

**Appendix: I**  
**MPN/100 ml [For 3 tubes]**  
**Bacteriological Report**

**Table: 10 - 1 - 0.1**

| Number of Positive Tubes |      |       | MPN/100 ml |
|--------------------------|------|-------|------------|
| 10 ml                    | 1 ml | 0.1ml |            |
| 0                        | 0    | 0     | x          |
| 0                        | 0    | 1     | 3          |
| 0                        | 0    | 2     | 6          |
| 0                        | 0    | 3     | 9          |
| 0                        | 1    | 0     | 3          |
| 0                        | 1    | 1     | 6.1 (7)    |
| 0                        | 1    | 2     | 9.2 (10)   |
| 0                        | 1    | 3     | 12         |
| 0                        | 2    | 0     | 6.2 (7)    |
| 0                        | 2    | 1     | 9.3 (10)   |
| 0                        | 2    | 2     | 12         |
| 0                        | 2    | 3     | 16         |
| 0                        | 3    | 0     | 9.4 (10)   |
| 0                        | 3    | 1     | 13         |
| 0                        | 3    | 2     | 16         |
| 0                        | 3    | 3     | 19         |
| 1                        | 0    | 0     | 3.6        |
| 1                        | 0    | 1     | 7.2        |
| 1                        | 0    | 2     | 11         |
| 1                        | 0    | 3     | 15         |
| 1                        | 1    | 0     | 7.3        |
| 1                        | 1    | 1     | 11         |
| 1                        | 1    | 2     | 15         |
| 1                        | 1    | 3     | 19         |
| 1                        | 2    | 0     | 11         |
| 1                        | 2    | 1     | 15         |
| 1                        | 2    | 2     | 20         |
| 1                        | 2    | 3     | 24         |
| 1                        | 3    | 0     | 16         |
| 1                        | 3    | 1     | 20         |
| 1                        | 3    | 2     | 24         |
| 1                        | 3    | 3     | 29         |
| 2                        | 0    | 0     | 9.1        |
| 2                        | 0    | 1     | 14         |
| 2                        | 0    | 2     | 20         |
| 2                        | 0    | 3     | 26         |

| Number of Positive Tubes |      |       | MPN/100 ml |
|--------------------------|------|-------|------------|
| 10 ml                    | 1 ml | 0.1ml |            |
| 2                        | 1    | 0     | 15         |
| 2                        | 1    | 1     | 20         |
| 2                        | 1    | 2     | 27         |
| 2                        | 1    | 3     | 34         |
| 2                        | 2    | 0     | 21         |
| 2                        | 2    | 1     | 28         |
| 2                        | 2    | 2     | 35         |
| 2                        | 2    | 3     | 42         |
| 2                        | 3    | 0     | 29         |
| 2                        | 3    | 1     | 36         |
| 2                        | 3    | 2     | 44         |
| 2                        | 3    | 3     | 53         |
| 3                        | 0    | 0     | 23         |
| 3                        | 0    | 1     | 39         |
| 3                        | 0    | 2     | 64         |
| 3                        | 0    | 3     | 95         |
| 3                        | 1    | 0     | 43         |
| 3                        | 1    | 1     | 75         |
| 3                        | 1    | 2     | 120        |
| 3                        | 1    | 3     | 160        |
| 3                        | 2    | 0     | 93         |
| 3                        | 2    | 1     | 150        |
| 3                        | 2    | 2     | 210        |
| 3                        | 2    | 3     | 290        |
| 3                        | 3    | 0     | 240        |
| 3                        | 3    | 1     | 460        |
| 3                        | 3    | 2     | 1100       |
| 3                        | 3    | 3     | 2400       |

| Source                    | Strength                    | Result       |
|---------------------------|-----------------------------|--------------|
| For low polluted water    | 1 – 0.1 – 0.01              | MPN X 10     |
| For polluted river water  | 0.1 – 0.01 – 0.001          | MPN X 100    |
| For highly polluted water | 0.01 – 0.001 – 0.0001       | MPN X 1000   |
| For aerated sewage        | 0.001 – 0.0001 – 0.00001    | MPN X 10000  |
| For raw sewage            | 0.0001 – 0.00001 – 0.000001 | MPN X 100000 |

**Appendix: II**  
**SOCIO-ECONOMIC STUDY OF WETLAND**

**NAME OF RESPONDENT:** \_\_\_\_\_ **AGE:** \_\_\_\_\_

**M/F** \_\_\_\_\_

**DATE:** \_\_\_\_\_

**VILLAGE:** \_\_\_\_\_

**1. DEMOGRAPHIC INFORMATION**

Total number of person in households: \_\_\_\_

a) Age 0-15 Years: \_\_\_\_ Age 16-25 Years: \_\_\_\_ Age 26-50 Years: \_\_\_\_

Age50+ Years: \_\_\_\_

b) Caste:

c) Occupation(s) of household members:

| <b>CULTIVATOR</b> | <b>LABOURER</b> | <b>SERVICE</b> | <b>OTHERS</b> |
|-------------------|-----------------|----------------|---------------|
|                   |                 |                |               |

d) Total household income (Rs./yr)

e) How long have you/your family lived in this village/area?

\_\_\_\_\_years

f) Has the primary occupation of your family changed in the past 30 years?

(Yes/No)

If Yes, how?

## 2. WETLAND DEPENDANCE

Names of the Wetlands(s) Used:

a) **Types of Uses:** Fishing/ Aquaculture/ Irrigation/ Washing/

Bathing/Drinking/

Collection of Resources: Fodder/Vegetable/Medicinal Plants

b) **Fishing Activity**

| Group      | Percentage | Income/Person/Month (Rs.) |
|------------|------------|---------------------------|
| Domestic   |            |                           |
| Commercial |            |                           |

c) Have you noticed a change in the number or size of the farmed or beel fish?

Number (Decline/Increase/Same/Don't Know)

Size (Decline/Increase/Same/Don't Know)

d) Have different types of beel fish become more or less common?

(Yes/No/Don't Know)

If so which type?

e) Water filter use? (Yes/No)

Has the consumption of water over the decades has affected the health of the villagers?

If yes, How?

f) **Spiritual Value**

i) Does the wetland play a role in religious practices?

(Yes/No/Don't Know)

- ii) Submersion of Idols (eg. Saraswati Pratima)? (Yes/No/Don't Know)

**3. WETLAND INFORMATION:**

(a) Area:

(b) Perennial/Seasonal:

(c) Distance from the Beel:

(d) Have you witnessed the quality of the water in the lake change? (Yes/No)

If Yes, For how long? \_\_\_\_\_

(e) How has this affected your Day-today-work/Lifestyle?

(f) Has the Fishery Department taken any kind of initiatives for the restoration of the Beel? (Yes/No/Don't Know)

(g) **Lease Period, if any**

(i) Is the Beel taken on lease? (Yes/No)

(ii) If Yes, duration of time?

(h) Have you observed any decline in the quantity of fish due to the beel taken on lease

(Yes/No)

(i) **Agriculture**

i) Do the villagers use the place in and around the wetland for agriculture/vegetable?

Yes/No

If Yes, which season (Pre Monsoon, Post Monsoon)

Type of paddy/vegetables?

ii) Do the villagers use chemical/organic fertilizers for farming?

(Yes/No)

How has the use of fertilizers affected the wetland?

**(j) Other Commercial Uses (Cottage Industries)**

| <b>Activity</b> | <b>Water Usage</b> | <b>Income (Rs.)</b> |
|-----------------|--------------------|---------------------|
|                 |                    |                     |

**4. MANAGEMENT OF THE WETLAND**

**a) Community Involvement In Restoration**

- i) Would you like your children to remain here and continue using the wetland?

(Yes/No/Don't Know)

- ii) Would you be like to be willing to assist a plan to rehabilitate the wetland?

(Yes/No)

**b) Aesthetic Value/Recreation**

- i) Are you concerned about a decline in the aesthetic value of the wetland (Sight/Smell)?

(Yes/No)

- ii) Has this decline prevented you from enjoying the traditional activities around the wetland?

(Yes/No/Don't know)

**c) Waterfowl/Birds**

- i) Have you noticed any change in overall number of birds?

(Decline/Increase/same/Don't Know)

ii) Have different types of birds become more or less common?

(Yes/No)

If Yes, Which type?

-oOo-

### Appendix - III

#### Seasonal mean, Overall Mean and Standard Deviation of Chemical Water Quality Parameters (2013 & 2014)

| Parameter                   | Season        | Type of Wetland (Name)              |                      |                        |                           |
|-----------------------------|---------------|-------------------------------------|----------------------|------------------------|---------------------------|
|                             |               | Riverine<br>(Bordoibam<br>Beelmukh) | Oxbow<br>(Bukrong)   | Lake/Pond<br>(Borbeel) | Waterlogged<br>(Kilakili) |
| pH                          | Pre-monsoon   | 6.75                                | 6.63                 | 6.59                   | 6.93                      |
|                             | Monsoon       | 6.80                                | 6.72                 | 6.50                   | 6.87                      |
|                             | Autumn        | 6.76                                | 6.75                 | 6.20                   | 7.00                      |
|                             | Post- Monsoon | 6.90                                | 7.20                 | 6.86                   | 6.93                      |
|                             | <b>Mean</b>   | <b>6.755±0.068</b>                  | <b>6.81±0.255</b>    | <b>6.60±0.282</b>      | <b>6.87±0.053</b>         |
| Alkalinity(mg/litre)        | Pre-monsoon   | 101.42                              | 90.00                | 98.75                  | 90.00                     |
|                             | Monsoon       | 101.42                              | 90.00                | 98.75                  | 90.00                     |
|                             | Autumn        | 137.17                              | 137.50               | 127.00                 | 133.75                    |
|                             | Post- Monsoon | 76.67                               | 82.85                | 89.56                  | 76.00                     |
|                             | <b>Mean</b>   | <b>107.71±25.38</b>                 | <b>104.12±24.28</b>  | <b>105.57±15.95</b>    | <b>100.56±24.63</b>       |
| DO(mg/litre)                | Pre-monsoon   | 5.50                                | 4.00                 | 4.40                   | 6.50                      |
|                             | Monsoon       | 6.80                                | 5.20                 | 5.40                   | 7.20                      |
|                             | Autumn        | 5.70                                | 5.30                 | 5.10                   | 6.40                      |
|                             | Post- Monsoon | 5.60                                | 4.90                 | 4.20                   | 6.30                      |
|                             | <b>Mean</b>   | <b>5.8±0.686</b>                    | <b>5.0±0.358</b>     | <b>4.9±0.493</b>       | <b>6.7±0.368</b>          |
| TDS (mg/litre)              | Pre-monsoon   | 228.83                              | 220.00               | 161.13                 | 179.00                    |
|                             | Monsoon       | 143.57                              | 151.50               | 138.50                 | 120.00                    |
|                             | Autumn        | 184.17                              | 176.25               | 218.50                 | 188.75                    |
|                             | Post- Monsoon | 243.27                              | 191.78               | 219.12                 | 206.00                    |
|                             | <b>Mean</b>   | <b>199.95±45.23</b>                 | <b>184.88±28.69</b>  | <b>209.31±80.32</b>    | <b>173.43±37.33</b>       |
| EC (µS/cm)                  | Pre-monsoon   | 686.67                              | 673.13               | 590.75                 | 555.13                    |
|                             | Monsoon       | 325.71                              | 372.50               | 300.00                 | 292.50                    |
|                             | Autumn        | 310.00                              | 302.00               | 432.00                 | 321.00                    |
|                             | Post- Monsoon | 466.00                              | 330.44               | 411.25                 | 438.68                    |
|                             | <b>Mean</b>   | <b>447.09±174.43</b>                | <b>419.52±171.54</b> | <b>433.5±119.78</b>    | <b>401.82±120.20</b>      |
| Total<br>Hardness(mg/litre) | Pre-monsoon   | 60.58                               | 64.88                | 67.60                  | 81.50                     |
|                             | Monsoon       | 77.14                               | 81.00                | 64.50                  | 81.00                     |
|                             | Autumn        | 66.33                               | 69.00                | 71.38                  | 84.00                     |
|                             | Post- Monsoon | 83.00                               | 67.00                | 71.50                  | 84.50                     |
|                             | <b>Mean</b>   | <b>71.76±10.16</b>                  | <b>70.47±7.21</b>    | <b>68.74±3.35</b>      | <b>82.75±1.75</b>         |



| Parameter  | Season        | Type of Wetland (Name)              |                    |                        |                           |
|--|---------------|-------------------------------------|--------------------|------------------------|---------------------------|
|  |               | Riverine<br>(Bordoibam<br>Beelmukh) | Oxbow<br>(Bukrong) | Lake/Pond<br>(Borbeel) | Waterlogged<br>(Kilakili) |
| Calcium(mg/litre)  | Pre-monsoon   | 43.32                               | 44.93              | 48.90                  | 60.83                     |
|  | Monsoon       | 54.57                               | 58.00              | 45.50                  | 57.50                     |
|  | Autumn        | 48.10                               | 46.30              | 51.38                  | 61.80                     |
|  | Post- Monsoon | 55.67                               | 47.34              | 54.50                  | 63.50                     |
|  | <b>Mean</b>   | <b>50.41±5.78</b>                   | <b>49.14±5.98</b>  | <b>50.06±3.81</b>      | <b>60.9±2.52</b>          |
| Magnesium(mg/litre)                                      | Pre-monsoon   | 17.26                               | 19.95              | 19.08                  | 27.57                     |
|  | Monsoon       | 22.57                               | 23.00              | 19.00                  | 23.50                     |
|  | Autumn        | 18.23                               | 22.70              | 20.00                  | 22.20                     |
|  | Post- Monsoon | 27.33                               | 19.67              | 17.00                  | 28.22                     |
|  | <b>Mean</b>   | <b>21.34±4.60</b>                   | <b>21.32±1.766</b> | <b>18.77±1.26</b>      | <b>25.37±2.97</b>         |
| Potassium(mg/litre)                                      | Pre-monsoon   | 7.04                                | 9.14               | 1.78                   | 3.85                      |
|  | Monsoon       | 6.68                                | 8.86               | 1.72                   | 3.97                      |
|  | Autumn        | 7.90                                | 9.89               | 2.28                   | 3.79                      |
|  | Post- Monsoon | 6.21                                | 11.58              | 2.13                   | 3.43                      |
|  | <b>Mean</b>   | <b>6.95±0.716</b>                   | <b>9.86±1.22</b>   | <b>1.97±0.269</b>      | <b>3.75±0.229</b>         |
| BOD(mg/litre)  | Pre-monsoon   | 5.50                                | 7.25               | 11.20                  | 2.75                      |
|  | Monsoon       | 4.85                                | 7.30               | 10.35                  | 2.47                      |
|  | Autumn        | 4.67                                | 9.33               | 13.33                  | 2.23                      |
|  | Post- Monsoon | 7.00                                | 11.33              | 12.75                  | 4.30                      |
|  | <b>Mean</b>   | <b>5.28±1.04</b>                    | <b>9.12±2.01</b>   | <b>12.24±1.38</b>      | <b>2.89±1.04</b>          |
| COD(mg/litre)  | Pre-monsoon   | 12.08                               | 19.05              | 30.22                  | 6.05                      |
|  | Monsoon       | 10.51                               | 17.10              | 26.92                  | 6.05                      |
|  | Autumn        | 13.50                               | 21.43              | 35.53                  | 6.23                      |
|  | Post- Monsoon | 14.46                               | 23.80              | 36.70                  | 10.15                     |
|  | <b>Mean</b>   | <b>12.88±2.04</b>                   | <b>20.79±3.29</b>  | <b>32.79±4.76</b>      | <b>7.41±2.50</b>          |
| Phosphate (PO <sub>4</sub> <sup>3-</sup> )<br>(mg/litre) | Pre-monsoon   | 0.06                                | 0.10               | 0.16                   | 0.05                      |
|  | Monsoon       | 0.06                                | 0.09               | 0.05                   | 0.05                      |
|  | Autumn        | 0.07                                | 0.07               | 0.05                   | 0.05                      |
|  | Post- Monsoon | 0.08                                | 0.51               | 0.05                   | 0.05                      |
|  | <b>Mean</b>   | <b>0.068±0.009</b>                  | <b>0.193±0.208</b> | <b>0.075±0.056</b>     | <b>0.049±0.001</b>        |
| Nitrate (NO <sub>3</sub> <sup>2-</sup> )<br>(mg/litre)   | Pre-monsoon   | 2.61                                | 3.36               | 3.36                   | 2.17                      |
|  | Monsoon       | 1.82                                | 2.15               | 1.87                   | 2.47                      |
|  | Autumn        | 2.45                                | 3.38               | 2.95                   | 5.25                      |
|  | Post- Monsoon | 4.03                                | 3.08               | 4.36                   | 2.64                      |
|  | <b>Mean</b>   | <b>2.72±0.934</b>                   | <b>2.92±0.530</b>  | <b>3.13±1.03</b>       | <b>2.38±0.211</b>         |