



Water quality analysis

Table I Descriptive statistics for the water quality parameters of the Kolong River

Parameters	PRM		MON		POM	
	Avr(Stn.dev)	Range	Avr(stn.dev)	Range	Avr(stn.dev)	Range
Temp (°C)	23.7(±0.34)	23.2-24	27(±0.49)	26.5-28	24.5(±0.46)	22.8-25.8
pH	7.11(±0.521)	6.1-7.59	6.65(±0.059)	6.59-6.75	6.57(±0.34)	6.23-7.12
EC (µS/cm)	0.17(±0.122)	0.06-0.207	2.02(±2.08)	1.02-6.69	0.14(±0.05)	0.09-0.19
TSS (mg/l)	81.14(±13.74)	65-105	144.05(±27.4)	97.88-178.21	65.68(±16.04)	48-95
TDS (mg/l)	313.55(±44.97)	250-370	257.69(±32.9)	210.75-300	153.3(±18.66)	122-175
Turbidity (NTU)	20 (±21.9)	8-59.2	61.86 (±26.58)	20.04-99.2	38.46 (±28.64)	12-94
TA(mg/l)	210.71 (±70.5)	150-300	231.43 (±96.5)	100-360	153.57 (±46.6)	100-225
K ⁺ (mg/l)	5.55 (±3.02)	3.09-10.12	0.66 (±0.44)	0-1.41	2.02 (±1.6)	0-5.22
Na ⁺ (mg/l)	9.25(±2.02)	6.3-12.09	10.43(±2.17)	8.5-14.4	7.82(±0.39)	7.5-8.21
TH(mg/l)	90.86 (±41.03)	52-164	139.43 (±70.82)	88-288	183.42 (±87.62)	72-296
Ca ⁺ (mg/l)	16.26 (±7.26)	9.6-28.86	23.36 (±5.77)	16.03-33.67	35.05 (±20.2)	9.75-62.46
Ma ⁺ (mg/l)	12.26 (±5.98)	4.87-22.43	19.93 (±17.7)	1.93-53.66	15.92 (±8.8)	9.6-35.27
DO (mg/l)	8.93 (±2.48)	6.08-12.83	2.66 (±1.12)	0.8-4.05	6.23 (±4.62)	0-13.78
BOD ₅ (mg/l)	13.02(±0.54)	12.49-13.88	20.42(±3.58)	17.5-26.8	16.9(±2.3)	13.79-19.7
Free CO ₂ (mg/l)	31.43 (±15.5)	22-29.7	37.4 (±34.5)	8.8-105.6	23.8 (±10.11)	17.6-44
Cl ⁻ (mg/l)	69.4 (±16.15)	45.44	55.58 (±8.65)	45.44-71	25.56 (±5.2)	19.88-34.08
Fl ⁻ (mg/l)	0.63(±0.39)	0.214-1.18	0.42(±0.365)	0.1-0.9	0.51(±0.38)	0.18-1
SO ₂ ⁻⁴ (mg/l)	12.6(±5.4)	6.6-21.6	14.6(±4.1)	11-21.9	13.27(±4.35)	11.6-20.74
Fe (mg/l)	0.61(±0.25)	0.37-0.84	0.15(±0.1)	0.05-0.33	0.5(±0.22)	0.1-0.8
Total coliform (colonies/100ml)	13 (±3.87)	7-19	16.7 (±4.68)	9-22	13.57 (±4.3)	6-17
Fecal coliform (colonies/100ml)	2(±1.3)	1-4	3.3 (±2.4)	1-7	2 (±2.5)	0-6

Table II Calculation of WQI at site S_{w1}

Parameter	PRM			MON			POM		
	V _n	Q _n	Q _n W _n	V _n	Q _n	Q _n W _n	V _n	Q _n	Q _n W _n
pH	6.5	-33.33	-6.13	6.64	-24	-4.416	6.23	-51.33	-11.04
EC	1690	563.33	3.43	411	137	0.83	199	66.33	0.404
TDS	250	50	0.1565	230.45	46.09	0.144	122	24.4	0.089
TSS	65	13	0.041	122.5	24.5	0.0767	60	12	0.044
TH	164	54.66	0.28	92	30.66	0.159	140	46.66	0.28
Chloride	76.86	30.74	0.19	53.96	21.58	0.135	34.08	13.632	0.1
DO	0	152.08	47.6	2.43	126.77	39.679	3.4	116.66	42.7
BOD	13.3	266	83.258	17.8	356	130.3	15.01	300.2	109.87
Sulphate	9.915	6.6	0.068	12.03	8.02	0.0834	11.6	7.73	0.1
TA	275	229.16	2.98	220	183.33	2.383	100	83.33	1.27
	$\Sigma W_n Q_n = 131.87$ WQI=131.74			$\Sigma W_n Q_n = 169.37$ WQI = 169.2			$\Sigma W_n Q_n = 143.82$ WQI = 143.67		

Table III Calculation of WQI at site S_{w2}

Parameter	PRM			MON			POM		
	V _n	Q _n	Q _n W _n	V _n	Q _n	Q _n W _n	V _n	Q _n	Q _n W _n
pH	6.31	-46	-9.89	6.6	-26.66	-5.732	6.26	-49.33	-10.605
EC	1017	339	2.07	169.9	56.63	0.345	130	43.33	0.264
TDS	269	53.8	0.197	250.66	50.132	0.1834	150	30	0.1098
TSS	88	17.6	0.064	160.73	32.146	0.118	78	15.6	0.057
TH	52	17.33	0.1057	100	0.333	0.002	228	0.76	0.0046
Chloride	59.64	23.856	0.1746	53.96	0.2158	0.0016	19.88	7.952	0.0582
DO	5.16	98.3	35.98	3.24	118.33	43.31	6.1	88.54	32.405
BOD	8.4	168	61.488	12.58	251.6	92.08	9.8	196	71.736
Sulphate	12.84	8.56	0.1044	15.1	10.066	0.123	13	8.66	0.1056
TA	275	229.16	3.49	360	300	4.575	100	83.33	1.27
	$\Sigma W_n Q_n = 93.78$; WQI=93.7			$\Sigma W_n Q_n = 135.01$ WQI = 134.87			$\Sigma W_n Q_n = 95.4$ WQI=95.3		

Table IV Calculation of WQI at site S_{w3}

Parameter	PRM			MON			POM		
	V _n	Q _n	Q _n W _n	V _n	Q _n	Q _n W _n	V _n	Q _n	Q _n W _n
pH	7.25	16.66	3.58	6.75	-16.66	-3.58	6.52	-32	-6.88
EC	1048	349.33	2.13	207	69	0.42	109.3	36.43	0.22
TDS	345	69	0.25	257.97	51.594	0.188	150	30	0.1098
TSS	72	14.4	0.0527	165	33	0.12	56	11.2	0.0409
TH	68	22.66	0.138	129	40	0.244	76	25.33	0.1545
Chloride	62.48	24.992	0.1829	62.48	24.99	0.1829	19.88	7.952	0.0582
DO	11.35	33.85	12.389	3.24	118.33	43.308	8.11	67.6	24.74
BOD	6.31	126.2	46.19	9.1	182	66.612	4.3	86	31.476
Sulphate	6.587	4.39	0.0535	9.82	6.546	0.0798	7.07	4.71	0.0574
TA	175	145.83	2.22	260	216.66	3.3	175	145.83	2.22
	$\Sigma W_n Q_n = 67.2$ WQI=67.13			$\Sigma W_n Q_n = 110.87$ WQI = 110.76			$\Sigma W_n Q_n = 52.2$ WQI=52.15		

Table V Calculation of WQI at site S_{w4}

Parameter	PRM			MON			POM		
	V _n	Q _n	Q _n W _n	V _n	Q _n	Q _n W _n	V _n	Q _n	Q _n W _n
pH	7.47	31.33	6.736	6.6	-26.66	-5.732	6.32	-45.33	-9.746
EC	1885	628.33	3.83	191	63.66	0.4	159	53	0.32
TDS	370	74	0.27	300	60	0.22	166	33.22	0.1216
TSS	80	16	0.058	143.87	28.77	0.1053	66.78	13.356	0.0488
TH	128	42.66	0.26	288	96	0.5856	296	98.66	0.602
Chloride	94.56	37.824	0.277	53.96	21.584	0.158	28.4	11.36	0.083
DO	10.54	42.29	15.48	0.81	143.64	52.57	6.08	88.75	32.48
BOD	12.9	258	94.43	13.88	277.6	101.6	9.7	194	71.004
Sulphate	6.64	4.42	0.054	11	7.33	0.0894	10.31	6.87	0.0838
TA	300	250	3.81	340	283.33	4.32	255	187.5	2.86
	ΣW _n Q _n =125.2 WQI=125.07			ΣW _n Q _n =154.32 WQI=154.16			ΣW _n Q _n =97.86 WQI=97.76		

Table VI Calculation of WQI at site S_{w5}

Parameter	PRM			MON			POM		
	V _n	Q _n	Q _n W _n	V _n	Q _n	Q _n W _n	V _n	Q _n	Q _n W _n
pH	7.59	39.33	8.45	6.66	-22.66	-4.89	6.9	-6.66	-1.43
EC	1062	354	2.16	84.6	28.2	0.17	97	32.33	0.2
TDS	350	70	0.256	210.75	42.15	0.154	170	34	0.124
TSS	105	21	0.077	178.21	35.64	0.13	95	19	0.069
TH	88	29.33	0.18	168	56	0.34	240	80	0.488
Chloride	68.16	27.26	0.199	45.44	18.176	0.133	25.26	10.104	0.0739
DO	11.6	31.25	11.437	3.7	113.54	41.55	9.12	57.08	20.89
BOD	4.2	84	30.74	7.5	150	54.9	6.3	126	46.116
Sulphate	15.47	10.31	0.1257	16.4	10.93	0.133	14.4	9.6	0.117
TA	150	125	1.9	200	1.66	0.025	175	148.83	2.73
	ΣW _n Q _n =55.52 WQI=55.46			ΣW _n Q _n =92.64 WQI=92.55			ΣW _n Q _n =69.4 WQI=69.33		

Table VII Calculation of WQI at site S_{w6}

Parameter	PRM			MON			POM		
	V _n	Q _n	Q _n W _n	V _n	Q _n	Q _n W _n	V _n	Q _n	Q _n W _n
pH	7.21	14	3.01	6.59	-27.33	-5.876	7.12	8	1.72
EC	1161	387	2.36	69	23	0.14	212.2	70.73	0.43
TDS	290	58	0.212	255	51	0.1866	175	35	0.128
TSS	70	14	0.0512	97.88	19.576	0.0716	48	9.6	0.035
TH	80	26.66	0.1626	120	40	0.244	232	77.33	0.472
Chloride	45.44	18.176	0.133	48.28	19.312	0.141	22.72	9.088	0.0665
DO	13.778	8.56	3.133	4.054	109.85	40.205	12.83	18.437	6.75
BOD	5.34	106.8	44.65	7.06	141.2	51.68	5.1	102	37.33
Sulphate	15.184	10.123	0.1235	21.9	14.6	0.178	15.8	10.53	0.128
TA	125	104.16	1.588	100	83.33	1.271	175	145.83	2.22
	ΣW _n Q _n =55.42 WQI=55.36			ΣW _n Q _n =88.24 WQI=88.15			ΣW _n Q _n =49.3 WQI=49.25		

Table VIII Calculation of WQI at site S_{w7}

Parameter	PRM			MON			POM		
	<i>V_n</i>	<i>Q_n</i>	<i>Q_nW_n</i>	<i>V_n</i>	<i>Q_n</i>	<i>Q_nW_n</i>	<i>V_n</i>	<i>Q_n</i>	<i>Q_nW_n</i>
pH	7.44	29.33	6.306	6.7	-20	-4.3	6.63	24.66	-5.3
EC	1253	417.66	2.55	60	20	0.122	90	30	0.183
TDS	320.88	64.176	0.235	299	59.8	0.2188	140	28	0.102
TSS	88	17.6	0.064	140.18	28.036	0.1026	56	11.2	0.041
TH	56	18.66	0.1138	88	29.33	0.1789	72	24	0.146
Chloride	76.68	30.67	0.224	71	28.4	0.208	28.4	11.36	0.083
DO	12.16	25.42	9.3	3.24	118.33	43.31	9.12	57.08	20.89
BOD	6.9	138	50.51	9	180	65.88	5.5	110	40.26
Sulphate	21.637	14.42	0.176	21.9	14.6	0.178	20.74	13.83	0.168
TA	175	145.83	2.224	140	116.66	1.779	100	83.3	1.27
	$\Sigma W_n Q_n = 71.7$ WQI=71.63			$\Sigma W_n Q_n = 107.7$ WQI = 107.59			$\Sigma W_n Q_n = 57.84$ WQI=57.78		

B

Hydrological data

Table I Flow regime of Kolong River at Missamukh (1984-2000)

Year	Maximum Q in cumec	Minimum Q in cumec
1984	13.52	0.43
1985	22.64	0.5
1986	56.2	0.8
1987	29.6	0.7
1988	43.9	1.42
1989	46.45	0.54
1990	27.86	0.84
1991	27.7	0.6
1992	36.21	0.25
1993	12.65	0.67
1994	4.96	1.02
1995	19.1	0.95
1996	11.57	0.83
1997	23.41	1.26
1998	12.4	0.67
1999	5.667	1.02
2000	7.63	0.99
Average	23.616	0.79

Table II Flow regime of Kolong River at Missamukh (2011-2016)

Year	Maximum Q in cumec	Minimum Q in cumec
2011	3.5469	1.1816
2012	3.764	1.0659
2013	13.91	1.053
2014	10.557	1.606
2015	8.468	1.0398
2016	12.3	1.176
Average	8.76	1.187

Table III Flow regime of Kolong River at Nagaon (1983-1996)

Year	Maximum Q in cumec	Minimum Q in cumec
1983	84.25	5.61
1984	57.36	6.73
1985	59.21	8.53
1986	100.23	6.84
1987	50.1	6.12
1988	42.42	6.23
1989	90.77	8.92
1990	46.7	12.76
1991	97.26	12.307
1992	48.64	12.37
1993	61.96	11.85
1994	41.28	10.95
1995	58.15	9.69
1996	45.05	8.67
Average	63.1	9.11

Table IV Flow regime of Kolong River at Nagaon (2011-2016)

Year	Maximum Q in cumec	Minimum Q in cumec
2011	20.67	0.23
2012	15.53	0.153
2013	85.086	0.462
2014	50.38	1.219
2015	33.4	2.434
2016	47.44	1.84
Average	42.084	1.056

Table V Water level (WL) of Kolong River at Nagaon (1983-1996)

Year	Maximum WL in m	Minimum WL in m
1983	59.16	56.17
1984	58.93	56.01
1985	59.34	56.37
1986	60.1	55.15
1987	57.3	54.99
1988	60.1	55.96
1989	59.23	55.45
1990	57.91	56.42
1991	59.02	56.43
1992	58.68	56.16
1993	59.23	56.13
1994	58.5	56
1995	58.8	56.45
1996	58.7	55.95
Average	58.93	55.97

Table VI Water level (WL) of Kolong River at Nagaon (2011-2016)

Year	Maximum WL in m	Minimum WL in m
2011	59	54.6
2012	58.39	53.97
2013	59.96	53.61
2014	58.96	54.15
2015	57.71	54.2
2016	58.43	53.65
Average	58.74	54.03

Table VII Flow regime of Kolong River at Jagibhakatgaon (1977-1988)

Year	Maximum Q in cumec	Minimum Q in cumec
1977	740.94	39.4
1978	797.49	44.91
1979	1157.14	27.73
1980	1093.31	47.9
1981	1077.01	60.166
1982	1606.61	32.25
1983	1589.06	47.78
1984	1434.97	57
1985	1240.99	51.27
1986	2535.36	32.6
1987	1270.59	53.485
1988	2418.2	26.693
Average	1413.47	43.43

Table VIII Flow regime of Kolong River at Jagibhakatgaon (2011-2016)

Year	Maximum Q in cumec	Minimum Q in cumec
2011	588.74	31.46
2012	703.5	15.93
2013	708.95	22.5
2014	486.58	50.99
2015	670.97	19.93
2016	580.44	42.07
Average	623.2	30.48

Table IX Flow regime of Kolong River at Kajalimukh (1986-1995)

Year	Maximum Q in cumec	Minimum Q in cumec
1986	2560	120.9
1987	1850	95.67
1988	1784	111.7
1989	1009	172.33
1990	1239	90.1
1991	2472.9	81.68
1992	1804.8	104.06
1993	1703.9	148.35
1994	2890.78	132.96
1995	1673.217	105.44
Average	1898.76	116.32

Table X Flow regime of Kolong River at Kajalimukh (2011-2016)

Year	Maximum Q in cumec	Minimum Q in cumec
2011	658.9	67.8
2012	752.64	36.23
2013	927.7	95.67
2014	722.77	78.9
2015	745.87	58.7
2016	621.2	55.79
Average	738.18	65.515

Table XI Maximum and minimum Water Level (m) of Brahmaputra River (1979 to 201)

Year	Maximum water level (m)	Year	Maximum water level (m)	Year	Maximum water level (m)
1979	68.248	1994	67.02	2009	67.72
1980	68.863	1995	68.37	2010	67.97
1981	68.193	1996	68.18	2011	67.47
1982	68.622	1997	68.41	2012	67.93
1983	68.193	1998	68.22	2013	67.7
1984	68.328	1999	68.02	2014	66.8
1985	68.248	2000	68.22	2015	67.66
1986	68.888	2001	67.65	2016	68.2
1987	68.388	2002	68.74		
1988	67.678	2003	68.54		
1989	67.97	2004	68.91		
1990	67.85	2005	68.01		
1991	68.97	2006	67.15		
1992	68.07	2007	68.46		
1993	68.42	2008	67.68		



Runoff estimation

Table I Weighted CN estimation for Kolong basin

LU/LC class	HSG	Area (A_i) (in Km^2)	CN (CN_i)	$A_i CN_i$
Agricultural land	A	706.706	76	53709.656
	B	357.559	86	30750.074
	C	7.28	90	655.2
	D	377.846	93	35139.678
Built-up area	A	964.8	77	74289.6
	B	385.88	85	32799.8
	C	3.36	90	302.4
	D	484.804	92	44601.968
Forest cover	A	87.47	26	2274.22
	B	15.978	40	639.12
	C	28.608	58	1659.264
	D	1182.31	61	72120.91
Shrubland	A	148.168	33	4889.544
	B	72.096	47	3388.512
	C	0.75	64	54.782
	D	126.819	67	8496.873
Wetland	A	130.68	98	12806.64
	B	37.71	98	3695.58
	C	0.559	98	48
	D	85.127	98	8342.446
Open Space	A	4.08	71	289.68
	B	0.597	80	47.76
	C	-	-	-
	D	9.564	88	841.632
		A=5218.75		$\Sigma A_i C_i = 391843.339$
		$CN_w = 75.08$		

Table II Weighted CN estimation for Missa basin

LU/LC class	HSG	Area (A_i) (in Km^2)	CN (CN_i)	$A_i C N_i$
Agricultural land	A	20.8	76	1580.8
	B	-	86	-
	C	-	90	-
	D	17.94	93	1688.42
Built-up area	A	11.37	77	875.49
	B	-	85	-
	C	-	90	-
	D	13.6	92	1251.2
Forest cover	A	11.74	26	305.24
	B	-	40	-
	C	-	58	-
	D	22.34	61	1362.74
Shrubland	A	0.45	33	14.85
	B	-	47	-
	C	-	64	-
	D	1.5	67	100.5
Wetland	A	2.8	98	274.4
	B	-	98	-
	C	-	98	-
	D	0.05	98	4.9
Open Space	A	5.27	71	374.17
	B	-	80	-
	C	-	-	-
	D	1.01	88	88.88
		A=108.87		$\Sigma A_i C_i = 7921.59$
$CN_w = 72.76$				

Table III Weighted CN estimation for Diyu basin

LU/LC class	HSG	Area (A_i) (in Km^2)	CN (CN_i)	$A_i CN_i$
Agricultural land	A	3.12	76	237.12
	B	-	-	-
	C	-	-	-
	D	25.2	93	2343.6
Built-up area	A	6.6	77	508.2
	B	0.74	85	62.9
	C	-	-	-
	D	50.04	92	4603.68
Forest cover	A	-	-	-
	B	-	-	-
	C	-	-	-
	D	149.55	61	9122.55
Shrubland	A	0.036	33	1.188
	B	-	-	-
	C	-	-	-
	D	7.125	67	477.375
Wetland	A	0.31	98	30.38
	B	-	-	-
	C	-	-	-
	D	-	-	-
Open Space	A	-	-	-
	B	-	-	-
	C	-	-	-
	D	-	-	-
		A=242.72		$\Sigma A_i C_i = 17386.99$
		$CN_w = 71.63$		

Table IV Weighted CN estimation for Haria basin

LU/LC class	HSG	Area (A_i) (in Km^2)	CN (CN_i)	$A_i CN_i$
Agricultural land	A	69.3	76	5266.8
	B	69.2	86	5951.2
	C	2.4	90	216
	D	28.2	93	2622.6
Built-up area	A	109	77	8393
	B	65.9	85	5601.5
	C	2	90	180
	D	47.55	92	4374.6
Forest cover	A	12.7	26	330.2
	B	11.4	40	456
	C	22.9	58	1328.2
	D	287.53	61	17539.33
Shrubland	A	14.66	33	483.78
	B	22.22	47	1044.34
	C	-	-	-
	D	8.07	67	540.69
Wetland	A	8.1	98	793.8
	B	3.24	98	317.52
	C	-	-	-
	D	-	-	-
Open Space	A	1.95	71	138.45
	B	0.15	80	12
	C	-	-	-
	D	3.04	88	267.52
		A=789.51		$\Sigma A_i C_i = 55857.53$
$CN_w = 70.75$				

D

List of Wetlands

Table I List of Wetlands within 5 km buffer of Kolong River

Sl. No	Name	Water area (sq km)	Sl. No	Name	Water area (sq km)
1	Barua Pukhuri	0.008	26	Siyalkhaiti Bil	0.1
2	Silabandha Bil	0.016	27	Gunnamara Bil	0.101
3	Gatanga Bil	0.019	28	Bokama Bil	0.101
4	Khhahania Bil	0.029	29	Dighali Bil	0.102
5	Barbherali Bil	0.031	30	Puthimati	0.1024
6	Kanuwamari Bil	0.037	31	Bhagamur Bil	0.103
7	Gatanga Bil	0.042	32	Mahlor Bil	0.1035
8	Naltali	0.045	33	Haduk Bil	0.104
9	Bherbheri Bil	0.048	34	Baral Bil	0.11
10	Dimau Bil	0.050	35	Dekhal Bil	0.113
11	moamari Bil	0.05	36	habari Bil	0.114
12	Mara Kalang Bil	0.05	37	Penai Bil	0.116
13	Maudubi Bil	0.053	38	Chatian Bil	0.120
14	Nakara Bil	0.053	39	Puthimari Bil	0.127
15	Barbilla Bil	0.054	40	Kanuwamari Bil	0.137
16	Bahadol Bil	0.055	41	Doibura Bil	0.141
17	Dipuji Jan	0.058	42	Damal Bil	0.157
18	Raumari Bil	0.065	43	Silabandha Bil	0.164
19	Bagabari Jan	0.0657	44	Bar Manaha Bil	0.165
20	Dalani Bil	0.068	45	Saru Chala Bil	0.1654
21	Rupahi Bil	0.081	46	Bhikni Doba	0.175
22	Gurguria Bil	0.082	47	Mara Kalang Bil	0.178
23	Thakurduva Bil	0.089	48	Putal Kalang	0.183
24	Kanjoli Doloni	0.092	49	Mar Bil	0.188
25	Kotani Bil	0.098	50	Gorkhu Bil	0.211

Table I continued.....

SI No	Name	Water area (sq km)	SI No	Name	Water area (sq km)
51	Saru Manaha Bil	0.212	73	Patari Bil	0.607
52	Bara Brahma Bil	0.214	74	Sathaparia Bil	0.61
53	Bar Thal	0.216	75	Bar Thal	0.623
54	Jaljari Dalani	0.217	76	Mara Kalang R	0.624
55	Erakalang Bil	0.22	77	Sapkati Bil	0.67
56	Digholi Bil	0.235	78	Gulmari Bil	0.706
57	Barpeta Bil	0.24	79	Saran Bil	0.71
58	Barbherali Bil	0.27	80	Moamari Bil	0.82
59	Thekera Bil	0.27	81	Bihar Biholi	0.823
60	Dandua Bil	0.308	82	parkhali Bil	0.878
61	Jararuwa Bil	0.317	83	Dholipit Bil	0.89
62	Samaguri Bil	0.4	84	Kachhdhara Bil	0.97
63	Khamkowa Bil	0.43	85	Raumari Bil	1.11
64	Jan Bil	0.43	86	Singimari Bil	1.19
65	Nakhanda Bil	0.435	87	Puta Kalang Bil	1.33
66	Goranga Bil	0.454	88	Punhati Doba	1.34
67	Slpiri Bil	0.464	89	Saru Manaha Bil	1.48
68	Marakalang Bil	0.488	90	Patoli Bil	1.83
69	Mukhaitapith	0.52	91	Jalikhora Bil	2.02
70	Taranga Bil	0.53	92	Jayasagar Bil	2.66
71	Mari Kalang	0.56	93	Kharputia Bil	2.78
72	Sholmari Bil	0.58	94	Chang Bil	6.97

4. Occupation:

- Mainly farming
- Mainly dairy farming
- Agricultural labour/landless labour
- Artisans/skilled technicians
- Owner of flour mill, rice mill, or any other
- Cottage industry
- Business, Shopkeepers
- Government Service

5. Dependence on Kolong River:

- Fishing
- Irrigation
- Drinking
- Communication
- Waste disposal
- Recreation
- Others

6. Is there any difference in the pattern of their livelihood prior to and after blocking the river?

Yes No

If yes, how?

7. Type of houses

- RCC
- Assam-type
- Mud
- Others

8. Source of energy:

- | | |
|--------------|--------------------------|
| LPG | <input type="checkbox"/> |
| Fuel wood | <input type="checkbox"/> |
| Kerosene | <input type="checkbox"/> |
| Bio-gas | <input type="checkbox"/> |
| Electricity | <input type="checkbox"/> |
| Solar energy | <input type="checkbox"/> |
| Others | <input type="checkbox"/> |

9. Type of Chulla:

- | | |
|-----------------|--------------------------|
| Metal | <input type="checkbox"/> |
| Mud | <input type="checkbox"/> |
| Improved chulla | <input type="checkbox"/> |
| Others | <input type="checkbox"/> |

10. Fuel-wood: Collected Bought

a). If collected, from where?:

b). If bought, from where?:

11. Land holding pattern and landuse of the study area:

a). Size of cropland owned:

b). Size of household land and homestead:

c). Type of land:

- | | |
|-------------------|--------------------------|
| Agricultural land | <input type="checkbox"/> |
| Plantation area | <input type="checkbox"/> |
| Fallow land | <input type="checkbox"/> |
| Fisheries | <input type="checkbox"/> |
| Wasteland | <input type="checkbox"/> |
| Wetland | <input type="checkbox"/> |
| Others | <input type="checkbox"/> |

d). Common crops grown*Sali**Baw*

Others (Vegetables, mustard, fruits, jute etc)

e). Distance of cropland from the river:**f). Distance of household/ homestead from the river:****g). Livestock and poultry owned:**

Yes

No

h). Number of livestock /poultry

/

i). Chemical fertilizers or pesticides used:

Yes

No

j). Name and quantity of fertilizer used:**k). Source of irrigation:****Kolong River****Ground water****Others****l). Agricultural productivity****Good****Average****Bad**

12. Ecology along river bank:

a. Existing flora/fauna:

b. Historic flora/fauna:

c. Medicinal plants:

d. Commercial plants:

13. Health issues:**Is there any water borne disease in the area?**

Yes

No

If yes, what are they?**14. Health care facilities:**

Dispensary

Hospital

108/408 facilities

Others

15. Drinking water sources:

Kolong River

*Katcha Kua**Pucca Kua*

Tube-well

Piped water (private)

Piped water (public)

Others

16. Drinking Water filtration techniques

- Sand filtration
- Candlestick filtration
- Aqua guard
- Boiling
- Direct drinking
- Others

17. Is there any wastewater treatment facilities:

Yes No

If yes, what are they?

18. Waste water disposal:

- Soak-pit
- To Kolong River via artificial drainage
- Directly to Kolong river
- Others

19. Solid waste collection and disposal facilities :

- Composting
- Door to door collection
- Direct disposal to Kolong River
- Others

20. Sanitary system:*Katcha latrine**Pucca latrine*

None of the above

21. Discharge of human or animal waste to river Kolong:

Yes

No

22. Distance to the nearest pitched road:**23. Condition of the connecting road:**

Good

Bad

24. Tourism and recreational opportunities in the study area

Yes

No

If yes, what are they?

25. Inundation by the river

Annually

Occasionally

If occasionally, what is the time interval between two successive inundations?

26. Any use of river bed:

27. Need of restoration:

Yes

No

28. What are your views regarding restoration of Kolong river?

Signature of the Responder

Date

Phone No:

Table I Education facilities

Sl. No	Sample Villages	Primary School	Middle School	Secondary School	Senior Secondary Schools	Colleges
1	Jakhalabandha	Y	Y	Y	Y	Y
2	Dhekiyal gaon	Y	N	N	N	N
3	Langichuk	Y	N	N	N	N
4	Ouguri	Y	N	N	N	N
5	Tekelipota	Y	N	N	N	N
6	Mikirhat	Y	Y	N	N	N
7	Uriagaon	Y	Y	Y	Y	N
8	Khuti Katia	Y	Y	Y	Y	Y
9	Ghahigaon	Y	Y	Y	N	N
10	Phulaguri	Y	Y	Y	N	N
11	Kajalajan	Y	Y	N	N	N
12	Tupakuchi	Y	N	N	N	N
13	Manipurtop	Y	N	N	N	N
14	Damal	Y	N	N	N	N
15	Barpak Chapari	Y	N	N	N	N
16	Jerenga Bari	Y	Y	N	N	N
17	Jagi	Y	Y	Y	Y	N
18	Gun Pathar	Y	N	N	N	N
19	Moloibari Jungle	Y	N	N	N	N
20	Barpak Jungle	Y	N	N	N	N
21	Theng Bhanga	Y	N	N	N	N

(Source: Field survey by the author)

Table II Connectivity of the sample villages

Sl. No	Sample Villages	Paved Road	Mud Road	Footpath	Navigable River
1	Jakhalabandha	Y	N	Y	N
2	Dhekiyal gaon	N	Y	N	N
3	Langichuk	Y	Y	N	N
4	Ouguri	N	Y	N	N
5	Tekelipota	Y	Y	N	N
6	Mikirhat	Y	Y	N	N
7	Uriagaon	Y	Y	N	N
8	Khuti Katia	Y	Y	Y	N
9	Ghahigaon	Y	Y	N	N
10	Phulaguri	Y	Y	N	N
11	Kajalajan	Y	Y	N	N
12	Tupakuchi	Y	Y	N	N
13	Manipurtop	Y	Y	N	N
14	Damal	Y	Y	N	N
15	Barpak Chapari	N	Y	N	N
16	Jerenga Bari	N	Y	N	N
17	Jagi	Y	Y	N	Y
18	Gun Pathar	Y	Y	N	Y
19	Moloibari Jungle	N	Y	N	Y
20	Barpak Jungle	Y	Y	N	Y
21	Theng Bhanga	Y	Y	N	Y

(Source: Field survey by the author)

Table III Drinking water facilities

Sl. No	Sample Villages	Tube Well	Well	Piped Water(Public)	Piped Water(Private)	Kolong River
1	Jakhalabandha	Y	N	Y	Y	N
2	Dhekiyal gaon	Y	N	N	N	N
3	Langichuk	Y	N	N	N	N
4	Ouguri	Y	Y	N	N	Y
5	Tekelipota	Y	Y	Y	Y	N
6	Mikirhat	Y	Y	Y	Y	N
7	Uriagaon	Y	Y	Y	Y	N
8	Khuti Katia	Y	Y	Y	Y	N
9	Ghahigaon	Y	Y	Y	Y	N
10	Phulaguri	Y	Y	Y	Y	N
11	Kajalajan	Y	Y	N	Y	N
12	Tupakuchi	Y	Y	N	Y	N
13	Manipurtop	Y	Y	N	N	N
14	Damal	Y	Y	Y	N	N
15	Barpak Chapari	Y	Y	Y	N	Y
16	Jerenga Bari	Y	Y	Y	N	N
17	Jagi	Y	Y	Y	Y	Y
18	Gun Pathar	Y	Y	Y	Y	N
19	Moloibari Jungle	Y	Y	N	N	N
20	Barpak Jungle	Y	Y	N	N	Y
21	Theng Bhanga	Y	Y	Y	N	N

(Source: Field survey by the author)

Table IV Medical facilities

Sl. No	Sample Villages	Public Health Center	Private Hospitals	Dispensary	108/104 Facilities
1	Jakhalabandha	Y	Y	Y	Y
2	Dhekiyal gaon	N	N	N	Y
3	Langichuk	N	N	Y	Y
4	Ouguri	N	N	Y	Y
5	Tekelipota	N	N	Y	Y
6	Mikirhat	Y	N	Y	Y
7	Uriagaon	Y	Y	Y	Y
8	Khuti Katia	Y	Y	Y	Y
9	Ghahigaon	N	N	Y	Y
10	Phulaguri	Y	N	Y	Y
11	Kajalajan	N	N	Y	Y
12	Tupakuchi	Y	N	Y	Y
13	Manipurtop	N	N	Y	Y
14	Damal	N	N	Y	Y
15	Barpak Chapari	Y	N	Y	Y
16	Jerenga Bari	Y	N	Y	Y
17	Jagi	Y	Y	Y	Y
18	Gun Pathar	N	N	Y	Y
19	Moloibari Jungle	N	N	Y	Y
20	Barpak Jungle	Y	N	Y	Y
21	Theng Bhanga	Y	N	Y	Y

(Source: Field survey by the author)

Table V Source of irrigation

Sl. No	Sample Villages	Groundwater (Private)	Kolong River	Govt. Irrigation System
1	Jakhalabandha	Y	N	N
2	Dhekiyal gaon	Y	N	N
3	Langichuk	Y	N	Y
4	Ouguri	Y	N	N
5	Tekelipota	Y	Y	N
6	Mikirhat	Y	Y	N
7	Uriagaon	Y	Y	Y
8	Khuti Katia	Y	N	Y
9	Ghahigaon	Y	Y	N
10	Phulaguri	Y	Y	N
11	Kajalajan	Y	Y	N
12	Tupakuchi	Y	Y	N
13	Manipurtop	Y	Y	N
14	Damal	Y	N	N
15	Barpak Chapari	Y	Y	Y
16	Jerenga Bari	Y	N	N
17	Jagi	Y	Y	Y
18	Gun Pathar	Y	N	N
19	Moloibari Jungle	Y	N	N
20	Barpak Jungle	Y	N	Y
21	Theng Bhanga	Y	Y	N

(Source: Field survey by the author)

Table VI Occupational pattern

Sl. No	Sample Villages	Agriculture	Dairy farming	Labour	Fishing	Govt. Service	Business
1	Jakhalabandha	Y	Y	Y	N	Y	Y
2	Dhekiyal gaon	Y	N	Y	Y	N	N
3	Langichuk	Y	Y	N	Y	Y	N
4	Ouguri	Y	Y	Y	Y	N	N
5	Tekelipota	Y	Y	N	Y	Y	N
6	Mikirhat	Y	Y	Y	N	Y	N
7	Uriagaon	Y	Y	Y	Y	Y	Y
8	Khuti Katia	Y	Y	Y	N	Y	Y
9	Ghahigaon	Y	Y	N	Y	Y	Y
10	Phulaguri	Y	Y	Y	Y	Y	Y
11	Kajalajan	Y	Y	Y	N	Y	N
12	Tupakuchi	Y	Y	Y	Y	N	N
13	Manipurtop	Y	Y	Y	Y	Y	N
14	Damal	Y	Y	Y	Y	N	N
15	Barpak Chapari	Y	Y	N	N	Y	N
16	Jerenga Bari	Y	Y	N	Y	N	N
17	Jagi	Y	Y	Y	Y	Y	Y
18	Gun Pathar	Y	Y	Y	Y	Y	N
19	Moloibari Jungle	Y	Y	Y	Y	Y	N
20	Barpak Jungle	Y	Y	Y	Y	Y	N
21	Theng Bhanga	Y	Y	Y	Y	N	N

(Source: Field survey by the author)

Table VII Details on River Dependence

Sl. No	Sample Villages	Fishing	Irrigation	Drinking	Communication	Waste Disposal	Recreation
1	Jakhalabandha	N	N	N	N	Y	N
2	Dhekiyal gaon	N	N	N	N	Y	N
3	Langichuk	Y	N	N	N	Y	N
4	Ouguri	Y	N	Y	N	Y	N
5	Tekelipota	Y	N	N	N	Y	N
6	Mikirhat	N	N	N	N	Y	N
7	Uriagaon	Y	N	N	N	Y	N
8	Khuti Katia	N	N	N	N	Y	N
9	Ghahigaon	Y	N	N	N	Y	N
10	Phulaguri	Y	N	N	N	Y	N
11	Kajalajan	N	N	N	N	N	N
12	Tupakuchi	Y	N	N	N	Y	N
13	Manipurtop	Y	N	N	N	Y	N
14	Damal	Y	N	N	N	Y	N
15	Barpak Chapari	N	N	N	N	Y	N
16	Jerenga Bari	Y	N	N	N	Y	N
17	Jagi	Y	Y	N	Y	Y	N
18	Gun Pathar	Y	N	N	N	Y	N
19	Moloibari Jungle	Y	Y	Y	Y	N	N
20	Barpak Jungle	Y	Y	N	Y	N	N
21	Theng Bhanga	Y	N	N	N	Y	N

(Source: Field survey by the author)

Table VIII Energy Use Pattern of the Sample Units

Sl. No	Sample Villages	LPG	Fuel Wood	Kerosene	Bio-gas	Electricity	Solar Energy
1	Jakhalabandha	Y	Y	Y	N	Y	N
2	Dhekiyal gaon	Y	Y	Y	Y	Y	N
3	Langichuk	Y	Y	Y	N	Y	N
4	Ouguri	Y	Y	Y	Y	Y	N
5	Tekelipota	Y	Y	Y	N	Y	N
6	Mikirhat	Y	Y	Y	N	Y	N
7	Uriagaon	Y	Y	Y	N	Y	Y
8	Khuti Katia	Y	N	N	N	Y	Y
9	Ghahigaon	Y	Y	Y	Y	Y	N
10	Phulaguri	Y	Y	Y	N	Y	N
11	Kajalajan	Y	Y	Y	N	Y	N
12	Tupakuchi	Y	Y	N	N	Y	N
13	Manipurtop	Y	Y	Y	N	Y	N
14	Damal	Y	Y	Y	N	Y	N
15	Barpak Chapari	Y	Y	Y	N	Y	N
16	Jerenga Bari	Y	Y	Y	N	Y	N
17	Jagi	Y	Y	Y	Y	Y	Y
18	Gun Pathar	Y	Y	Y	N	Y	N
19	Moloibari Jungle	Y	Y	Y	N	Y	N
20	Barpak Jungle	Y	Y	Y	N	Y	N
21	Theng Bhanga	Y	Y	Y	N	Y	N

(Source: Field survey by the author)

List of Publications

- 1) M. Bora, and D. C. Goswami, Journal of Environmental Research and Development **8**, 997 (2014).
- 2) M. Bora, and D. C. Goswami, Archives of Applied Science Research **7**, 110 (2015).
- 3) M. Bora, and D.C. Goswami, Applied Water Science (2016) DOI: 10.1007/s13201-016-0451-y.
- 4) M. Bora, and D.C. Goswami, IOSR Journal of Agriculture and Veterinary Science **9**, 36 (2016).
- 5) M. Bora, and D.C. Goswami, International Journal of Geomatics and Geosciences **6**, 1676 (2016).
- 6) M. Bora, and D.C. Goswami, Current Science **113**, 743 (2017).
- 7) M. Bora, and D.C. Goswami, RS-GIS based assessment of channel planform of the Kolong River, Assam (India) is communicated with *Journal of Indian Society of Remote Sensing (Springer)*