APPENDIX - A

1. Ground Control Point (GCP) Collection			
ID	**Block**	**Location**	**GCP (Lat & Long)**
GPS-1	Contai-I	Dakshin charaikhia bridge	21° 48' 37" N 87° 38' 55" E
GPS-2		Contai centra bus stand	21° 46' 32" N 87° 44' 2" E
GPS-3		Soula sluice gate	21° 42' 3" N 87° 44' 57" E
GPS-4		Nimdasbar rail crossing	21° 43' 22" N 87° 39' 53" E
GPS-5		Dulalpur rail crossing	21° 46' 19" N 87° 40' 10" E
GPS-6	Desopran	Aladarput bridge	21° 44' 21" N 87° 47' 33" E
GPS-7		Gopalpur culvert	21° 44' 40" N 87° 50' 32" E
GPS-8		Petuaghat ferry ghat	21° 47' 48" N 87° 52' 48" E
GPS-9		Basantia High school	21° 48' 16" N 87° 48' 52" E
GPS-10		Amtolia more	21° 51' 42" N 87° 50' 15" E
GPS-11	Contai-III	Sarpai sluice gate	21° 54' 38" N 87° 43' 36" E
GPS-12		Kanaidighi culvert	21° 53' 57" N 87° 47' 45" E
GPS-13		Localbord bus stop	21° 50' 30" N 87° 45' 5" E
GPS-14		Bamunia culvert	21° 52' 37" N 87° 42' 6" E
GPS-15		Chadberia rail crossing	21° 47' 34" N 87° 44' 31" E
GPS-16	Ramnagar-II	Chata padmapur sluice gate	21° 46' 21" N 87° 36' 38" E
GPS-17		Hamirpur bridge	21° 43' 29" N 87° 32' 19" E
GPS-18		Dadanpatrabar more	21° 40' 31" N 87° 42' 1" E
GPS-19		Pichaboni bridge	21° 42' 29" N 87° 36' 44" E
GPS-20	Ramnagar-I	Badhia Bridge	21° 43' 39" N 87° 29' 17" E
GPS-21		Jhshateghori	21° 39' 54" N 87° 28' 34" E
GPS-22		Digha bypass	21° 37' 59" N 87° 31' 30" E
GPS-23		Sankarpur fish auction market	21° 38' 39" N 87° 34' 12" E
GPS-24		Chuddomile bridge	21° 40' 42" N 87° 34' 30" E

2. Soil Sampling Location				
Sample ID	**Block**	**Mouza**	**JL. No**	**GPS reading (Lat & Long)**
A	Contai-I	Dakshin sherpur	337	21° 42' 23" N 87° 44' 47" E
B		Nayaput	353	21° 43' 39" N 87° 45' 1" E
C		Rasulpur	565	21° 42' 32" N 87° 46' 35" E
D		Deshdatta bar	574	21° 43' 28" N 87° 46' 47" E
E	Desopran	Kanai chatta	632	21° 46' 37" N 87° 51' 59" E
F		Uttar amtalia	444	21° 51' 41" N 87° 50' 29" E
G		Kulanjara	418	21° 53' 28" N 87° 48' 31" E
H		Kumarberya	461	21° 49' 5" N 87° 48' 18" E
I	Contai-III	Kharipukuria	157	21° 53' 45" N 87° 45' 59" E
J		Sillibari	405	21° 52' 3" N 87° 45' 42" E
L		Haripur	162	21° 52' 9" N 87° 43' 13" E
M		Sukunia	153	21° 54' 43" N 87° 44' 18" E
N	Ramnagar-II	Kalindi	265	21° 40' 50" N 87° 40' 7" E
O		Sonamui	282	21° 40' 10" N 87° 41' 23" E
P		Purba-purushottampur	276	21° 41' 51" N 87° 42' 15" E
Q		Rania	283	21° 41' 20" N 87° 41' 24" E
R	Ramnagar-I	Somaibasan	90	21° 37' 44" N 87° 32' 11" E
S		Jashipur	228	21° 39' 35" N 87° 34' 23" E
T		Dublabari	240	21° 40' 8" N 87° 36' 22" E
U		Tajpur	244	21° 39' 6" N 87° 37' 51" E

3. Water (Shrimp pond) Sampling Location				
Sample ID	**Block**	**Mouza**	**JL. No**	**GPS reading (Lat & Long)**
C-1P1	Contai-I	Dakshin paikbar	574	21° 43' 34.038" N 87° 46' 49.908" E
C-1P2		Dakshin sherpur	337	21° 42' 23.417" N 87° 44' 42.986" E
C-1P3		Rasulpur	565	21° 42' 29.603" N 87° 46' 41.633" E
C-3P1	Contai-III	Bhaitgar	415	21° 54' 24.803" N 87° 46' 33.320" E
C-3P2		Kanaidighi	416	21° 54' 26.233" N 87° 48' 41.942" E
C-3P3		Tatka bar	143	21° 52' 12.479" N 87° 42' 20.572" E
DP1	Desopran	Kanai chatta	632	21° 46' 30.512" N 87° 51' 49.769" E
DP2		Kulanjara	418	21° 53' 27.822" N 87° 48' 27.995" E
DP3		Uttar amtalia	444	21° 51' 44.794" N 87° 50' 38.607" E
R-1P1	Ramnagar-I	Ghersai	88	21° 38' 5.749" N 87° 31' 40.826" E
R-1P2		Kuliyata	227	21° 39' 30.723" N 87° 34' 18.943" E
R-1P3		Talgachhari	108	21° 40' 14.301" N 87° 33' 38.502" E
R-2P1	Ramnagar-II	Baichibania	281	21° 40' 31.291" N 87° 40' 20.637" E
R-2P2		Deuli	248	21° 40' 37.861" N 87° 37' 39.913" E
R-2P3		Mania	285	21° 40' 57.555" N 87° 42' 7.864" E

4. Water (Tube-well) Sampling Location				
Sample ID	**Block**	**Mouza**	**JL. No**	**GPS reading (Lat & Long)**
C-1T1	Contai-I	Bachhipur bar	560	21° 43' 9.675" N 87° 46' 44.229" E
C-1T2		Baguran Jalpai	563	21° 42' 5.767" N 87° 46' 3.752" E
C-1T3		Purushottampur	341	21° 42' 30.865" N 87° 45' 2.400" E
C-3T1	Contai-III	Kanaidighi	416	21° 54' 50.706" N 87° 47' 4.535" E
C-3T2		Kharipukuria	157	21° 53' 17.761" N 87° 45' 35.939" E
C-3T3		Sarpal	150	21° 55' 2.887" N 87° 44' 19.018" E
DT1	Desopran	Amtalia	454	21° 51' 0.000" N 87° 50' 34.800" E
DT2		Daulatpur	513	21° 46' 23.700" N 87° 51' 13.799" E
DT3		Purba Rasulpur	448	21° 50' 23.500" N 87° 52' 11.252" E
R-1T1	Ramnagar-I	Digha	213	21° 38' 9.121" N 87° 34' 9.779" E
R-1T2		Gangadharpur	91	21° 37' 39.447" N 87° 32' 2.582" E
R-1T3		Shankarpur	224	21° 38' 47.760" N 87° 34' 21.540" E
R-2T1	Ramnagar-II	Dera	280	21° 41' 2.339" N 87° 40' 43.021" E
R-2T2		Deuli	248	21° 41' 2.940" N 87° 37' 44.159" E
R-2T3		Rania	283	21° 40' 35.704" N 87° 41' 59.299" E

5. Ground Truth Verification After Classification of the image of 2016					
GT	**GPS reading (Latitude & Longitude)**	**Ground Truth (2008)** By Public Consultation	**Ground Truth (2012)** By Public Consultation	**Ground Truth (2016)** By field observation	**Mismatch**
1	21° 37' 16.94"N 87° 29' 6.13"E	Sandy Area	Sandy Area	Settlement	
2	21° 42' 31.89"N 87° 28' 54.49"E	Vegetation Cover	Vegetation Cover	Vegetation Cover	
3	21° 38' 5.15"N 87° 31' 33.67"E	Bw Tanks/Ponds	Bw Tanks/Ponds	Bw Tanks/Ponds	
4	21° 40' 13.83"N 87° 33' 34.90"E	Bw Tanks/Ponds	Bw Tanks/Ponds	Bw Tanks/Ponds	
5	21° 43' 12.27"N 87° 33' 23.92"E	Settlement	Settlement	Settlement	
6	21° 53' 9.62"N 87° 45' 36.77"E	Agricultural land	Agricultural land	Bw Tanks/Ponds	
7	21° 38' 52.79"N 87° 31' 57.30"E	Agricultural land	Waterlogged Area	Waterlogged Area	*
8	21° 46' 27.13"N 87° 52' 27.17"E	Vegetation Cover	Vegetation Cover	Vegetation Cover	
9	21° 40' 30.41"N 87° 36' 16.02"E	Bw Tanks/Ponds	Bw Tanks/Ponds	Bw Tanks/Ponds	
10	21° 44' 54.73"N 87° 36' 2.65"E	Vegetation Cover	Vegetation Cover	Vegetation Cover	
11	21° 48' 29.96"N 87° 39' 7.56"E	Nayanjuli	Nayanjuli	Nayanjuli	
12	21° 43' 9.88"N 87° 48' 38.78"E	Fw Tanks/Ponds	Fw Tanks/Ponds	Fw Tanks/Ponds	
13	21° 40' 36.17"N 87° 43' 9.66"E	Bw Tanks/Ponds	Bw Tanks/Ponds	Bw Tanks/Ponds	
14	21° 53' 50.19"N 87° 49' 47.73"E	Agricultural land	Agricultural land	Bw Tanks/Ponds	
15	21° 46' 13.34"N 87° 51' 47.94"E	Nayanjuli	Nayanjuli	Bw Tanks/Ponds	
16	21° 48' 27.13"N 87° 48' 46.80"E	Fw Tanks/Ponds	Waterlogged Area	Fw Tanks/Ponds	*
17	21° 51' 51.12"N 87° 44' 9.4"E	Vegetation Cover	Vegetation Cover	Vegetation Cover	
18	21° 54' 22.12"N 87° 46' 54.30"E	Agricultural land	Agricultural land	Agricultural land	
19	21° 52' 36.21° "N 87° 49' 16.32"E	Agricultural land	Agricultural land	Bw Tanks/Ponds	
20	21° 51' 48.65"N 87° 51' 0.41"E	Settlement	Settlement	Settlement	
21	21° 46' 57.66"N 87° 47' 18.98"E	Sandy Area	Sandy Area	Settlement	*
22	21° 46' 22.79"N 87° 38' 6.05"E	Agricultural land	Agricultural land	Agricultural land	
23	21° 48' 35.51"N 87° 45' 16.39"E	Waterlogged Area	Waterlogged Area	Waterlogged Area	
24	21° 44' 3.43"N 87° 49' 41.93"E	Vegetation Cover	Vegetation Cover	Vegetation Cover	
25	21° 50' 9.07"N 87° 41' 48.71"E	Agricultural land	Agricultural land	Agricultural land	
26	21° 50' 53.98"N 87° 48' 2.88"E	Bw Tanks/Ponds	Bw Tanks/Ponds	Bw Tanks/Ponds	
27	21° 43' 0.22"N 87° 33' 27.95"E	Agricultural land	Agricultural land	Settlement	
28	21° 47' 38.21 "N 87° 52' 47.63"E	Settlement	Settlement	Settlement	
29	21° 47' 52.375"N 87° 49' 19.31"E	Agricultural land	Agricultural land	Agricultural land	
30	21° 47' 35.70"N 87° 45' 55.20"E	Settlement	Settlement	Settlement	
31	21° 44' 49.37"N 87° 42' 13.06"E	Waterlogged Area	Nayanjuli	Nayanjuli	*
32	21° 40' 1.19"N 87° 30' 4.43"E	Vegetation Cover	Vegetation Cover	Vegetation Cover	
33	21° 39' 8.66" N 87° 39' 10.17" E	Bw Tanks/Ponds	Agricultural land	Agricultural land	
34	21° 41' 10.87" N 87° 35' 20.81" E	Sattlement	Agricultural land	Agricultural land	
35	21° 42' 5.11" N 87° 41' 19.31" E	Sattlement	Vegetation Cover	Agricultural land	
36	21° 43' 4.65" N 87° 41' 13.25" E	Agricultural land	Agricultural land	Bw Tanks/Ponds	

Contd...

GT	GPS reading (Latitude & Longitude)	Ground Truth (2008) By Public Consultation	Ground Truth (2012) By Public Consultation	Ground Truth (2016) By field observation	Mismatch
37	21° 41' 15.22" N 87° 40' 5.46" E	Agricultural land	Fw Tanks/Ponds	Fw Tanks/Ponds	
38	21° 44' 11.20" N 87° 45' 11.89" E	Agricultural land	Agricultural land	Agricultural land	
39	21° 45' 40.57" N 87° 48' 19.62" E	Vegetation Cover	Vegetation Cover	Sattlement	
40	21° 45' 40.04" N 87° 50' 2.02" E	Fw Tanks/Ponds	Fw Tanks/Ponds	Bw Tanks/Ponds	
41	21° 46' 59.24" N 87° 50' 17.58" E	Bw Tanks/Ponds	Bw Tanks/Ponds	Bw Tanks/Ponds	
42	21° 48' 24.94" N 87° 52' 14.55" E	Agricultural land	Bw Tanks/Ponds	Bw Tanks/Ponds	
43	21° 50' 13.65" N 87° 51' 9.71" E	Vegetation Cover	Sattlement	Sattlement	
44	21° 51' 18.05" N 87° 51' 17.95" E	Agricultural land	Bw Tanks/Ponds	Bw Tanks/Ponds	
45	21° 50' 30.02" N 87° 49' 10.87" E	Sattlement	Sattlement	Sattlement	
46	21° 51' 51.12" N 87° 49' 6.86" E	Nayanjuli	Nayanjuli	Bw Tanks/Ponds	
47	21° 51' 28.38" N 87° 46' 32.31" E	Agricultural land	Agricultural land	Bw Tanks/Ponds	
48	21° 49' 32.16" N 87° 43' 17.51" E	Fw Tanks/Ponds	Fw Tanks/Ponds	Fw Tanks/Ponds	
49	21° 47' 59.62" N 87° 41' 57.29" E	Sattlement	Sattlement	Sattlement	
50	21° 46' 33.53" N 87° 40' 36.63" E	Vegetation Cover	Agricultural land	Agricultural land	
51	21° 44' 30.71" N 87° 39' 5.83" E	Fw Tanks/Ponds	Fw Tanks/Ponds	Fw Tanks/Ponds	
52	21° 44' 1.33" N 87° 38' 46.05" E	Nayanjuli	Nayanjuli	Nayanjuli	
53	21° 43' 15.53" N 87° 35' 55.61" E	Vegetation Cover	Sattlement	Sattlement	
54	21° 41' 59.62" N 87° 37' 47.51" E	Agricultural land	Bw Tanks/Ponds	Bw Tanks/Ponds	
55	21° 40' 40.55" N 87° 35' 53.01" E	Fw Tanks/Ponds	Fw Tanks/Ponds	Fw Tanks/Ponds	
56	21° 38' 58.95" N 87° 36' 45.58" E	Agricultural land	Agricultural land	Agricultural land	*
57	21° 40' 10.87" N 87° 34' 27.98" E	Vegetation Cover	Vegetation Cover	Vegetation Cover	
58	21° 40' 33.56" N 87° 37' 20.65" E	Nayanjuli	Nayanjuli	Nayanjuli	
59	21° 42' 4.85" N 87° 36' 42.70" E	Agricultural land	Fw Tanks/Ponds	Fw Tanks/Ponds	
60	21° 38' 52.99" N 87° 33' 37.49" E	Agricultural land	Agricultural land	Agricultural land	
61	21° 37' 13.65" N 87° 30' 45.59" E	Vegetation Cover	Vegetation Cover	Vegetation Cover	
62	21° 36' 59.91" N 87° 29' 24.86" E	Agricultural land	Agricultural land	Fw Tanks/Ponds	

APPENDIX – B

1. Details of Land use and Land cover change classes by change detection/ transition matrix

Sl no	Change class	Acronym
1	Agriculture land into Brackish water tanks/ponds	Ag_Bwtp
2	Agriculture land into Settlement	Ag_Sm
3	Agriculture land into Fresh water tanks/ponds	Ag_Fwtp
4	Vegetation cover into Brackish water tanks/ponds	Vc_ Bwtp
5	River/ stream/ canal into Brackish water tanks/ponds	W_Bwtp
6	Sandy area into Scrub land	Sa_Sl
7	Fresh water tanks/ponds into Brackish water tanks/ponds	Bwtp_ Fwtp
8	Scrub land into Brackish water tanks/ponds	Sl_ Bwtp
9	Sandy area into Brackish water tanks/ponds	Sa_ Bwtp
10	Vegetation cover into Settlement	Vc_Sm
11	Sandy area into Settlement	Sa_Sm
12	Nayanjuli into Brackish water tanks/ponds	Nj_ Bwtp
13	Vegetation cover into Fresh water tanks/ponds	Vc_ Fwtp
14	Sandy area into Fresh water tanks/ponds	Sa_ Fwtp
15	Scrub land into Fresh water tanks/ponds	Sl_ Fwtp
16	Agriculture land into Vegetation cover	Ag_Vc

2. Elements of visual image interpretation							
Class	**Tone/Colour**	**Size**	**Shape**	**Texture**	**Pattern**	**Location**	**Association**
Fresh Water Tanks/Ponds	Blue to dark blue	Small to medium	Regular to irregular	Medium to smooth	Scattered and non-contiguous	Close to settlement, agriculture land, forest and road	Settlement, agriculture land, vegetation
Brackish Water Tanks/Ponds	Light blue	Small to medium	Regular	Smooth	Cluster and contiguous	Coastal creeks, lagoons, river, stream and canal side	Creeks, Lagoon, river, stream, canal
Nayanjuli (Roadside ditches)	Greenish to dark blue	Medium narrow	Irregular	Smooth to medium	Linear	Rail ,road and embankment side	Rail, road, embankment
River/Stream/ Canal	Light blue to dark	Long narrow to wide	Regular to irregular	Smooth to medium	Contiguous, non-linear to dendritic	Natural Rivers/ streams	Vegetation along the banks and river side
Sea	Light blue	Large and extensive	Irregular, continuous	Smooth	Contiguous	End of coastal land	Coastal land
Agricultural Land	Whitish, brown and light green (subject to agriculture time)	Varying in size	Regular to irregular	Medium to smooth	Contiguous to non-contiguous	Cultivable wastelands	Amidst irrigated (canal, tanks etc.) and un-irrigated (rainfed/dry farming arable lands)
Vegetation Cover	Light green to dark green	Varying in size	Irregular, discontinuous	Smooth to medium (Depending upon vegetation density)	Contiguous to non-contiguous	Coastal plain and road, river, stream canal side	Road, river, stream, canal, coastal plain
Sandy Area	White to half white (subject to moisture content)	Medium to large	Regular to irregular	Smooth to mottled	Contiguous to linear	Sea bed	Sea, Sand dune
Scrub Land	Light green	Small to medium	Irregular, discontinuous	Coarse and mottled	Contiguous, dispersed in patches	Terrain with varying land forms	Gentle relief with moderate slope in plains and agriculture land
Settlement	Whitish to light brown	Small to medium patches	Irregular and discontinuous	Coarse and mottled	Cluster to scattered and non-contiguous	Road, rail, stream and tanks/ponds side	Road, rail, river ,canal side, surrounded by agricultural land
Transportation	Light black to dark black (Mettled road) Whitish (Unmettled)	Small in width for roads and narrow for rail	Regular with straight/ sharp and smooth curves	Smooth to fine	Linear to sinuous and contiguous	Across waterbodies agriculture lands , connecting settlements	Settlement, roads, canal, stream, river

APPENDIX - C

1. QUESTIONNAIRE FOR ECONOMIC IMPACT ASSESSMENT [FOR VILLAGE SURVEY]

1.	Particulars of the Area (village) [Name, location with GPS reading]:					
2.	Particulars of the respondent [name, age, sex, family members, educational status]:					
	Before Shrimp farm					
3.	Purpose used of land (√)	**Agriculture**	**Aquaculture**	**Forest**	**Fallow land**	**Others**

4.a	Size of land (acre)	Total area	Land honor	
			Own	Lease
b	Amount give to the honor (Rs/acre/year)			

5.a	Crop pattern (if agriculture)	**Mono/Multi crop**	**Type of the crop and yield/annum**	**Market price (Rs/-)**
b	Expense of Cultivation (Labor, fertilizer, irrigation, etc.)			
6	Total income from agriculture(Rs/-Year)			
7	Others source of income(except agriculture)		**Annual income (Rs/-)**	
	During shrimp framing			

8	Size of land (acre)	Total area(acre)	Land owner	
			Own	Lease

Set up cost

		First Time	**Present Time**
9.a	Land rent (Rs/acre/year)		
b	Digging		
c	Labour		
d	Medicine		
e	Transport		
f	Others		

Contd...

	Capital Cost				
Running cost					
Types of Cost / Time		**1st Time**	**2nd Time**	**3rd Time**	**4th Time**
10.a	Prawn				
b	Feed				
c	Labour				
d	Medicine				
e	Maintains				
f	Diesel				
g	Electric				
i	Guard				
j	Own Labour				
k	Transport				
Total cost					
11.Intent own Capital					
12.Intent loan					
a. From Bank					
b. From money lender					
c. Actual cost					
13. Additional cost					
Total cost					
14. Time period					
15.Others(Transport(T),Marketing(M),Packing(P)					
16. Production(ton/acre)					
17. Market Price(Rs/-)					
18.	Number of shrimp culture in a year (√)		One	Two	

Contd...

19.a	Other aquaculture (if one time shrimp farming in year)		
b	Expanse of culture(Rs/-)		
c	Production	Amount(Ton)	Market price(Rs/-)
20	Total profit of other aquaculture		
21	Total profit of aquaculture ,Rs/-		

For Paddy Farmer					
1.	Particulars of the Area (village) [Name, location with GPS reading]:				
2.	Particulars of the respondent [name, age, sex, family members, educational status]:				
3	Size of land (acre)	Total area	Land honor		
			Own	Lease	
b	Amount give to the honor (Rs/acre/year)				
5.a	Crop pattern (if agriculture)	Mono/Multi crop	Type of the crop and yield/annum	Production	Market price (Rs/-)
b	Expense of Cultivation (Labor, fertilizer, irrigation, etc.)				
6	Total income from agriculture(Rs/-Year)				
7	Others source of income(except agriculture)		Annual income (Rs/-)		

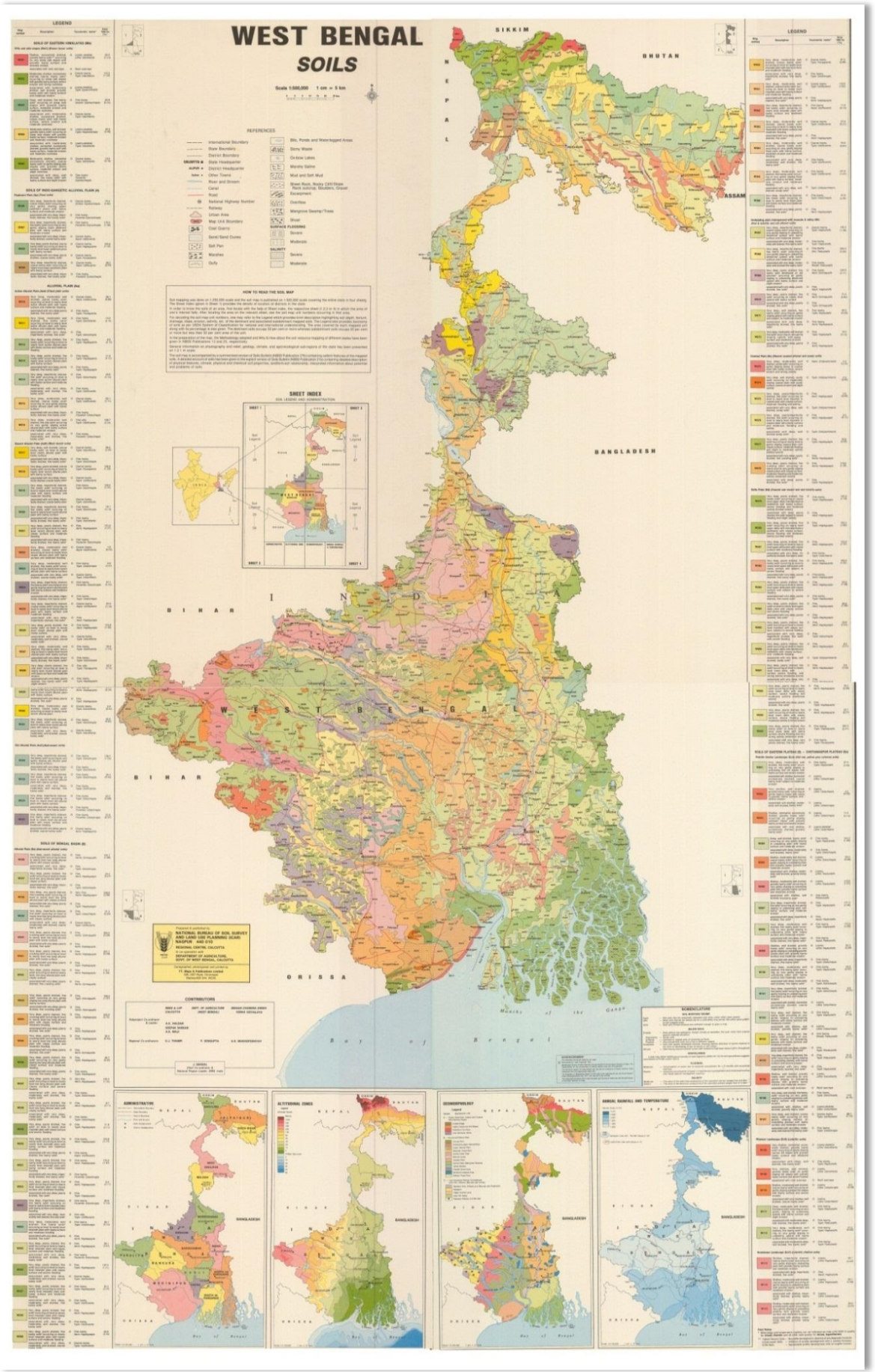
2. Questionnaire Checklist for Scoping the Prime Impact (For Village Survey)							
Particulars of Area (Village) [Name, Location with GPS reading]							
Particular of the respondent [name, age, sex, family members, educational status]							
Question on natural and cultural environmental elements:		Yes	No	Not Known	Level of significance	Magnitude of impact
a.	Employment opportunity					
b.	Valid permit					
c.	Poper water management					
d.	Generate water effluents (wastewater)					
e.	Activity air emissions					
f.	Generate solid waste					
g.	Import of living organisms, e.g. saplings, insects, animals, etc.					
	Causing environmental damage (e.g. tidal floods, land slide, embankment erosion, deforestation)					
h.	Change in household choice, shopping, recreational facilities and services					
i.	Lifestyle and Cultural changes					
j.	Crime , Money and *Muscle power*					
k.	Impact on health condition					
l.	Development community facilities and services					
Level of significance varies between 0 to 10 and magnitude of impact range from -10 to +10 and these value are entered only when the answer is 'Yes'							
Questions are prepare on following natural and cultural environmental elements: 1. Soil, 2. Land from, 3. Surface water, 4.Ground water, 5. Air quality, 6. Soil erosion, 7. Deposition/Sedimentation 8. Biological condition, 9. Life style, 10. Health and safety, 11. Employment, 12. Social value, 13. Transportation network, 14. Waste disposal, 15. Salinization of water resources, 16. salinization of surficial material							

3. Selected parts of Leopold Matrix for Environmental impact assessment of inland shrimp farming in coastal blocks of Purba Medinipur district

				Project Action															
				A. Modification of regime					B. Land transformation & constriction					D. Processing	H. Waste emplacement and treatment	J. Accident	Row Total	
				d. Alteration of ground cover				g. River control and flow modification	b. Industrial sites and building	e. Road and trails	l. Canals	r. Cut and fill		a. Farming	e. Junk disposal	b. Spill and leaks		
				1. Agriculture land to Bw tanks/ponds	2. River/stream/canal to Bw tanks/ponds	3. scrub land to Bw tanks/ponds	4. Vegetation cover to Bw tanks/ponds	1.water flow modification	1. Processing unit, Ice Factory, ware house		1. Inlet/outlet canal and drainage	1.Cut new tanks ponds	2.Fill agriculture land	1. Shrimp Farming			+	-
Natural and Human environmental elements	A. Physical & chemical characteristic	1. Earth	c. Soil	**-9×8**		**-5×6**		**-2×6**		**-2×6**				**-7×7**				**159**
			d. Landform	**-6×8**			**-3×7**	**-4×5**		**-1×4**				**-6×7**				**135**
		2.Water	a. Surface	**-4×6**	**-2×5**		**-3×5**		**-2×6**		**-4×4**			**-5×7**	**-3×6**	**-4×5**		**150**
			c. Underground	**-1×5**		**-1×2**	**-1×4**							**-1×7**		**-2×4**		**26**
		3. Atmosphere	a. Quality (gases, particules)				**-6×6**							**-4×5**				**56**
			c. Temperature				**-4×5**							**-3×7**				41
		4. Processes	a. Erosion		**-4×4**	**-1×3**	**-2×4**	**-2×8**		**-2×3**	**-2×6**	**-1×8**		**-4×4**				85
			c. Deposition		**-2×3**						**-4×5**	**-2**×5	**-3×5**	**-3×5**	**-2×5**			76

Contd..

Natural and Human environmental elements	B. Biological condition	1. Flora	a. Tree				**-5×6**							**-4×5**				50
			b. Shrub land			**-5×7**					**-3**×5			**-5**×6				80
		2. Fauna	c. Fish		**-4×3**									**+5×5**			25	12
			g. Endangered species		**-5×4**	**-4×6**												44
	C. Cultural factor	1. Land-use	e. Agriculture	**-7×8**									**-2×6**	**-6×7**		**-6×8**		180
		4. Cultural status	a. Life style											**+6×7**			42	
			b Health and safety						**-3×5**					**-3×8**				39
			c. Employment	**-4×6**	**+3×4**	**+4×5**			**+6×6**			**+6**×8		**+8×9**			188	24
			e. Social value	**-4×4**									**-1×6**	**-2×8**				38
		5. Man-made facility and activity	b. Transportation network(movement access)							**+4×6**				**+5×6**				54
			d. Waste disposal						**-2×6**					**-4×6**	**-5×5**			61
	D. Ecological relationship	Salinization of water resources		**-5×7**										**-6×7**		**-5×7**		112
		e. Salinization of surficial material		**-5×7**										**-3×6**	**-2×6**	**-4×6**		89
Column Total			+		12	20			36	24		48		155				
			_	315	64	94	134	48	39	20	63	18	33	421	65	135		



Soil map of West Bengal (Scale 1:500,000)