

## APPENDICES

### Appendix-A

### Questionnaire for Fishermen

#### 1. General Information:

1.1 Name:

1.2 Father's/ Husband Name:

1.3. Address:

1.4 Category of fisher person

1=Full time, 2=part time, 3=occasional

#### 2. Socio Economic Information

| Age | Family size | Gender<br>Male- 1<br>Female-2 | Marital status<br>Married-1<br>unmarried-2<br>widow-3 divorsy-4 | Education<br>Can sign and count<br>-1<br>1-5 years school-2<br>6-10 years of school<br>-3 SSC & above-4 | Alternate Occupation<br>1-Agriculture<br>2-Business<br>3-Daily labor<br>4-Others (specify) | Annual Income (Tk) |
|-----|-------------|-------------------------------|-----------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|--------------------|
|-----|-------------|-------------------------------|-----------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|--------------------|

#### 3. Crafts & Gears:

3.1 Water transports and uses:

| Sl No | Type of transport | Size (m) | Use <sup>1</sup> | Duration of use (month <sup>2</sup> ) | Number of personnel engaged |
|-------|-------------------|----------|------------------|---------------------------------------|-----------------------------|
|-------|-------------------|----------|------------------|---------------------------------------|-----------------------------|

<sup>1</sup>Type of use: 1=fishing, 2=carrying passengers as business, 3=carrying goods as business, 4= own goods and family members carrying 2Please mention the name of months

3.2 What types of gear used for fishing in Chalan *beel*?

3.3 Which fish generally caught in those types of gears?

| Sl No | Gear Type | Material used | Dimension & Using techniques | Fish species |
|-------|-----------|---------------|------------------------------|--------------|
|-------|-----------|---------------|------------------------------|--------------|

#### 4. Fishing:

4.1 Which fishing points covered?

4.2 How many times you engaged in fishing per 24 hours?

4.3 Fishing season (Please mention the months)

| Pick season | Less pick season | Off season |
|-------------|------------------|------------|
|-------------|------------------|------------|

4.4 What is-your work during off season (when no water existed everywhere)?

1= farming agriculture, 2=business, 3=nothing did, 4=day labor 5=others (specify)

4.5 Which amount fish you caught per day?

4.6 How many days you engaged in fishing in a season?

4.7 Which month's water existed everywhere?

4.8 Which months were most favorable for fishing?

4.9 Which fishes are mostly available now in this area?

4.10 Which fishes are mostly rare now in this area?

4.11 What type of change in quantity of your catching fish have you observed during the last 5 years? 1=same, 2=decreasing, 3=increasing

If quantity is decreased please mention the reason you think.

4.12 In your opinion, how can the quantities of fish be increase in Chalan *beel* area ?

4.13 What are the problems you face in marketing of fish?

4.14 What types of problems do you face in catching fish from the *beel*?

4.15 Which fish species are not found considerably now-days in your area? (Mention 5 species)

**Signature**

## Questionnaire for Fish Farmer

**1. General Information:**

1.1 Name: \_\_\_\_\_ 1.2 Father's/ Husband Name: \_\_\_\_\_ 1.3. Address: \_\_\_\_\_

**2. Pond ownership type:**

**Ownership Code:** Single -1, Multiple -2, Leased -3 ☐

Lease period (years) : ☐ Lease cost (Tk/year): \_\_\_\_\_

**3. Pond type**

Perrenial-1, Seasonal-2 ☐

**4. Pond Characteristics:**

4.1 Area of the Pond (decimal) ☐ Water area: ☐ Dyke area: \_\_\_\_\_

4.2 Average Depth of the Pond (ft) ☐ 4.3 Age of the Pond (years): ☐

4.4 Soil Type Loamy -1, Clay -2, Red-3, Sandy-4, and Sandy-loam-5 ☐

**5. Fish culture:**

5.1 Experience of fish culture (Year): ☐

5.2 Source of fry ☐

1=wild fish stock, 2=fingerling stock from external sources, 3=wild & fingerling both.

5.3 Please mention the Fish culture period (days and name of months)

5.4 Did you fish culture in the previous year (2007) Yes-1, No-2

If yes, what were the species cultured (Please use tick and mention the numbers)

Catla..... Bighead carp..... Silver carp..... Telapia.....

Rui..... Grass carp..... Raj puti..... Thai pangus.....

Mrigal..... Kalibaus..... Carpio..... Others.....

5.5 What was the source of fingerlings? 1=hatchery, 2=river, 3=beel ☐

24.6 Did you use supplementary feed (oil cake, rice bran etc.)? ☐

1=always used, 2=sometimes used, 3= never used

5.7 Did you use all the fish culture inputs (Lime, urea, TSP, cow dung, poultry droppings etc.)? 1=always used, 2=sometimes used, 3= never used ☐

5.8 Please mention the amount of fish prod. in 2007. .... .Kg

5.9 Please mention the fish culture cost 2007. Tk .....

5.10 Please mention the income from fish culture Tk .....

5.11. Have you received any training about fish culture? Yes-1, No-2 ☐

5.11. Are you happy with present production? 1= Very 2= moderately 3= Unhappy ☐

**6. What is your alternative occupation?**

**Signature of Data Enumerator**

**Date**

## Questionnaire for Key informant

Name of UFO:

Upazilla:

|   |                                                                                                                     |                                                              |
|---|---------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------|
| 1 | No of Union:                                                                                                        |                                                              |
|   | Inside CB:                                                                                                          | Outside CB:                                                  |
| 2 | Area                                                                                                                |                                                              |
|   | Inside CB:                                                                                                          | Outside CB:                                                  |
| 3 | Population:                                                                                                         |                                                              |
|   | Inside CB:                                                                                                          | Outside CB:                                                  |
| 4 | No of Village:                                                                                                      |                                                              |
|   | Inside CB:                                                                                                          | Outside CB:                                                  |
| 5 | Literacy rate (%):                                                                                                  |                                                              |
| 6 | No of River(s):                                                                                                     | Name of the river(s):                                        |
| 7 | No of Beel(s):                                                                                                      | Name of Beel(s):                                             |
| 8 | Fish Culture in Chalan <i>Beel</i> :<br>Total No of Pond:<br>Total No of Boropit:<br>Types of Culture, Polyculture- | Area of Pond (dec):<br>Area of Boropit (dec)<br>Monoculture- |

- Name the species used for fish culture-
- What is the major source of fingerling with (%) for fish culture?  
River-                      *Beel*-                      Hatchery-
- Which technologies are popular for fish culture in Chalan *beel* area (list chronologically)?
- Which inputs are used for fish culture?
- Mention the chemicals and pesticides with doses used in fish culture-

| Trade name | Chemical name | Mode of use | Price | Rec. dose | Used dose | Source | Season | Import channel |
|------------|---------------|-------------|-------|-----------|-----------|--------|--------|----------------|
|            |               |             |       |           |           |        |        |                |
|            |               |             |       |           |           |        |        |                |
|            |               |             |       |           |           |        |        |                |

- Purpose of pesticides/chemicals use-
- Have you heard/faced any incidents due to use of pesticides and chemicals (if any, please mention number and loss kg and Tk.)
- Severe-      No.              Loss (kg)-                      Loss (Tk)-
- Moderate-      No.              Loss (kg)-                      Loss (Tk)-
- Minor              No.              Loss (kg)-                      Loss (Tk)-

- Generally, which people are involved in fish culture?  
Local elites-                      youths-                      professional fish culturist-                      others-
- Culture –wise production per decimal  
Polyculture-                      Monoculture-                      rice fish-                      cage culture-

9. Total fish production from different waterbodies:

|                                    |                                   |
|------------------------------------|-----------------------------------|
| Total aquaculture production (kg): | Total Open water production (kg): |
| Total beel production (kg):        | Total river production (kg):      |
| Total floodplain production (kg):  |                                   |

9. Please mention the name of destructive gears (no.) used in the chalan *beel*?

10. Please mention the number and name of the NGO concerned with fisheries activities

11. Number of fisheries cooperative society with member:

12. Please mention the name and number of different institutions-

13. Effect of infrastructure on the fishery:

## Questionnaire for Crop Farmer

**1. General Information:**

1.1 Name:                      1.2 Father's/ Husband Name:                      1.3. Address:

**3. Land owned by the household:**

Crop Land (decimal) –                      Homestead (decimal) –  
Leased land (decimal) -                      Pond area (decimal)-

**4. Farming:**

4.1 Farming experience (Year)                      4.2 cropping pattern: (1/2/3crop in a year)  
4.3 Variety used (rice, wheat & other major crops):                      4.4 Aquaculture

**5. Which methods do you use to control pests? Pesticide/IPM/Resist.Varieties/No ans.**

5.1 Do you use Pesticide/chemicals/Fertilizers in your lands? If, yes

5.1.1 Particulars of usages of pesticides/chemicals/Fertilizers for crop farming and aquaculture?

| Sl. No. | Name of pesticides/chemicals/Fertilizer | Dose | Season | Days after planting | Name of Crop | Freq/ Yr |
|---------|-----------------------------------------|------|--------|---------------------|--------------|----------|
| 1       | 2                                       | 3    | 4      | 5                   | 6            | 7        |

5.2 Where did you learn how to use the pesticide? From DAE/farmers/pesticide shop or dealer/retailer/No. answers

5.3 How often do you see extension workers (times/yr)?

5.4 Any problems related to important pesticides? Cost of pesticides/Health effects/Environment effects/No. answers

5.4.1 Pesticides have harmful effect and kill beneficial insects and microorganism/ Reduce fish biodiversity/ birds/agro-bio diversity/soil fertility.

5.4.2 Pesticides have harmful effect

5.4.3 Pesticides do not have harmful effect

5.4.1 Have pesticides been a problem for your health? Yes/No/Don't know/No. ans.

5.4.2 What Kind of health problem from pesticides spraying? Get tired/Feel hot and itchy/Feel dizzy/Get headache/No. answers.

5.4.3 Which pesticides are problems for your health? Inse. /herb./ fung./No. ans.

5.4.4 Do you use any protection when spraying?

**6.** Can pesticides have a negative effect on the yield? Yes/No/Do not know/ No. answers

**7.** If, yes, Why? Pesticides are toxic to fish/Natural feed for the fish decrease/Fish growth decrease/No. answers

**8.** Do you apply IPM? If, yes, give example) No insecticides the first forty days/ Adjust pesticide use to pest infestation/ Limit pesticide use/ No. answers

**9.** Would you like to start with IPM? Yes/No// No. answers

**10.** Reasons for applying start with IPM? Lower cost/ Protect health/ protect the environment/No. answers

Enumerator

Date

## Questionnaire for Pesticide Dealer

**1. General Information:**

1.1 Name:

1.2 Father's/ Husband Name:

1.3. Address:

**2. Socio Economic Information**

| Age | Family size | Gender<br>Male- 1<br>Female-2 | Marital status<br>Married-1<br>unmarried-2<br>widow-3<br>divorsy-4 | Education<br>Can sign and count -1<br>1-5 years school-2<br>6-10 years of school -<br>3 SSC & above-4 | Annual Income (Tk) |
|-----|-------------|-------------------------------|--------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------|--------------------|
|     |             |                               |                                                                    |                                                                                                       |                    |
|     |             |                               |                                                                    |                                                                                                       |                    |

**3. Business Experience (Year):****4. Pesticide:**

4.1 Number of pesticide sold in the previous year (2007):

4.2 Important pesticides (10):

| Trade name | Chemical name | Mode of use | Price | Rec. dose | Used dose | Source | Season | Import channel |
|------------|---------------|-------------|-------|-----------|-----------|--------|--------|----------------|
|            |               |             |       |           |           |        |        |                |

4.3 Amount and monetary value of pesticide:

| 2006        |           | 2007        |           | 2008        |           |
|-------------|-----------|-------------|-----------|-------------|-----------|
| Amount (kg) | Cost (Tk) | Amount (kg) | Cost (Tk) | Amount (kg) | Cost (Tk) |
|             |           |             |           |             |           |

4.4 Pesticide selling:

| Most selling months | Less selling months |
|---------------------|---------------------|
|                     |                     |

**Signature of Data Enumerator****Date**

## Questionnaire for key informant

Name of UAO:

Upazila:

1. Please mention important pesticides:

| Trade name | Chemical name | Mode of use | Price | Rec. dose | Used dose | Source | Season | Import channel |
|------------|---------------|-------------|-------|-----------|-----------|--------|--------|----------------|
|            |               |             |       |           |           |        |        |                |

2. Mention the name and amount of various chemical fertilizers used in the year 2007 and 2008:

3. Amount and monetary value of pesticide:

| 2004        |           | 2005        |           | 2006        |           | 2007        |           | 2008        |           |
|-------------|-----------|-------------|-----------|-------------|-----------|-------------|-----------|-------------|-----------|
| Amount (kg) | Cost (Tk) | Amount (kg) | Cost (Tk) | Amount (kg) | Cost (Tk) | Amount (kg) | Cost (Tk) | Amount (kg) | Cost (Tk) |
|             |           |             |           |             |           |             |           |             |           |

4. What are the harmful effects of pesticide (Please few words)?

|                |  |          |  |
|----------------|--|----------|--|
| On Fish        |  | On Bird  |  |
| On Agriculture |  | On Human |  |
| On environment |  |          |  |

|    |                                         |  |                                  |  |
|----|-----------------------------------------|--|----------------------------------|--|
| 5. | Area of crop land (ha):                 |  |                                  |  |
| 6. | Cropping-pattern:                       |  |                                  |  |
| 7. | Number of farmers:<br>Marginal farmers- |  | Small farmers-<br>Large farmers- |  |
| 8. | Important rice variety:                 |  |                                  |  |
| 9. | Important agriculture product:          |  |                                  |  |

| Cereal Crop | Pulse | Spice | Vegetables | Others |
|-------------|-------|-------|------------|--------|
|             |       |       |            |        |

Enumerator:

Date:

## Appendix-G

### Catch Assessment Survey sheet

| Ref No. | Site No. | Location | Date | Recorder |
|---------|----------|----------|------|----------|
|---------|----------|----------|------|----------|

1. Name and address of the Fisherman:
2. Amount of catch:
3. Amount of sample:
4. Duration of Fishing:
5. No. of fishing days in a week in this site:
6. Species-wise weight of fishes:

| Common name | Code | No. of fish | Weight(g) | Comments |
|-------------|------|-------------|-----------|----------|
|             |      |             |           |          |

### FISHING EFFORT SURVEY SHEET

|           |                                        |          |          |          |          |          |         |
|-----------|----------------------------------------|----------|----------|----------|----------|----------|---------|
| Ref No.   | Site No.                               | Location | Date     |          |          | Recorder |         |
| Gear type | Recorded numbers during sampling times |          |          |          |          |          | Remarks |
| Name      | 6-8 am                                 | 8-10 am  | 10-12 am | 12-14 pm | 14-16 pm | 16-8pm   |         |
|           |                                        |          |          |          |          |          |         |

### QUESTIONNAIRE FOR GEAR SURVEY

1. Name:
2. Address:
3. Description of the gear:

| Name of the gear | L×W×H & materials used | Making cost/Piece | Fish species and amt. per day | Used month | Remarks |
|------------------|------------------------|-------------------|-------------------------------|------------|---------|
|------------------|------------------------|-------------------|-------------------------------|------------|---------|

### SPECIES CHECK LIST

| Code | Species                                 | Code | Species                      |
|------|-----------------------------------------|------|------------------------------|
| 201  | <i>Anguilla bengalensis bengalensis</i> | 217  | <i>Amblypharyngodon mola</i> |
| 202  | <i>Congresox talabon</i>                | 218  | <i>Aspidoparia jaya</i>      |
| 203  | <i>Pisodonophis boro</i>                | 219  | <i>Aspidoparia morar</i>     |
| 204  | <i>Chitala chitala</i>                  | 220  | <i>Chagunius chagunio</i>    |
| 205  | <i>Notopterus notopterus</i>            | 221  | <i>Chela cachius</i>         |
| 206  | <i>Gonialosa manmina</i>                | 222  | <i>Chela laubuca</i>         |
| 207  | <i>Gudusia chapra</i>                   | 223  | <i>Rasbora daniconius</i>    |
| 208  | <i>Tenuulosa ilisha</i>                 | 224  | <i>Megarasbora elanga</i>    |
| 209  | <i>Setipinna phasa</i>                  | 225  | <i>Catla catla</i>           |
| 210  | <i>Setipinna taty</i>                   | 226  | <i>Cirrhinus cirrhosus</i>   |
| 211  | <i>Acanthocobitis botia</i>             | 227  | <i>Labeo ariza</i>           |
| 212  | <i>Botia dario</i>                      | 228  | <i>Labeo bata</i>            |
| 213  | <i>Botia dayi</i>                       | 229  | <i>Labeo boga</i>            |
| 214  | <i>Botia lohachata</i>                  | 230  | <i>Labeo calbasu</i>         |
| 215  | <i>Botia rostrata</i>                   | 231  | <i>Labeo gonius</i>          |
| 216  | <i>Lepidocephalichthys guntea</i>       | 232  | <i>Labeo rohita</i>          |

(Cont'd)

| Code | Species                                 | Code | Species                         |
|------|-----------------------------------------|------|---------------------------------|
| 233  | <i>Somileptus gongota</i>               | 274  | <i>Batasio batasio</i>          |
| 234  | <i>Salmostoma acinaces</i>              | 275  | <i>Batasio tengana</i>          |
| 235  | <i>Salmostoma bacaila</i>               | 276  | <i>Hemibagrus menoda</i>        |
| 236  | <i>Salmostoma phulo</i>                 | 277  | <i>Mystus armatus</i>           |
| 237  | <i>Securicula gora</i>                  | 278  | <i>Mystus bleekeri</i>          |
| 238  | <i>Danio rerio</i>                      | 279  | <i>Mystus cavasius</i>          |
| 239  | <i>Esomus danricus</i>                  | 280  | <i>Mystus tengara</i>           |
| 240  | <i>Mystus vittatus</i>                  | 281  | <i>Puntius conchoni</i>         |
| 241  | <i>Rama chandramara</i>                 | 282  | <i>Puntius gelius</i>           |
| 242  | <i>Rita rita</i>                        | 283  | <i>Puntius phutunio</i>         |
| 243  | <i>Sperata aor</i>                      | 284  | <i>Puntius sarana</i>           |
| 244  | <i>Sperata seenghala</i>                | 285  | <i>Puntius sophore</i>          |
| 245  | <i>Chaca chaca</i>                      | 286  | <i>Puntius ticto</i>            |
| 246  | <i>Clarias batrachus</i>                | 287  | <i>Poropuntius clavatus</i>     |
| 247  | <i>Heteropneustes fossilis</i>          | 288  | <i>Raiamas bola</i>             |
| 248  | <i>Pangasius pangasius</i>              | 289  | <i>Psilorhynchus sucatio</i>    |
| 249  | <i>Ailia coila</i>                      | 290  | <i>Conta conta</i>              |
| 250  | <i>Ailichthys punctata</i>              | 291  | <i>Erethistes hara</i>          |
| 251  | <i>Clupisoma garua</i>                  | 292  | <i>Erethistes jerdoni</i>       |
| 252  | <i>Eutropiichthys vacha</i>             | 293  | <i>Erethistoides infuscatus</i> |
| 253  | <i>Neotropius atherinoides</i>          | 294  | <i>Pseudolaguvia shawi</i>      |
| 254  | <i>Silonia silondia</i>                 | 295  | <i>Pseudolaguvia inornata</i>   |
| 255  | <i>Ompok bimaculatus</i>                | 296  | <i>Pseudolaguvia murikata</i>   |
| 256  | <i>Ompok pabda</i>                      | 297  | <i>Pseudambassis baculis</i>    |
| 257  | <i>Ompok pabo</i>                       | 298  | <i>Anabas testudineus</i>       |
| 258  | <i>Wallago attu</i>                     | 299  | <i>Badis badis</i>              |
| 259  | <i>Bagarius bagarius</i>                | 300  | <i>Channa gachua</i>            |
| 260  | <i>Gagata cenia</i>                     | 301  | <i>Channa marulius</i>          |
| 261  | <i>Gagata gagata</i>                    | 302  | <i>Channa punctata</i>          |
| 262  | <i>Gagata youssoufi</i>                 | 303  | <i>Channa striata</i>           |
| 263  | <i>Gogangra viridescens</i>             | 304  | <i>Glossogobius giuris</i>      |
| 264  | <i>Parachilognathus hodgarti</i>        | 305  | <i>Rhinomugil corsula</i>       |
| 265  | <i>Aplocheilichthys panchax panchax</i> | 306  | <i>Sicamugil cascasia</i>       |
| 266  | <i>Monopterus albus</i>                 | 307  | <i>Nandus nandus</i>            |
| 267  | <i>Mastacembelus armatus</i>            | 308  | <i>Colisa lalia</i>             |
| 268  | <i>Macrhnathus aculeatus</i>            | 309  | <i>Polyacanthus fasciatus</i>   |
| 269  | <i>Macrhnathus pancalus</i>             | 310  | <i>Trichogaster chuna</i>       |
| 270  | <i>Chanda nama</i>                      | 311  | <i>Xenentodon cancila</i>       |
| 271  | <i>Parambassis ranga</i>                | 312  | <i>Hyporhamphus limbatus</i>    |
| 272  | <i>Osteobrama cotio cotio</i>           | 313  | <i>Chelonodon patoca</i>        |
| 273  | <i>Puntius chola</i>                    | 314  | <i>Tetraodon cutcutia</i>       |

## Appendix-H

### Water and sediment quality parameters sampling sheet:

For the month of

Date:

#### Water quality parameters

| Sl no. | Parameters                   | S <sub>1</sub> | S <sub>2</sub> | S <sub>3</sub> | Remarks |
|--------|------------------------------|----------------|----------------|----------------|---------|
| 1.     | Water depth (cm)             |                |                |                | Monthly |
| 2.     | Temperature (°C)             |                |                |                |         |
| 3.     | Transparency (cm)            |                |                |                |         |
| 4.     | p <sup>H</sup>               |                |                |                |         |
| 5.     | Alkalinity                   |                |                |                |         |
| 6.     | Conductivity(COND)           |                |                |                |         |
| 7.     | Total suspended solids(TDS)  |                |                |                |         |
| 8.     | Nitrate (NO <sub>3</sub> )   |                |                |                |         |
| 9.     | Ammonia (NH <sub>3</sub> )   |                |                |                |         |
| 10.    | Phosphate (PO <sub>4</sub> ) |                |                |                |         |

#### Sediment quality parameters

| Sl no. | Name of elements      | S <sub>1</sub> | S <sub>2</sub> | S <sub>3</sub> | Remarks   |
|--------|-----------------------|----------------|----------------|----------------|-----------|
| 1.     | Soil pH (SPH)         |                |                |                | Quarterly |
| 2.     | Organic matter (%)    |                |                |                |           |
| 3.     | Potassium (Ex-K)      |                |                |                |           |
| 4.     | Total Nitrogen-TN (%) |                |                |                |           |
| 5.     | Available phosphorus  |                |                |                |           |