

Table 1.6.3-2 (1) DATA SHEET OF PUMPING TEST

Borehole No. AR 25797		District : Hanang		Villages : BASODESH		87 m	
Status : Constant Discharge		Pump Setting : SWL		Depth : 13.81 m		Date	
Act. Time	Elapsed Time (min)	t' (min)	Water Level (m)	Draw-Down (s)	Pumping Rate (liter/min)	Pumping Rate	Remarks
7:00 A.m	0.0	13.81	0.00		8000		
	0.5	14.10	0.29				
	1.0	14.25	0.44				
	1.5	14.40	0.59				
	2.0	14.67	0.86				
	2.5	14.80	0.99				
	3.0	14.95	1.14				
	3.5	15.17	1.36				
	4.0	15.37	1.46				
	4.5	15.57	1.56				
	5.0	16.77	2.96				
	6.0	17.03	3.22				
	7.0	17.25	3.44				
	8.0	17.35	3.54				
	9.0	17.51	3.70				
	10.0	17.53	3.72				
	11.0	17.53	3.72				
	12.0	17.60	3.79				
	13.0	17.63	3.82				
	14.0	17.71	3.90				
	15.0	17.73	3.92				
	20.0	17.76	3.95				
	25.0	17.77	3.95				
	30.0	17.79	3.98				
	35.0	17.82	4.01				
	40.0	17.85	4.04				
	45.0	17.87	4.06				
	50.0	17.89	4.08				
	105.0	17.91	4.10				
	120.0	17.93	4.12				
	135.0	17.93	4.12				
	150.0	17.94	4.13				
	165.0	17.94	4.13				
	180.0	17.95	4.14				
	210.0	17.96	4.15				
	240.0	17.97	4.16				
	300.0	17.97	4.16				
	330.0	18.00	4.19				
	360.0	18.05	4.24				
	420.0	18.15	4.34				
	480.0	18.28	4.47				
	540.0	18.31	4.50				
	600.0	18.37	4.56				
	660.0	18.50	4.69				
	720.0	18.62	4.81				
	780.0	18.71	4.90				
	840.0	18.82	5.01				
	900.0	18.74	4.93		8000		
	960.0	18.95	5.14				
	1020.0	18.74	4.93				
	1080.0	18.95	5.14				
	1140.0	19.01	5.20				

Basodeah Constant

Act. Time	Elapsed Time (min)	t' (min)	Water Level (m)	Draw-Down (s)	Pumping Rate (liter/min)	Pumping Rate	Remarks
	1200.0		19.03	5.22			
	1260.0		19.13	5.32			
	1320.0		19.19	5.38			
	1380.0		19.22	5.41	8000		
	1440.0		19.27	5.46			
	1440.5	0.5	19.65	3.84			
	1441.0	1.0	17.29	3.48			
	1441.5	1.5	16.94	3.13			
	1442.0	2.0	16.86	3.05			
	1442.5	2.5	16.75	2.94			
	1443.0	3.0	16.67	2.86			
	1443.5	3.5	16.60	2.79			
	1444.0	4.0	16.55	2.74			
	1444.5	4.5	16.52	2.71			
	1445.0	5.0	16.48	2.67			
	1446.0	6.0	16.42	2.61			
	1447.0	7.0	16.38	2.57			
	1448.0	8.0	16.33	2.52			
	1449.0	9.0	16.30	2.49			
	1450.0	10.0	16.27	2.46			
	1451.0	11.0	16.24	2.43			
	1452.0	12.0	16.21	2.40			
	1453.0	13.0	16.19	2.38			
	1454.0	14.0	16.17	2.36			
	1455.0	15.0	16.14	2.33			
	1460.0	20.0	16.03	2.22			
	1465.0	25.0	16.00	2.19			
	1470.0	30.0	15.95	2.14			
	1485.0	45.0	15.80	1.99			
	1500.0	60.0	15.70	1.89			
	1515.0	75.0	15.65	1.84			
	1530.0	90.0	15.62	1.81			
	1545.0	105.0	15.56	1.77			
	1560.0	120.0	15.49	1.68			
	1575.0	135.0	15.44	1.63			
	1590.0	150.0	15.43	1.62			
	1605.0	165.0	15.38	1.57			
	1620.0	180.0	15.36	1.55			
	1650.0	210.0	15.21	1.40			
	1680.0	240.0	15.27	1.46			
	1710.0	270.0	15.23	1.42			
	1740.0	300.0	15.21	1.40			
	1800.0	360.0	15.18	1.37			
	1860.0	420.0	15.17	1.36			
	1920.0	480.0	15.12	1.31			
	1980.0	540.0	15.10	1.29			
	2040.0	600.0	15.08	1.27			

Basodeah Constant

Table 1.6.3-2 (2) DATA SHEET OF PUMPING TEST

Borehole No	AR 25997	District	Hanang	Village	MASKARODA	
Status	Constant Discharge	Pump Setting	30 m	Depth	78 m	
Screen	SWL	0	Date		(/)	
Act. Time	Elapsed Time (t) (min)	t' (min)	Water Level (m)	Draw-Down (s)	Pumping Rate (liter/min)	Remarks
7:00 A.m	0.0	0.00	0.00	0.00	9000	artesian flow
	0.5	9.50	9.50	9.55		
	1.0	9.85	9.85	10.07		
	1.5	10.33	10.33			
	2.0	10.75	10.75			
	3.0	10.95	10.95			
	3.5	11.19	11.19			
	4.0	11.47	11.47			
	4.5	11.75	11.75			
	5.0	11.95	11.95			
	6.0	12.05	12.05			
	7.0	12.10	12.10			
	8.0	12.31	12.31			
	9.0	12.45	12.45			
	10.0	10.55	10.55			
	11.0	12.86	12.86			
	12.0	13.56	13.56			
	13.0	12.60	12.60			
	14.0	12.64	12.64			
	15.0	12.66	12.66			
	20.0	12.77	12.77		9000	
	25.0	12.99	12.99			
	30.0	13.15	13.15			
	45.0	13.45	13.45			
	60.0	13.75	13.75			
	75.0	14.75	14.75			
	90.0	14.60	14.60			
	105.0	14.82	14.82			
	120.0	15.00	15.00			
	135.0	16.00	16.00			
	150.0	16.11	16.11			
	165.0	16.22	16.22			
	180.0	16.55	16.55		7200	
	210.0	17.05	17.05			
	240.0	17.25	17.25			
	270.0	17.75	17.75			
	300.0	19.57	19.57			
	330.0	20.65	20.65			
	360.0	20.24	20.24			
	420.0	20.50	20.50			
	480.0	19.48	19.48			
	540.0	20.50	20.50			
	600.0	19.69	19.69			
	660.0	19.69	19.69			
	720.0	19.69	19.69			
	780.0	19.69	19.69			
	840.0	20.52	20.52			
	900.0	20.52	20.52			
	960.0	19.69	19.69			
	1020.0	19.70	19.70			
	1080.0	19.71	19.71			
	1140.0	20.53	20.53			

Maskaroda constant discharge

Act. Time	Elapsed Time (t) (min)	t' (min)	Water Level (m)	Draw-Down (s)	Pumping Rate (liter/min)	Remarks
	1200.0		20.52	20.52		
	1260.0		19.70	19.70		
	1320.0		19.72	19.72		
	1380.0		19.73	19.73		
	1440.0	0.5	19.66	19.66		pumping stopped
	1441.0	1.0	17.04	17.04		recovery
	1441.5	1.5	13.00	13.00		
	1442.0	2.0	9.80	9.80		
	1442.5	2.5	6.47	6.47		
	1443.0	3.0	5.27	5.27		
	1443.5	3.5	4.13	4.13		
	1444.0	4.0	3.56	3.56		
	1444.5	4.5	2.70	2.70		
	1445.0	5.0	1.78	1.78		
	1446.0	6.0	0.93	0.93		
	1447.0	7.0	0.00	0.00		artesian flow

Maskaroda constant discharge

Table 1.6.3-2 (3) DATA SHEET OF PUMPING TEST

Borehole No. : AR 2/60/97	District : Hanang	Village : MARA	Depth : 40 m
Status : Constant Discharge	Pump Setting : SWL=7.30	Date : (/ /)	

Act. Time	Elapsed Time (min)	t' (min)	Water Level (m)	Draw-Down (m)	Pumping Rate		Remarks
					(liter/min)	(m ³ /hr)	
7:00 A.m	0.0	0.0	7.30	0.00			
	0.5	0.35	7.65	0.35	9000		
	1.0	0.40	7.70	0.40			
	1.5	0.42	7.72	0.42			
	2.0	0.41	7.71	0.41			
	2.5	0.41	7.71	0.41			
	3.0	0.40	7.70	0.40			
	3.5	0.40	7.70	0.40			
	4.0	0.40	7.70	0.40			
	4.5	0.40	7.70	0.40			
	5.0	0.40	7.70	0.40			
	6.0	0.40	7.70	0.40			
	7.0	0.38	7.68	0.38			
	8.0	0.38	7.68	0.38			
	9.0	0.37	7.67	0.37			
	10.0	0.36	7.66	0.36			
	11.0	0.36	7.66	0.36			
	12.0	0.37	7.67	0.37			
	13.0	0.38	7.68	0.38			
	14.0	0.38	7.68	0.38			
	15.0	0.35	7.65	0.35			
	20.0	0.35	7.65	0.35			
	25.0	0.35	7.65	0.35			
	30.0	0.34	7.64	0.34			
	35.0	0.34	7.64	0.34			
	40.0	0.34	7.64	0.34			
	45.0	0.32	7.62	0.32			
	50.0	0.31	7.61	0.31			
	55.0	0.31	7.61	0.31			
	60.0	0.31	7.61	0.31			
	65.0	0.30	7.60	0.30			
	70.0	0.30	7.60	0.30			
	75.0	0.30	7.60	0.30			
	80.0	0.30	7.60	0.30			
	85.0	0.31	7.61	0.31			
	90.0	0.31	7.61	0.31			
	95.0	0.30	7.60	0.30			
	100.0	0.30	7.60	0.30			
	105.0	0.30	7.60	0.30			
	110.0	0.30	7.60	0.30			
	115.0	0.30	7.60	0.30			
	120.0	0.30	7.60	0.30			
	125.0	0.30	7.60	0.30			
	130.0	0.30	7.60	0.30			
	135.0	0.30	7.60	0.30			
	140.0	0.30	7.60	0.30			
	145.0	0.30	7.60	0.30			
	150.0	0.30	7.60	0.30			
	155.0	0.30	7.60	0.30			
	160.0	0.30	7.60	0.30			
	165.0	0.30	7.60	0.30			
	170.0	0.30	7.60	0.30			
	175.0	0.30	7.60	0.30			
	180.0	0.30	7.60	0.30			
	185.0	0.31	7.61	0.31			
	190.0	0.32	7.62	0.32			
	195.0	0.32	7.62	0.32			
	200.0	0.32	7.62	0.32			
	205.0	0.32	7.62	0.32			
	210.0	0.32	7.62	0.32			
	215.0	0.32	7.62	0.32			
	220.0	0.32	7.62	0.32			
	225.0	0.32	7.62	0.32			
	230.0	0.32	7.62	0.32			
	235.0	0.32	7.62	0.32			
	240.0	0.32	7.62	0.32			
	245.0	0.32	7.62	0.32			
	250.0	0.32	7.62	0.32			
	255.0	0.32	7.62	0.32			
	260.0	0.32	7.62	0.32			
	265.0	0.32	7.62	0.32			
	270.0	0.32	7.62	0.32			
	275.0	0.32	7.62	0.32			
	280.0	0.32	7.62	0.32			
	285.0	0.32	7.62	0.32			
	290.0	0.32	7.62	0.32			
	295.0	0.32	7.62	0.32			
	300.0	0.32	7.62	0.32			

Act. Time	Elapsed Time (min)	t' (min)	Water Level (m)	Draw-Down (m)	Pumping Rate		Remarks
					(liter/min)	(m ³ /hr)	
	840.0		7.62	0.32			
	900.0		7.62	0.32			
	960.0		7.63	0.33			
	1020.0		7.62	0.32			
	1080.0		7.63	0.33			
	1140.0		7.63	0.33			
	1200.0		7.63	0.33			
	1260.0		7.63	0.33			
	1320.0		7.63	0.33			
	1380.0		7.63	0.33	9000		
	1440.0	0.5	7.63	0.33			Pumping stopped
	1441.0	1.0	7.63	0.33			Recovery
	1441.5	1.5	7.51	0.21			
	1442.0	2.0	7.50	0.20			
	1442.5	2.5	7.49	0.19			
	1443.0	3.0	7.48	0.18			
	1443.5	3.5	7.49	0.19			
	1444.0	4.0	7.46	0.16			
	1444.5	4.5	7.46	0.16			
	1445.0	5.0	7.46	0.16			
	1445.0	6.0	7.45	0.15			
	1447.0	7.0	7.45	0.15			
	1448.0	8.0	7.45	0.15			
	1449.0	9.0	7.45	0.15			
	1450.0	10.0	7.45	0.15			
	1451.0	11.0	7.45	0.15			
	1452.0	12.0	7.45	0.15			
	1453.0	13.0	7.45	0.15			
	1454.0	14.0	7.45	0.15			
	1455.0	15.0	7.44	0.14			
	1460.0	20.0	7.44	0.14			
	1465.0	25.0	7.43	0.13			
	1470.0	30.0	7.42	0.12			
	1485.0	35.0	7.40	0.10			
	1500.0	60.0	7.39	0.09			
	1515.0	75.0	7.38	0.08			
	1530.0	90.0	7.36	0.06			
	1545.0	105.0	7.35	0.05			
	1560.0	120.0	7.34	0.04			
	1575.0	135.0	7.34	0.04			
	1590.0	150.0	7.33	0.03			
	1605.0	165.0	7.33	0.03			
	1620.0	180.0	7.33	0.03			
	1650.0	210.0	7.32	0.02			
	1680.0	240.0	7.32	0.02			
	1710.0	270.0	7.32	0.02			
	1740.0	300.0	7.32	0.02			

Table 1.6.3-2 (4) DATA SHEET OF PUMPING TEST

Borehole No.: SG 255/97		District: Singida		Village: NKUHI		
Status: Constant Discharge Test		Pump Setting:		Depth	100 m	
Screen:	SWL	19.8	Date			
Act. Time	Elapsed Time (min)	(°)	Water Level (m)	Draw-Down (s)	Pumping Rate	Remarks
		(min)	(m)	(m)	(liter/hr)	
	0.0		39.80	0.00		
	0.5		44.38	4.58	4800	
	1.0		44.38	4.58		
	1.5		44.35	4.55		
	2.0		44.34	4.54		
	2.5		44.34	4.54		
	3.0		44.33	4.53		
	3.5		44.30	4.50		
	4.0		44.30	4.50		
	4.5		44.30	4.50		
	5.0		44.30	4.50		
	6.0		44.27	4.47		
	7.0		44.25	4.45		
	8.0		44.22	4.42		
	9.0		44.29	4.49		
	10.0		44.35	4.55		
	11.0		44.75	4.95		
	12.0		44.93	5.13		
	13.0		45.20	5.40	4800	
	14.0		46.02	6.22		
	15.0		46.10	6.30		
	20.0		46.30	6.50		
	25.0		46.57	6.77		
	30.0		46.78	6.98		
	45.0		47.07	7.27		
	60.0		47.54	7.74		
	75.0		47.60	7.80		
	90.0		47.60	7.80		
	105.0		47.53	7.73		
	120.0		47.55	7.75		
	135.0		50.83	11.03	7200	
	150.0		51.20	11.40		
	165.0		51.42	11.62		
	180.0		51.44	11.64		
	210.0		52.20	12.40		
	240.0		52.25	12.45		
	270.0		52.65	12.85		
	300.0		52.80	13.00		
	330.0		52.82	13.02		
	360.0		52.84	13.04		
	420.0		52.96	13.16		
	480.0		53.07	13.27		
	540.0		53.07	13.27		
	600.0		53.09	13.29		

Nkuhi Constant

Act. Time	Elapsed Time (min)	(°)	Water Level (m)	Draw-Down (s)	Pumping Rate	Remarks
	(min)	(min)	(m)	(m)	(liter/hr)	
	720.0		53.09	13.29		
	780.0		53.09	13.29		
	840.0		53.10	13.30		
	900.0		53.10	13.30		
	960.0		53.11	13.31		
	1020.0		53.11	13.31		
	1080.0		53.11	13.31		
	1140.0		53.12	13.32		
	1200.0		53.12	13.32		
	1260.0		53.12	13.32		
	1320.0		53.12	13.32		
	1380.0		53.12	13.32		
	1440.0	0.5	49.50	9.70		Pumping stopped
	1441.0	1.0	47.80	8.00		Recovery
	1441.5	1.5	47.10	7.30		
	1442.0	2.0	42.60	2.80		
	1442.5	2.5	42.20	2.40		
	1443.0	3.0	41.90	2.10		
	1443.5	3.5	41.70	1.90		
	1444.0	4.0	41.50	1.80		
	1444.5	4.5	41.50	1.80		
	1445.0	5.0	41.40	1.36		
	1446.0	6.0	41.40	1.26		
	1447.0	7.0	41.39	1.17		
	1448.0	8.0	41.39	1.12		
	1449.0	9.0	41.39	1.06		
	1450.0	10.0	41.36	1.01		
	1451.0	11.0	40.77	0.97		
	1452.0	12.0	40.75	0.95		
	1453.0	13.0	40.71	0.91		
	1454.0	14.0	40.67	0.87		
	1455.0	15.0	40.64	0.84		
	1460.0	20.0	40.53	0.73		
	1465.0	25.0	40.46	0.66		
	1470.0	30.0	40.40	0.60		
	1485.0	45.0	40.38	0.58		
	1500.0	60.0	40.35	0.55		
	1515.0	75.0	40.33	0.53		
	1530.0	90.0	40.32	0.52		
	1545.0	105.0	40.30	0.50		
	1560.0	120.0	40.29	0.49		
	1575.0	135.0	40.28	0.48		
	1590.0	150.0	40.28	0.48		
	1605.0	165.0	40.27	0.47		
	1620.0	180.0	40.27	0.47		

Nkuhi Constant

Table 1.6.3-2 (5) DATA SHEET OF PUMPING TEST

Borehole No	SG 25697	District	Village	CHODA		
				Depth	102 m	
Status	Constant Discharge	Pump Setting : 60 m	SWL	25.67 m	Date	
Screen :						
Act. Time	Elapsed Time (min)	t' (min)	Water Level (m)	Draw-Down (s)	Pumping Rate (liter/min)	Remarks
7:00 A.m	0.5	0.0	25.67	0.00	9000	
	1.0	2.0	27.67	2.00		
	1.5	2.0	27.72	2.05		
	2.0	2.0	27.89	2.22		
	2.5	2.0	27.86	2.19		
	3.0	2.0	27.90	2.23		
	3.5	2.0	27.92	2.25		
	4.0	2.0	27.94	2.27		
	4.5	2.0	28.05	2.38		
	5.0	2.0	28.06	2.39		
	6.0	2.0	28.14	2.47		
	7.0	2.0	28.20	2.53		
	8.0	2.0	28.22	2.55		
	9.0	2.0	28.24	2.57		
	10.0	2.0	28.24	2.57		
	11.0	2.0	28.25	2.58		
	12.0	2.0	28.26	2.59		
	13.0	2.0	28.27	2.60		
	14.0	2.0	28.28	2.61		
	15.0	2.0	28.29	2.62		
	20.0	2.0	28.30	2.63	9000	
	25.0	2.0	28.32	2.65		
	30.0	2.0	28.33	2.66		
	45.0	2.0	28.34	2.67		
	60.0	2.0	28.36	2.69		
	75.0	2.0	28.38	2.71		
	90.0	2.0	28.39	2.72		
	105.0	2.0	28.40	2.73		
	120.0	2.0	28.40	2.73		
	135.0	2.0	28.42	2.75		
	150.0	2.0	28.43	2.76		
	165.0	2.0	28.43	2.76		
	180.0	2.0	28.45	2.78	9000	
	210.0	2.0	28.45	2.78		
	240.0	2.0	28.45	2.78		
	270.0	2.0	28.46	2.79		
	300.0	2.0	28.46	2.79		
	330.0	2.0	28.46	2.79		
	360.0	2.0	28.46	2.79		
	420.0	2.0	28.46	2.79		
	480.0	2.0	28.46	2.79		
	540.0	2.0	28.46	2.79		
	600.0	2.0	28.46	2.79		
	660.0	2.0	28.46	2.79		
	720.0	2.0	28.46	2.79		
	780.0	2.0	28.46	2.79		
	840.0	2.0	28.46	2.79		
	900.0	2.0	28.46	2.79		
	960.0	2.0	28.46	2.79		
	1020.0	0.5	26.36	0.69		
	1021.0	1.0	26.14	0.47		

Choda constant discharge

Act. Time	Elapsed Time (min)	t' (min)	Water Level (m)	Draw-Down (s)	Pumping Rate (liter/min)	Remarks
	1021.5	1.5	26.09	0.42		
	1022.0	2.0	26.04	0.37		
	1022.5	2.5	26.00	0.33		
	1023.0	3.0	25.95	0.28		
	1023.5	3.5	25.94	0.27		
	1024.0	4.0	25.93	0.26		
	1024.5	4.5	25.91	0.26		
	1025.0	5.0	25.92	0.25		
	1026.0	6.0	25.90	0.23		
	1028.0	8.0	25.89	0.22		
	1029.0	9.0	25.87	0.20		
	1030.0	10.0	25.86	0.19		
	1031.0	11.0	25.86	0.19		
	1032.0	12.0	25.85	0.18		
	1033.0	13.0	25.84	0.17		
	1034.0	14.0	25.84	0.17		
	1035.0	15.0	25.80	0.13		
	1040.0	20.0	25.80	0.13		
	1045.0	25.0	25.75	0.08		
	1050.0	30.0	25.71	0.04		
	1055.0	45.0	25.69	0.02		
	1060.0	60.0	25.68	0.01		
	1095.0	75.0	25.67	0.00		
	1110.0	90.0	25.67	0.00		
	1125.0	105.0	25.67	0.00		
	1140.0	120.0	25.67	0.00		

Choda constant discharge

Table 1.6.3-2 (6)

DATA SHEET OF PUMPING TEST

Borehole No. : SG 252/97	District : Manyoni	Village : CHIKOLA
Status : Constant Discharge Test	Pump Setting : 104 Depth	150 m
Screen :	SWL :	Date : 1964

Act. Time	Elapsed Time (min)	Flow (l/min)	Water Level (m)	Draw-Down (m)	Pumping Rate		Remarks
					(liter/hr)	(l/min)	
	0.0	19.64	0.00	0.21	1000		
	0.5	19.85	0.21	0.39			
	1.0	20.03	0.46	0.86			
	1.5	20.10	0.86	1.11			
	2.0	20.30	1.11	1.36			
	2.5	20.75	1.36	1.81			
	3.0	21.00	1.81	2.11			
	3.5	21.45	2.11	2.31			
	4.0	21.75	2.31	2.44			
	4.5	21.95	2.44	2.66			
	5.0	22.08	2.66	3.11			
	6.0	22.30	3.11	3.31			
	7.0	22.75	3.31	3.45			
	8.0	22.95	3.45	3.61			
	9.0	23.09	3.61	4.46			
	10.0	23.25	4.46	4.61			
	11.0	23.75	4.61	4.71			
	12.0	24.10	4.71	5.86			
	13.0	24.25	4.71	6.36			
	14.0	24.35	4.71	6.96			
	15.0	24.40	4.76	7.11			
	20.0	25.50	5.86	8.11			
	25.0	26.00	6.36	9.66			
	30.0	26.60	6.96	10.51			
	40.0	26.75	7.11	10.61			
	50.0	27.75	8.11	11.11			
	60.0	29.30	9.66	11.11			
	70.0	30.15	10.51	12.01			
	80.0	30.25	10.61	13.19			
	90.0	30.50	10.86	15.26			
	100.0	30.75	11.11	17.16			
	110.0	31.65	12.01	18.74			
	120.0	32.83	13.19	20.21			
	130.0	34.98	15.26	23.27			
	140.0	36.80	17.16	25.50			
	150.0	38.38	18.74	27.47			
	160.0	39.85	20.21	29.09			
	170.0	42.91	23.27	31.68			
	180.0	45.14	25.50	33.89			
	190.0	47.11	27.47	34.21			
	200.0	48.71	29.09				
	210.0	51.32	31.68				
	220.0	53.53	33.89				
	230.0	53.85	34.21				

Chokola constant

Act. Time	Elapsed Time (min)	Flow (l/min)	Water Level (m)	Draw-Down (m)	Pumping Rate		Remarks
					(liter/hr)	(l/min)	
	600.0		54.09	34.45			
	660.0		54.75	35.11			
	720.0		55.25	35.61			
	780.0		55.60	35.96			
	840.0	0.0	55.80	36.16			Pumping stopped
	840.5	0.5	55.38	35.74			Recovery
	841.0	1.0	55.09	35.45			
	841.5	1.5	54.94	35.30			
	842.0	2.0	54.62	34.98			
	842.5	2.5	54.44	34.80			
	843.0	3.0	54.20	34.56			
	843.5	3.5	53.94	34.30			
	844.0	4.0	53.80	34.16			
	844.5	4.5	53.60	33.96			
	845.0	5.0	53.50	33.66			
	846.0	6.0	53.24	33.60			
	847.0	7.0	51.90	32.26			
	848.0	8.0	50.90	31.26			
	849.0	9.0	50.10	30.46			
	850.0	10.0	49.12	29.48			
	851.0	11.0	48.54	28.90			
	852.0	12.0	48.08	28.44			
	853.0	13.0	46.88	27.24			
	854.0	14.0	46.29	26.65			
	855.0	15.0	45.44	25.80			
	860.0	20.0	38.38	18.74			
	865.0	25.0	36.20	16.56			
	870.0	30.0	34.22	14.58			
	885.0	45.0	29.48	9.84			
	900.0	60.0	26.54	6.90			
	915.0	75.0	24.74	5.10			
	930.0	90.0	20.79	1.15			
	945.0	105.0	20.35	0.71			
	960.0	120.0	20.15	0.51			
	975.0	135.0	20.05	0.41			
	990.0	150.0	19.85	0.21			

Chokola constant

Table 1.6.3-2 (7) DATA SHEET OF PUMPING TEST

Borehole No. SG 251/97	District : Mwanoni	Village : Mpapa
Status : Constant Discharge Test	Pump Setting : 34.4	Depth : 120 m
Screen :	SWL	Date

Act. Time	Elapsed Time (min)	(°)	Water Level (m)	Draw-Down (m)	Pumping Rate (liter/hr)	Remarks
	0.0		34.40	0.00		
	0.5		37.05	2.65	660	
	1.0		37.55	3.15		
	1.5		37.90	3.50		
	2.0		38.20	3.80		
	2.5		38.75	4.35		
	3.0		39.10	4.70		
	3.5		39.20	4.80		
	4.0		39.30	4.90		
	4.5		40.15	5.75		
	5.0		40.30	5.90		
	6.0		40.75	6.35		
	7.0		41.00	6.60		
	8.0		41.45	7.05		
	9.0		41.80	7.40		
	10.0		42.00	7.60		
	11.0		42.20	7.80		
	12.0		42.25	7.85		
	13.0		42.70	8.30		
	14.0		43.00	8.60		
	15.0		43.45	9.05		
	20.0		43.60	9.20		
	25.0		43.75	9.35		
	30.0		44.10	9.70		
	45.0		44.25	9.85	420	
	60.0		44.60	10.20		
	75.0		44.80	10.40		
	90.0		45.10	10.70		
	105.0		45.40	11.00		
	120.0		45.70	11.30		
	135.0		46.00	11.60		
	150.0		46.80	12.40		
	165.0		47.20	12.80		
	180.0		47.25	12.85		
	210.0		47.30	12.90		
	240.0		47.55	12.95		
	270.0		47.40	13.00		
	300.0		47.56	13.16	250	
	330.0		47.60	13.20		
	360.0		47.80	13.40		
	420.0		47.90	13.50		
	480.0		48.01	13.61		
	540.0		48.09	13.69		
	600.0		48.12	13.72	150	

Act. Time	Elapsed Time (min)	(°)	Water Level (m)	Draw-Down (m)	Pumping Rate (liter/hr)	Remarks
	660.0		48.15	13.75		
	720.0		48.20	13.80		
	780.0		47.90	13.50		
	840.0		46.10	11.70		
	900.0		45.80	11.40		
	960.0		44.30	9.90		
	1020.0		44.00	9.60		
	1080.0		43.70	9.30		
	1140.0		42.90	8.50		
	1200.0		41.60	7.20		
	1260.0		41.00	6.60		
	1320.0		40.60	6.20		
	1380.0		39.80	5.40		
	1440.0		38.30	3.90		
	1500.0		38.00	3.60		
	1560.0		37.70	3.30		
	1620.0		36.00	2.51		
	1680.0		35.40	1.93		
	1740.0		36.00	1.61		
	1800.0		35.40	1.26		
	1860.0		35.48	1.08		
	1920.0		35.32	0.92		
	1980.0		35.25	0.85		
	2040.0		35.09	0.69		
	2100.0		34.93	0.53		
	2160.0		34.84	0.44		
	2220.0		34.81	0.41		
	2280.0		34.78	0.38		
	2340.0		34.75	0.35		
	2400.0		34.73	0.33		
	2460.0		34.71	0.31		
	2520.0		34.70	0.30		

Table-1.6.6-4(1) Water Quality of Target Villages in Hanang District, Arusha Region

Division	Ward	No.	Village Name	Sample		Grids		Color	Muddiness	Smell	Temperature	pH	EC (mS/m)	F ppm	NO3 ppm	NO2 ppm	NH4 ppm	Colon Bacillus		Remarks		
				Point	Source	X	Y											Bacillus No.	Paper Water Sp.			
Bassoru	Bassoru	1	Muibadaw	734083	9415286	0	1	1	20.50	9.62	63.70	5							56			
		1	Muibadaw	731810	9516351	0	1	1	21.30	9.72	63.80	5							40			
		1	Muibadaw	733727	9519377	0	1	1	21.60	8.63	98.60	5							5			
		2	Dang'aida	722901	9521348	0	1	1	21.20	10.19	579.00	5							200			
		2	Dang'aida	723012	9521930	0	1	1	23.30	9.92	721.00	5							200			
		3	Dajamet	735.014	9497.651					19.30	6.75	20.00								200		
		3	Dajamet	729906	9496183	1	1	1	22.50	8.20	16.27	2							12			
		4	Laghanga	729663	9496690	1	1	1	22.90	8.82	16.45	5							20			
		5	Gawidu	724962	9502400																	
		6	Garawja	726131	9527597	0	1	0	1	0	24.60	9.90	90.30	1						200		
		6	Garawja	726444	9525819	0	0	0	0	0	23.10	9.22	92.70	1						200		
		7	Bassodesh	736466	9525312						21.10	8.40	31.50								1	Pilot V
		8	Hirbadaw	709663	9518467	1	1	0	1	0	24.40	9.27	7.88	1						32		
		8	Hirbadaw	709924	9518602	1	1	0	1	0	25.80	9.26	8.46	1						62		
		8	Hirbadaw	709638	9518458	1	1	0	1	0	22.60	9.51	8.99	1						200		
		9	Mwanga	711310	9525646	0	0	0	0	0	22.30	7.69	91.60	2						0		
		9	Mwanga	712675	9525538	1	1	0	1	0	25.50	8.33	169.80	5						200		
10	Wandela	717950	9519968	0	0	0	0	0	22.80	10.88	81.30	2						16				
10	Wandela	717658	9523680	2	0	0	1	1	19.90	10.95	384.00	2						25				
11	Gatanuwas																					
11	Gatanuwas																					
12	Gidika	722052	9508379	0	0	0	0	0	28.20	11.10	68.80	5						10				
12	Gidika	721375	9506736	2	2	1	1	1	23.40	10.63	130.30	2						35				
13	Dumbeta	766017	9503510	0	0	0	0	0	13.00	11.43	23.60	5						35				
13	Dumbeta	765282	9496982	0	0	0	0	0	22.60	11.07	24.30	5						0				
13	Dumbeta	764990	9495429	0	0	0	0	0	18.10	10.79	24.60	5						22				
14	Dirma																					
14	Dirma																					
15	Gisambalang	773527	9469100	1	2	1	2	1	25.70	10.38	25.30	1						40				
15	Gisambalang	774700	947007	1	1	0	1	0	19.70	10.34	27.40	2						38				
15	Gisambalang	774700	947007	1	1	0	1	0	19.70	10.34	27.40	2						38				
16	Waranga	777164	9472523	1	1	0	1	0	24.60	9.42	9.03	1						71				
16	Waranga	779011	9472791	1	1	0	1	0	19.00	9.68	10.09	2						52				
16	Waranga	779084	9472788	2	1	0	1	0	25.60	9.70	25.40	0.5						9				
17	Murero								18.60	10.34	6.37							0				
17	Murero								23.40	9.06	230.00							52				

Division	Ward	No.	Village	Sample		Gride		Color	Muddiness	Smell	Temperature C	pH	EC (mS/m)	F ppm	NO3 ppm	NO2 ppm	NH4 ppm	Colon Bacillus Paper	Colon Bacillus Water Sp.	Remarks		
				Point	Source	X	Y															
Endasak	Gidahababieg	17	Murero	Dug Well		753944	9485788				21.30	8.88	278.00							0		
		18	Diloda	House hold		757691	9469889	1	1	0	22.00	9.51	9.06	1					13			
		18	Diloda	Water hole		754951	946918	1	1	0	23.30	9.22	11.36	1					16			
		19	Mingenvi	House hold		747651	9491751	0	1	0	21.50	8.65	50.50	2					56			
		20	Ishponga	House hold							20.90	8.89	23.80									
		20	Ishponga	Dug Well/STW			734532	9488765			23.00	7.76	54.00								6	Pilot V
		21	Mara	River & Water hole			776472	9507317			23.10	8.44	39.10									
		21	Mara	Water hole			778621	9507761			22.20	7.75	102.10								49	Pilot V
		22	Gidahababieg	Charco/Dam			786215	9505178	2	1	0	24.30	11.75	80.10	5					37		
		22	Gidahababieg	House hold			786231	9504998	0	0	0	20.60	10.82	189.80	5					0		
		22	Gidahababieg	Borehole			784418	9505126	0	0	0	23.10	10.75	192.40	5					4		
		23	Endasaboghechan	Water hole			787440	9509819	1	1	0	20.40	9.38	15.68	1					21		
		23	Endasaboghechan	House hold			786903	9510535	1	1	0	19.40	9.38	15.68	1					13		
		24	Hidet	Water hole			779273	9505720	0	1	0	23.00	10.46	92.50	5					35		
		24	Hidet	House hold			780317	9504187	0	0	0	20.60	10.74	97.40	5					0		
		25	Bassonghang	River & Lake Ba			777189	9502049	0	1	0	23.50	12.18	12.90	5					95		
		25	Bassonghang	Water hole			778472	9505376	0	0	0	23.20	10.70	66.60	5					6		
		25	Bassonghang	House hold			778457	9503618	0	0	0	27.60	10.56	83.90	5					16		
		Sirop	26	Sirop	Water hole			790997	9492058	1	1	0	24.00	9.66	18.69	1					38	
26	Sirop		House hold			791316	9491798	1	1	0	23.40	9.85	19.07	1					12			
26	Sirop		House hold			791316	9491798	0	0	0	22.20	9.93	60.80	0.5					19			
26	Sirop		Borehole			793063	9493766	0	0	0	24.10	9.41	63.30	0.5					0			
27	Matangarinu		Water hole			788324	9487439	1	2	1	18.40	9.95	8.47	2					18			
27	Matangarinu		House hold			788613	9484828	1	1	1	16.70	10.37	34.00	5					200			
Simbay	27	Matangarinu	Dug Well			788527	9482820	0	0	0	21.50	9.67	35.10	1					0			
	28	Simbay	Water hole			784851	9491578	1	2	1	21.70	10.15	13.38	1					15			
	28	Simbay	House hold			783674	9494713	1	1	0	21.00	10.48	20.70	2					200			
	29	Gidagarabuk	House hold			793457	9501347	0	0	0	21.40	11.29	33.60	1					6			
	29	Gidagarabuk	River & River (B)			794184	9502160	0	2	0	27.40	11.38	34.20	1					23			
	30	Masakta	House hold/Dug Well							18.50	7.06	10.20								200		
Masakta	30	Masakta	House hold/Rain W			783162	9525553			18.90	7.89	18.24							24			
	30	Masakta	Water hole						22.10	6.92	42.10								0			
	30	Masakta	Water hole			781764	9526291			20.60	7.03	44.90							8			
	31	Lambo	Water hole			781484	9525990	0	0	0	23.00	9.12	29.70	0.5					90			
	31	Lambo	Water hole			781078	9526013	0	0	0	24.80	9.67	39.60	0.5					5			
	31	Lambo	House hold			779468	9524537	0	0	0	20.00	10.51	52.60	1					70			
Maskaroda	32	Maskaroda	House hold/Rain Water						19.00	7.89	1.88								0			
	32	Maskaroda	House hold/Dug Well						19.80	8.38	131.00								2			

Division	Ward	No.	Village Name	Sample		Grade		Color	Muddiness	Smell	Temperature C	pH	EC (mS/m)	F ppm	NO3 ppm	NO2 ppm	NH4 ppm	Colon		Remarks
				Point	Source	X	Y											Bacillus No.	Water Sp.	
		32	Maskaroda	Dug Well		783.902	9516.827				21.70	8.31	168.70						0	Pilot V
		33	Getasum	Water hole		784129	9515166	1	1	0	23.70	10.88	86.80	5				10		
		33	Getasum	House hold		785727	9514581	0	0	0	22.00	10.75	91.20	5				25		
		33	Getasum	Water hole		784036	9515169	0	0	0	26.00	11.04	92.40	5				0		
		Total																		

Table-1.6.6-4 (2) Water Quality of Target Villages in Singida Rural District, Singida Region

Division	Ward	No.	Village Name	Sample		Grid		Color	Muddiness	Smell	Temperature	pH	EC (ms/m)	F ppm	NO3 ppm	NO2 ppm	NH4 ppm	Colon Bacillus		Remarks		
				Point	Source	X	Y											Paper	Water Sp.			
Ikungi	Ikungi	1	Ikungi	Water hole	690650	9431767	0	0	0	22.20	8.08	16.00						10				
		1		House hold	696244	9432404	0	2	0	20.50	8.55	12.40							90			
		2		Dug Well	696208	9434902	0	0	0	22.00	7.46	15.89								101		
		2		House hold	696289	9435151	0	0	0	19.60	7.82	16.25								13		
		2		Dug Well	696437	9435736	0	0	0	21.80	7.84	18.77										
		2		Dug Well	695783	9434259	0	0	0	24.30	9.28	36.80										
		3		House hold	697832	9425024	0	0	0	23.00	8.60	50.40								1		
		3		Dug Well	697482	9425605	0	0	0	23.80	8.40	50.70								0		
		3		Borehole	697147	9424608	0	0	0	26.70	9.46	66.30								0		
		3		Dug Well	697152	9424519	0	0	0	23.60	9.63	69.10								1		
		4		Water hole	689465	9426055	0	2	2	19.40	8.40	34.60								1		
		4		House hold	689496	9426164	0	2	2	19.20	8.38	35.00								0		
4	Borehole	691489	9426384	0	0	0	25.90	10.50	77.50								0					
4	Dug Well	690645	9427511	0	0	0	24.50	9.24	308.00								0					
5	Dug Well	696556	9430241	0	0	0	21.50	8.85	33.30								2					
5	House hold	697520	9429465	0	0	0	19.70	9.23	90.20								3					
5	Dug Well	697520	9429455	0	0	0	23.00	8.93	90.80								2					
5	Water hole	696626	9430224	0	0	0	21.60	9.47	58.60								18					
6	Dug Well	705890	9429731	0	0	0	23.20	8.90	38.70								0					
6	House hold	705761	9429746	0	0	0	23.10	8.99	38.90								0					
6	Dug Well	706141	9429594	0	0	0	23.40	9.05	40.40								1					
7	Water hole	701560	9429841	1	1	1	23.10	8.80	25.00								4					
7	Dug Well	700697	9430318	0	0	0	26.40	8.67	46.80								0					
7	House hold	700697	9430318	0	0	0	21.10	8.93	49.30								0					
8	House hold	695653	9404813	1	2	2	21.00	9.36	10.30								3					
8	Charco Dam	694794	9403921	1	2	2	20.20	9.56	10.60								1					
8	Water hole	697090	9405923	1	2	2	22.50	9.79	58.50													
9	Water hole	695542	9389575				22.50	6.00	6.77													
9	Water hole	695542	9389575				21.00	7.30														
9	Water hole	684065	9386238	1	0	0	23.40	7.87	18.00								50		Pilot Villa			
10	Water hole	684294	9386346	2	2	2	23.40	8.58	34.40								50					
10	House hold	684083	9386722	0	0	0	20.60	8.82	51.40								0					
10	Borehole	684050	9386681	0	0	0	23.70	7.74	52.60								0					
10	Dug Well	688873	9391202	0	0	0	24.70	7.56	71.20								50					
10	Charco Dam	683714	9386515	2	2	2	20.10	9.22	78.40													
11	Charco Dam	697341	9409615		0	0	25.70	7.39														
12	Water hole	699255	9434706	1	0	1	19.90	8.33	10.26									0				

Division	Ward	No.	Village Name	Sample		Grid		Color	Muddiness	Smell	Temperature C	pH	EC (mS/m)	F ppm	NO3 ppm	NO2 ppm	NH4 ppm	Colon Bacillus		Remarks		
				Point	Source	X	Y											Paper	Water Sp.			
Mangonyi	Samaka	12	Samaka	Dug Well	702856	9435513	0	0	0	23.70	9.24	34.30						1				
		12		House hold	702856	9435513	0	0	0	19.70	9.68	35.20							0			
	Ujaire	13	Ujaire	Water hole	710274	9437650	1	2	0	20.00	8.60	11.25							0			
		13		Dug Well	709739	9437708	0	0	0	23.40	8.87	39.80							0			
	Kipumbuiko	13	Ujaire	House hold	709739	9437708	0	0	0	22.50	9.06	40.60							1			
		14		Water hole	695933	9436965	1	0	0	19.30	9.22	14.23							8			
	Kipumbuiko	14	Kipumbuiko	Dug Well	695066	9438897	0	0	0	23.80	9.69	65.20							0			
		15		House hold	701895	9438710	1	0	0	18.60	9.13	13.50							11			
	Mkinya	15	Mkinya	Dug Well	701895	9438710	1	0	0	22.30	8.80	13.77							15			
		15		Dug Well	700210	9437742	0	0	0	20.20	8.49	13.63							4			
	Ihanja	Mangonyi	16	Mangonyi	Borehole	12472	9481666				23.59	7.02	250.00							48	Pilot Villa	
			17		Water hole	714879	9417698	0	0	0	21.60	7.99	56.60							8		
		Tupendane	17	Tupendane	House hold	714852	9417634	0	0	0	24.10	9.90	110.90							3		
			18		Dug Well	711368	9422295	0	0	0	24.30	6.79	50.40							16		
		Sambu	19	Sambu	Water hole	733018	9415932	0	0	0	32.60	10.95	354.00							0		
19			Borehole		730219	9420736	0	0	0	26.30	9.74	103.80							0			
Ihanja		20	Ihanja	Water hole	685518	9442045	1	0	0	22.90	8.31	14.95							67			
		20		Borehole	687277	9440300	0	0	0	22.20	9.90	131.40							0			
Isseke		21	Isseke	Water hole	686985	9439723	1	0	1	20.20	8.24	5.04							0			
		21		House hold	687008	9439747	0	0	0	22.00	9.11	6.03							0			
Isseke		21	Isseke	Dug Well	687393	9438980	0	0	0	22.70	8.72	6.21							0			
		22		Water hole	685510	9435374	0	0	0	19.00	9.88	56.00							7			
Nkoiree		22	Nkoiree	House hold	685633	9434970	0	0	0	21.70	9.99	61.50							7			
		22		Dug Well	685633	9434970	1	0	0	23.60	9.73	62.80							7			
Unyangwe		23	Unyangwe	Dug Well	687921	9444017	0	0	0	22.10	8.74	11.15							0			
	23	House hold		687832	9444350	0	0	0	19.10	9.08	11.65							3				
Unyangwe	23	Unyangwe	Water hole	687919	9444017	0	0	0	21.70	8.38	20.00											
	24		Water hole	684746	9447444	1	0	0	22.80	8.15	24.80											
Chungu	24	Chungu	Dug Well	685178	9447212	0	0	0	25.10	7.95	74.60							52				
	25		Dug Well	672043	9450889	0	0	0	27.20	9.72	86.30							0				
Minyughe	25	Minyughe	Water hole	672435	9450548	1	1	0	21.80	10.60	97.40											
	26		Water hole	670345	9449686	0	0	0	25.00	9.54	45.40							12				
Muhintri	27	Muhintri	Dug Well	680301	9428321	1	0	0	23.40	8.11	16.22							1				
	27		Water hole	679294	9428740	0	0	0	20.40	8.51	21.70											
Mnyange	27	Mnyange	House hold	680164	9424975	0	0	0	21.20	10.39	44.50											
	28		Water hole	670130	9417321	1	2	1	19.70	8.56	10.44								61			
Mpetu	28	Mpetu	House hold	670130	9417321	0	1	0	21.40	10.44	88.10											
	29		House hold	684163	9428500	1	1	1	19.10	8.80	15.13								21			
Puma	29	Puma	Water hole	684136	9428475	1	1	1	20.90	8.74	18.34											
	30		Water hole	688221	9453309	1	1	1	21.50	8.45	12.32											

Division	Ward	No.	Village Name	Sample		Grids		Color	Muddiness	Smell	Temperature C	pH	EC (mS/m)	F ppm	NO3 ppm	NO2 ppm	NH4 ppm	Colon Bacillus		Remarks
				Point	Source	X	Y											Paper	Water Sp.	
		30	Maruku	Borehole		688120	9454702	0	0	0	24.10	9.47	118.40					0	0	
		31	Utaho	Dug Well		695419	9448337	0	0	0	23.90	9.09	34.30					0	0	
		31	Utaho	House hold		694444	9450201	0	0	0	19.30	9.63	36.60					0	0	
		32	Isalanda	Dug Well		695207	9448681	0	0	0	23.40	9.04	22.50					0	0	
		32	Isalanda	Water hole		695218	9448682	0	0	0	18.50	9.40	30.30					0	0	
		33	Kinutu	Water hole		693710	9447083	1	1	0	22.30	9.14	21.50					0	0	
		33	Kinutu	Dug Well		692935	9446993	0	0	0	24.20	9.03	26.50					0	0	
		33	Kinutu	Dug Well		693731	9447710	0	0	0	21.10	9.55	28.00					0	0	
		34	Msambu	Water hole		691619	9444019	1	0	0	20.00	8.53	6.35					0	0	
		34	Msambu	Dug Well		692004	9443785	1	0	0	22.50	8.89	12.73					9	0	
		35	Nkuninkana	Dug Well		695053	9443045	0	0	0	21.80	9.59	6.27					0	0	
		35	Nkuninkana	Water hole	Unprote	696661	9443744	1	0	0	21.60	8.50	14.78					0	0	
		35	Nkuninkana	Dug Well		695743	9444082	0	0	0	23.30	8.57	28.30					0	0	
		36	Wibia	Water hole		699315	9446848	1	2	2	24.00	8.43	17.87					0	0	
		36	Wibia	House hold		700711	9446850	0	0	0	18.80	9.26	36.80					0	0	
		36	Wibia	Dug Well		700346	9448265	0	0	0	24.00	8.92	38.00					0	0	
Sepuka		37	Msimi	Water hole		670455	9474411	1	2	2	23.40	8.41	13.00					0	0	
		37	Msimi	Dug Well		669048	9474137	1	0	0	23.50	8.55	14.49					0	0	
		38	Msungu	Dug Well		673234	9477387	1	1	1	19.90	8.58	13.58					0	0	
		38	Msungu	Water hole		672775	9478204	1	1	1	17.10	8.32	20.00					0	0	
		39	Kintandaa	Water hole		675420	9470075	1	1	1	21.10	5.55	12.79					0	0	
		39	Kintandaa	Dug Well		675679	9466755	0	0	0	24.20	8.31	19.25					0	0	
		39	Kintandaa	House hold		675353	9468675	0	0	0	20.90	9.04	29.40					2	0	
		40	Mnang'ana	Dug Well		674728	9474079	1	1	0	21.60	8.77	20.70					0	0	
		40	Mnang'ana	Water hole		676364	9472573	1	1	1	19.80	8.80	21.00					0	0	
		41	Mtunduru	Water hole		667001	9466565	1	0	0	25.60	9.16	14.12					0	0	
		41	Mtunduru	Dug Well		667762	9467518	0	0	0	26.10	8.19	19.21					0	0	
		42	Mwaru	Water hole		642214	9472204	1	1	1	24.60	8.91	6.81					0	0	
Mwaru		42	Mwaru	Borehole		641760	9471858	0	0	0	26.20	9.99	163.40					0	0	
		43	Miandala	Water hole		626787	9477246	1	1	1	23.40	10.56	18.97					1	0	
		44	Igombwe	House hold		648335	9452305				20.10	8.75	76.80					200	0	Model VI
		44	Igombwe	Water hole		628661	9452594	0	1	0	21.30	8.72	79.50					10	0	Model VI
		45	Msoa	Water hole		614365	9447520	0	1	0	22.90	10.01	75.30					4	0	Model VII
		46	Mgungira	Water hole	1	611924	9446693				30.10	9.51	7.44							
Mgungira		46	Mgungira	Water hole	5	612153	9445041				28.00	9.30	17.50							
		46	Mgungira	Water hole	3	612153	9445041				26.02	7.48	31.10							
		46	Mgungira	Water hole	2	612153	9445041				29.00	7.88	33.03							
		46	Mgungira	Water hole	4	612153	9445041				27.00	9.03	52.80							
		47	Ufana	Water hole		611443	9458242	1	2	1	27.60	9.47	17.48							
		48	Iyumbu	Water hole		609950	9431128	1	1	0	25.10	9.83	39.30							

Division	Ward	No.	Village	Sample		Grid		Color	Muddiness	Smell	Temperature C	pH	EC (mS/m)	F ppm	NO3 ppm	NO2 ppm	NH4 ppm	Colon Bacillus		Remarks			
				Point	Source	X	Y											Paper	Water Sp.				
Irisya	Irisya	49	Masutianga	Borehole		676476	9483152	0	0	0	25.10	9.72	25.70						0				
		Borehole		MD	677310	9484395	0	0	0	0	26.80	9.55	328.00										
		Water hole			679331	9482111	1	3	1	18.80	9.56	36.00											
		Dug Well			679565	9482304	1	1	0	23.90	9.59	45.50								0			
		Charco Dam			679714	9481564	1	1	1	18.10	10.64	66.70											
Ntinko	Ntinko	51	Masutianga	Dug Well		704678	9496243	0	0	0	23.80	7.61	2.40	5.0	0.1	0			23				
		Water hole			704960	9497423	1	2	1	20.20	7.12	24.60	2.0	1	0	0.5	14						
		Borehole			704323	9497356	0	0	0	26.50	7.51	125.60	5.0	45	0	0.5	0						
		Dug Well			704451	9499392	0	0	0	24.20	7.34	205.00	5.0	5	0	0.5	5						
		House hold			704176	9499036	0	0	0	21.20	8.00	269.00	0.0	2	0.1	0.5	0						
		Dug Well			704414	9499234	0	0	0	23.40	7.33	270.00	5.0	2	0.1	0.5	45						
		Water hole			706761	9497868	1	2	0	27.10	9.52	30.40								45			
		Water hole			706007	9497946	1	2	0	23.90	9.09	59.20	1.0										
		House hold			706707	9497833	1	2	0	23.10	9.75	72.90	1.0	45	0.1	0.5	30						
		Water hole			703334	9500765	1	1	2	23.50	10.55	172.80											
		Dug Well			701631	9502590	0	0	0	24.60	10.77	125.70									0		
		House hold			703577	9502856	0	0	0	23.20	10.66	142.20											
		Makuro		Makuro	55	Mughang	Dug Well		706425	9493719	0	0	0	25.20	9.20	34.70	5.0	2	0	0		3	
House hold			706439		9493799		0	0	0	21.40	9.95	34.70	5.0						14				
Dug Well			707296		9492600		1	0	0	19.80	9.03	46.50	1.0	45	0.1	0	48						
House hold			707194		9492498		1	0	0	20.20	9.36	47.00	1.0						26				
Water hole			705385		9493968		1	1	1	25.30	9.94	44.40	2.0	5	0	2	157						
House hold			705223		9493959		0	0	0	20.80	9.98	50.70	2.0							80			
Dug Well			700087		9496061		0	0	0	23.90	10.26	242.00	5.0	10	0.1	0.5	72						
House hold			700202		9496138		0	0	0	21.80	10.76	243.00	5.0	10	0.1	0.1	70						
House hold			697812		9494123		1	2	2	19.60	6.95	24.70	0.5	1	0					61			
Water hole			697520		9494005		1	2	2	19.30	6.81	26.20	0.5	1	0	1	79						
Water hole			713790		9499887		1	1	1	21.10	9.71	66.20	2.0	5	0.1	0.5	7						
House hold			713776		9500174		1	1	1	19.20	9.65	75.10	5.0	20						26			
Water hole			718021		9503772		0	0	0	19.10	10.12	88.40	2.0	2	0	0.5	6						
House hold		717857	9504427	0	0	0	18.20	10.22	91.00	1.0	20	1	0.5	5									
Makuro	Makuro	61	Mughang	Water hole		707241	9506508	0	0	0	20.50	10.50	215.00	5.0					6				
		House hold			707360	9506301	0	0	0	26.10	11.18	86.80	51.0						34				
		House hold			706836	9505334	0	0	0	22.60	10.88	254	5.0										
		Dug Well			706725	9505488	0	0	0	23.10	10.17	257.00	5.0										
		Water hole			707884	9497581	1	1	1	20.60	9.23	11.05	2.0							0			
		House hold			708585	9497853	1	0	0	22.30	9.85	15.31	2.0							25			
		House hold			711377	9499882	0	0	0	21.00	10.52	115.10	5.0	5	0	0.5	0						
Makuro	Makuro	62	Mughang	Dug Well		711382	9500048	0	0	0	24.10	9.97	118.50	5.0	2	0	0.5	5					
		Dug Well			712516	9497236	0	0	0	23.80	8.92	12.87	0.5	20	0	0.5	12						

Division	Ward	No.	Village Name	Sample		Grids		Color	Muddiness	Smell	Temperature C	pH	EC (mS/m)	F ppm	NO3 ppm	NO2 ppm	NH4 ppm	Colon Bacillus		Remarks	
				Point	Source	X	Y											Paper	Water Sp.		
Ilongero	Ughandi	63	Matumbo	House hold		712342	9497288	0	0	0	21.10	9.46	14.21	0.5	20	0	0.5	8			
		63	Matumbo	Dug well		710483	9497413	1	0	0	21.30	10.08	24.00	2.0	0	0	0	2			
		63	Matumbo	Water hole		710502	9497413	1	0	0	21.40	10.20	45.90	2.0	0	0	0	1			
		63	Matumbo	House hold		710186	9497477	0	0	0	19.60	10.82	92.40	2.0				0			
		64	Mkenge	House hold		709749	9493265	0	0	0	18.60	10.86	95.30	5.0	0.1				55		
		64	Mkenge	Water hole		709549	9493455	1	1	0	17.40	10.57	105.80	5.0	0.5	0.5			68		
		65	Migugu	Dug Well		712960	9500637	0	0	0	25.60	10.30	26.20	5.0	1.0	0.1	0		3		
		65	Migugu	House hold		712862	9500872	0	0	0	23.40	10.43	26.40	5.0	0.1			5			
		66	Ughandi 'B'	Water hole		690945	9492510	1	1	1	24.70	10.27	168.10	5.0	45	0.2	0.5		60		
		66	Ughandi 'B'	House hold		690895	9492524	1	1	1	22.00	10.40	173.80	5.0	45				0		
		66	Ughandi 'B'	Borehole		690260	9492481	0	0	0	25.80	9.92	195.70	2.0	10	0	0		0		
		66	Ughandi 'B'	House hold		690212	9492457	0	0	0	21.90	10.29	210.00	5.0	45	1	1		0		
		67	Nkwae	House hold		683754	9489743	1	1	1	22.90	6.20	17.57	2.0	2	0	0.5		200		
		67	Nkwae	Water hole		684282	9490020	0	0	0	21.00	7.66	132.10	5.0	2	0.5	0.5		28		
		68	Laghanida	Water hole		692339	9497214	2	1	2	21.00	7.64	84.90	2.0	10	0.2	0.5		2		
		68	Laghanida	House hold		692581	9495716	0	0	0	20.80	7.55	121.40	5.0	45	0			0		
		68	Laghanida	Borehole		692553	9495602	0	0	0	25.60	7.06	123.10	5.0	45	0	0.5		0		
		69	Misinko	Water hole		695077	9487013	0	0	0	21.40	7.89	64.80	5.0					0		
		69	Misinko	Borehole		694571	9487410	0	0	0	26.00	6.97	232.00	5.0	45	0			1		
		69	Misinko	House hold		694487	9487403	0	0	0	20.80	7.43	232.00	5.0					3		
		70	Ntondo	Water hole		680882	9491946	1	2	2	18.70	6.35	13.67	0.0	2	0.1			57		
		70	Ntondo	Borehole		681114	9492020	0	0	0	26.40	6.75	158.00	5.0	45	0	0.5		0		
		70	Ntondo	House hold		681279	9492161	0	0	0	20.00	7.68	159.10	5.0	45	1			33		
		71	Msisisi	Water hole		684818	9485318	1	1	1	28.20	8.00	96.90	5.0	5	0.1	0.5		60		
		72	Senene Mfuru	Borehole		686816	9494832	0	0	0	26.40	6.81	183.50	5.0	45	0	0.5		40		
		72	Senene Mfuru	Water hole		687029	9494362	0	0	0	22.60	7.11	214.00	5.0	45	0.5	0.5		44		
		73	Madamigha	Water hole		705753	9482562	1	0	0	23.70	7.43	9.74	2.0					26		
73	Madamigha	Dug Well		706092	9483142	0	0	0	25.20	8.51	137.70	5.0					0				
73	Madamigha	House hold		706339	9483166	0	0	0	20.40	8.78	140.00	5.0					200				
74	Mrama	Water hole		709687	9482163	0	0	0	25.80	7.42	20.50	1.0					2				
74	Mrama	House hold		710444	9481124	0	0	0	23.50	8.13	99.50	5.0					1				
74	Mrama	Dug Well		710573	9481218	0	0	0	24.40	7.98	101.30	5.0					0				
75	Mwahango	House hold		706144	9478720	1	2	2	20.70	7.51	20.00	2.0					12				
75	Mwahango	Water hole		706388	9478603	1	2	2	24.30	7.65	20.80	2.0					38				
76	Ilongero	Borehole	28/59	707317	9482541													8	Model VI		
76	Ilongero	House hold	1 Rain water															0			
76	Ilongero	Water hole		707815	9485019													200			
76	Ilongero	House hold	2																		
77	Mwakiti	Water hole		709037	9485336	1	1	1	0	0	19.92	2.0						23			
77	Mwakiti	House hold		709892	9485600	1	1	1	0	0	21.10	7.78	26.50	2.0				48			

Division	Ward	No.	Village	Sample		Grid		Color	Muddiness	Smell	Temperature	pH	EC (mS/m)	F ppm	NO3 ppm	NO2 ppm	NH4 ppm	Colon Bacillus		Remarks
				Point	Source	X	Y											Paper	Water Sp.	
		78	Itamuka	Water hole		707520	9480139		0	0	20.40	8.03	32.80	5.0				0	0	
		78	Itamuka	House hold		707577	9479530	0	0	0	22.00	8.19	37.60	1.0				50	0	
		78	Itamuka	Dug Well		707028	9479508	0	0	0	23.10	8.04	40.80	1.0				9	0	
		79	Sekouture	House hold		709375	9486859	0	0	0	22.80	8.61	101.60	5.0				0	0	
		79	Sekouture	Dug Well		709564	9486791	0	0	0	24.50	8.68	102.10	5.0				0	0	
		79	Sekouture	House hold		707512	9487290	0	0	0	21.30	8.51	170.00	5.0				0	0	
	Kinyeto	80	Kinyeto	Water hole		703104	9475020	1	2	1	17.70	6.55	8.45	1.0				12	0	
		80	Kinyeto	Dug Well		703352	9474107	0	0	0	22.60	7.12	31.60	1.0				10	0	
		80	Kinyeto	House hold		703579	9474075	0	0	0	19.20	7.52	40.60	5.0				0	0	
		81	Ntundu	Dug Well		706981	9470920	0	1	2	24.20	5.95	16.70	0.5				5	0	
		81	Ntundu	House hold		706964	9470815	0	1	2	21.00	6.98	17.92	0.5				1	0	
		81	Ntundu	Water hole		706789	9469829	0	0	0	22.20	6.30	28.40	0.5				1	0	
		82	Mkimbi	Water hole		702233	9474092	1	1	1	19.70	6.78	19.37	2.0				3	0	
		82	Mkimbi	Dug Well		701674	9475589	0	0	0	24.00	8.00	42.10	5.0				8	0	
		82	Mkimbi	House hold		701814	9475444	0	0	0	22.30	8.15	42.60	5.0				24	0	
		83	Minyaa	Dug Well		707452	9472538	1	1	2	24.50	6.71	14.48	1.0				0	0	
		83	Minyaa	House hold		707929	9472491	1	1	2	20.60	7.13	15.59	1.0				15	0	
		83	Minyaa	Water hole		710207	9471992	1	1	1	23.60	6.71	40.80	1.0				39	0	
		84	Igauri	Water hole		698270	9481935	0	0	0	21.60	7.57	35.30	1.0				30	0	
		84	Igauri	Dug Well		699105	9480496	0	0	0	22.40	7.81	36.70	2.0				13	0	
		84	Igauri	House hold		698958	9480398	0	0	0	18.70	8.20	37.70	2.0				8	0	
		85	Ntonge	Dug Well		699942	9480121	1	0	0	22.70	8.02	23.80	2.0				30	0	
		85	Ntonge	House hold		700570	9480160	1	0	0	23.10	7.93	24.10	2.0				50	0	
		85	Ntonge	Water hole		701798	9481175	0	0	0	24.80	9.08	130.50	5.0				36	0	
		86	Mghamo	Water hole		714035	9469314		1	2	23.80	6.29	10.59	1.0				5	0	
		86	Mghamo	House hold		711144	9465919	0	0	0	21.50	5.48	25.40	0.5				3	0	
		86	Mghamo	Dug Well		711295	9466108	0	0	0	22.70	5.31	25.70	0.5				0	0	
		87	Merya	Charco Dam		717552	9478819	2	0	1	21.50	10.97	31.60	5.0				1	0	
		87	Merya	House hold		717858	9478517	2	1	0	18.70	10.46	39.70	5.0				3	0	
		87	Merya	Borehole		716445	9478263	0	0	0	23.10	9.01	94.90	2.0				0	0	
		87	Merya	Dug Well		718444	9478302	0	0	0	24.00	8.87	171.30	5.0				2	0	
		88	Mvae	Water hole		717829	9487770	2	3	1	22.90	7.69	8.94	2.0				17	0	
		88	Mvae	House hold		717190	9487758	0	0	0	21.50	9.24	98.30	5.0				52	0	
		89	Makhandi	Water hole		712682	9480796	1	1	0	28.90	10.10	174.20	5.0				19	0	
		89	Makhandi	House hold		712103	9481027	0	0	0	19.70	9.43	175.70	5.0				24	0	
		90	Kinyagigi	Water hole		713419	9477790	1	0	0	18.30	7.84	16.31	1.0				6	0	
		90	Kinyagigi	House hold		715597	9478256	1	0	0	19.30	8.22	19.16	2.0				39	0	
		90	Kinyagigi	Dug Well		713621	9477257	1	0	0	21.30	7.86	21.00	1.0				2	0	
		91	Mwanyonye	Water hole		710976	9476182	1	1	1	20.70	7.16	12.05	1.0				41	0	
		91	Mwanyonye	Dug Well		712959	9474929	1	1	0	22.80	8.01	32.60	2.0				0	0	

Division	Ward	No.	Village Name	Sample		Grid		Color	Muddiness	Smell	Temperature C	pH	EC (mS/m)	F ppm	NO3 ppm	NO2 ppm	NH4 ppm	Colon Bacillus Paper	Colon Bacillus Water Sp.	Remarks			
				Point	Source	X	Y																
Mgori	Ikhanoda	91	Mwanvonve	House hold		712779	9475159	1	0	0	23.30	8.36	32.60	2.0	0	0	0	0	1				
		92	Ikhanoda	House hold		717730	9493869	0	0	0	23.70	8.21	167.70	5.0	0	0	0	0	0	0			
		93	Mjughuda	Dug Well		721595	9496481	0	0	0	23.90	7.73	116.40	5.0	5	0	0	0.5	0	0			
		93	Mjughuda	House hold		721629	9496587	0	0	0	19.60	8.12	120.60	5.0	45	0.5	0.5	0.5	1	0			
		93	Mjughuda	Water hole		717385	9495291	0	1	0	22.00	7.90	164.80	5.0	20	0.2	0.5	0.5	16	0			
		94	Msimihi	House hold		716487	9488909	0	0	0	20.80	8.02	99.20	5.0	20	0	0	0.5	2	0			
		94	Msimihi	Dug Well		716695	9488933	0	0	0	22.50	7.90	100.10	5.0	10	0	0	0.5	0	0			
		94	Msimihi	Water hole		714281	9488930	1	1	0	20.70	8.36	107.90	5.0	20	0.1	0.5	0.5	15	0			
		95	Mditu	Water hole		723348	9493007	1	1	1	21.00	7.94	103.30	5.0	10	0.1	0.5	0.5	69	0			
		95	Mditu	House hold		723166	9493005	1	1	1	21.90	7.76	121.40	5.0	1	45	0.5	0.5	10	0			
		96	Mwasauya	Water hole		720286	9494128	0	0	0	22.90	7.88	96.60	5.0	45	0.2	0.5	0.5	26	0			
		96	Mwasauya	House hold		720523	9493871	0	0	0	23.60	7.92	98.00	5.0	45	0.1	0.5	0.5	18	0			
		97	Mgamu	Water hole		724039	9497744	0	0	0	22.30	7.59	165.10	5.0	20	0.2	0.5	0.5	55	0			
		97	Mgamu	House hold		723960	9497697	0	0	0	22.70	8.21	202.00	5.0	45	1	1	1	17	0			
		97	Mgamu	Charco Dam		722206	9500380	0	1	2	22.00	9.43	509.00	5.0	0	0	0	0	0	0			
		98	Mipilo	Water hole		723846	9481654	2	1	2	21.20	7.69	10.63	1.0	0	0	0	0	0	28	0		
		98	Mipilo	Borehole		723202	9480658	0	0	0	25.80	8.19	117.30	5.0	0	0	0	0	0	0	0		
		98	Mipilo	House hold		723731	9481087	0	0	0	21.90	8.46	124.40	5.0	0	0	0	0	0	27	0		
		99	Mangida	House hold		731078	9484121	1	1	1	19.80	8.70	31.00	5.0	0	0	0	0	0	26	0		
		99	Mangida	Borehole		732369	9483716	0	0	0	27.30	8.72	157.80	2.0	0	0	0	0	0	0	0		
		100	Sefunga	Water hole		734225	9487299	1	3	1	23.10	7.92	127.20	5.0	10	0.1	0.5	0.5	31	0			
		101	Ghata	Water hole		719602	9485005	1	3	1	21.90	7.38	12.52	2.0	0	0	0	0	0	15	0		
		101	Ghata	House hold		719645	9484905	1	3	1	26.40	7.60	12.70	2.0	0	0	0	0	0	5	0		
		102	Msange	Charco Dam		727009	9485959	2	3	2	18.70	9.36	41.70	5.0	0	0	0	0	0	51	0		
		102	Msange	House hold		726985	9485921	2	3	2	19.50	8.19	42.30	5.0	0	0	0	0	0	200	0		
		102	Msange	Borehole		725010	9486443	0	0	0	25.00	9.13	120.90	5.0	0	0	0	0	0	3	0		
		103	Mgori	House hold		719080	9463831	0	0	0	20.90	9.90	80.20	5.0	0	0	0	0	0	29	0		
		103	Mgori	Dug Well		719042	9464024	0	0	0	24.20	9.50	80.70	5.0	0	0	0	0	0	60	0		
		103	Mgori	Water hole		718756	9463806	0	0	0	21.50	9.45	84.10	5.0	0	0	0	0	0	50	0		
		104	Mkhola	Water hole		718166	9465107	1	1	1	24.10	8.14	27.60	1.0	0	0	0	0	0	24	0		
		104	Mkhola	House hold		718010	9465645	0	0	0	22.40	9.36	47.30	1.0	0	0	0	0	0	33	0		
		104	Mkhola	Dug Well		718030	9465492	0	0	0	26.40	9.06	86.10	2.0	0	0	0	0	0	0	0		
		105	Sughana	Water hole		715947	9461181	1	1	1	24.80	8.56	31.80	1.0	0	0	0	0	0	65	0		
		105	Sughana	House hold		715567	9460545	1	1	1	22.50	8.85	33.40	1.0	0	0	0	0	0	90	0		
		106	Unyampanda	Water hole		728721	9459102	1	1	1	25.20	7.77	9.67	1.0	0	0	0	0	0	13	0		
		106	Unyampanda	House hold		728860	9459637	1	1	1	22.10	8.15	10.88	1.0	0	0	0	0	0	88	0		
		107	Mughunga	Water hole		732154	9457719	1	1	1	23.70	7.80	11.60	1.0	0	0	0	0	0	35	0		
		107	Mughunga	House hold		731650	9457448	1	1	1	22.20	8.12	12.58	1.0	0	0	0	0	0	25	0		
		108	Nduamughanga	House hold		746110	9450104	1	1	1	22.30	8.01	7.91	5.0	0	0	0	0	0	8	0		
		109	Ngimu	House hold		730565	9473679	0	0	0	18.60	9.03	47.90	2.0	0	0	0	0	0	38	0		

Division	Ward	No.	Village Name	Sample		Grid		Color	Muddiness	Smell	Temperature C	pH	EC (mS/m)	F ppm	NO3 ppm	NO2 ppm	NH4 ppm	Colon Bacillus No.		Remarks		
				Point	Source	X	Y											Paper	Water Sp.			
Mungaa		109	Ngimu	Water hole		730654	9473270	0	0	0	22.50	8.27	48.10	2.0					28			
		110	Mwighanji	House hold		727610	9471810	1	3	1	21.40	8.55	24.10	1.0						200		
		110	Mwighanji	Dug Well		727654	9472077	1	3	1	21.30	9.95	183.70	5.0						68		
		111	Itaja	Charco Dam		733634	9482622	1	1	0	19.90	10.10	28.60	5.0						7		
		111	Itaja	House hold		732109	9479403	1	1	0	21.10	9.08	33.90	5.0						104		
		112	Pohama	Charco Dam		735928	9473661	1	3	1	24.20	8.98	9.06	2.0						45		
		112	Pohama	House hold		735200	9474045	1	3	1	23.00	8.88	9.24	2.0						36		
		113	Mungaa	Water hole		709377	9447268	1	1	0	22.90	7.72	7.82	1.0						16		
		113	Mungaa	House hold		708425	9450093	1	1	0	23.90	8.89	16.85	1.0						3		
		114	Minyinga	Water hole		702345	9451904	1	1	1	22.20	7.49	13.53	1.0						200		
		114	Minyinga	House hold		702481	9451123	0	0	0	21.40	8.80	45.90	1.0						33		
		114	Minyinga	Dug Well		702429	9451131	0	0	0	23.10	8.51	46.50	1.0						30		
		115	Kinku	Water hole		710418	9451396	1	1	1	17.40	8.43	4.19	1.0						1		
		115	Kinku	House hold		710260	9451724	0	0	0	20.30	8.47	8.65	0.5						70		
		115	Kinku	Dug Well		710315	9452161	0	0	0	21.50	9.54	21.90	1.0						31		
		116	Kimbwi	Dug Well		704578	9446508	0	0	0	23.40	9.14	36.80	1.0						0		
116	Kimbwi	House hold		704504	9446536	0	0	0	23.20	9.09	38.40	1.0						1				
116	Kimbwi	Charco Dam		705524	9443626	2	1	1	23.00	11.42	79.40	5.0						7				
117	Unyamighumbi	Borehole		706268	9450683	0	0	0	24.50	9.51	36.30	1.0						0				
117	Unyamighumbi	House hold		706346	9450700	0	0	0	23.80	9.51	36.30	1.0						0				
118	Misughaa	House hold		724521	9441178	1	1	1	22.50	8.96	10.92	1.0						200				
118	Misughaa	Water hole		724299	9440595	1	1	1	27.90	8.96	21.00	1.0						200				
119	Msule	House hold		726822	9434573	1	1	1	21.20	9.58	69.70	5.0						200				
119	Msule	Water hole		727004	9434601	1	1	1	25.90	9.47	69.70	2.0						200				
120	Sakaa	House hold		723481	9442152	1	1	1	22.10	8.61	26.70	1.0						200				
120	Sakaa	Water hole		723375	9442095	1	1	1	24.50	8.51	27.50	1.0						27				
121	Mnane	Water hole		721915	9446602	1	1	1	24.50	8.48	13.70	1.0						11				
121	Mnane	House hold		722964	9447086	1	1	1	25.10	9.32	27.20	5.0						200				
121	Mnane	Dug Well		722980	9445792	0	0	0	26.70	9.42	425.00	75.0						0				
121	Mnane	Dug Well		722911	9446977	0	0	0	27.70	9.23	1208.00	75.0						1				
122	Nkundi	Water hole		722774	9445060	1	1	1	24.20	8.59	31.20	1.0						200				
122	Nkundi	House hold		722843	9444955	1	1	1	22.20	8.82	35.20	1.0						200				
123	Suyu	Water hole		707191	9457701	1	1	1	23.00	7.52	16.54	0.5						15				
123	Suyu	House hold		707743	9458191	1	1	1	21.40	7.85	16.64	1.0						34				
124	Unyankanya	Dug Well		709848	9459652	1	1	1	24.60	7.64	11.45	1.0						0				
124	Unyankanya	House hold		709889	9459468	1	1	1	23.60	7.90	11.89	0.5						2				
124	Unyankanya	Water hole		708973	9459870	1	1	1	23.80	8.03	15.56	1.0						200				
125	Mkunguakithendo	Water hole		720990	9449608	1	1	1	25.00	8.60	13.01	2.0						200				
125	Mkunguakithendo	House hold		721139	9449018	1	1	1	20.80	8.93	15.25	2.0						200				
126	Ntuntu	House hold		719722	9433094	1	1	0	20.50	9.37	14.15	0.5						200				

Division	Ward	No.	Village Name	Sample		Grnde		Color	Muddiness	Smell	Temperature C	pH	EC (mS/m)	F ppm	NO3 ppm	NO2 ppm	NH4 ppm	Colon Bacillus Paper	Colon Bacillus No. Water Sp.	Remarks
				Point	Source	X	Y													
		126	Nnuntu	Water hole		719496	9432531	2	1	0	22.70	9.25	30.00	0.5				49		
		126	Nnuntu	Borehole		718319	9431015	0	0	0	23.50	9.14	93.40	2.0				0		
		127	Ntewa	Dug Well		718383	9430724	1	0	0	23.40	8.19	7.83	0.5				0		
		127	Ntewa	House hold		718322	9430702	1	0	0	22.60	8.24	8.02	1.0				0		
		127	Ntewa	Water hole		718460	9431030	1	1	0	23.30	8.75	21.40	1.0				0		
		128	Mampando	House hold		717975	9435582	1	1	0	19.20	8.71	28.80	1.0				200		
		128	Mampando	Borehole		717636	9436006	0	0	0	25.90	8.77	221.00	5.0				0		
		129	Lighwa	Water hole		710914	9439417	1	1	0	22.00	7.86	9.58	1.0				12		
		129	Lighwa	House hold		710642	9439380	1	1	0	23.60	8.43	21.00	1.0				9		
		129	Lighwa	Dug Well		710731	9439550	1	1	0	25.30	8.39	21.50	0.5				1		
		130	Mwisi	Dug Well		709986	9441771	0	0	0	24.30	8.17	32.40	1.0				0		
		130	Mwisi	House hold		710043	9441973	0	0	0	23.00	8.36	33.00	0.5				0		
		130	Mwisi	Water hole		709954	9442093	1	3	1	23.50	8.43	42.20	2.0				29		
Total																				

Table-1.6.6-4 (3) Water Quality of Target Villages in Manyoni District, Singida Region

Division	Ward	No.	Village	Sample		Gride		Color	Muddiness	Smell	Temperature C	pH	EC (mS/m)	F ppm	NO3 ppm	NO2 ppm	NH4 ppm	Colon Bacillus		Remarks			
				Point	Source	X	Y											Paper	Water Sp.				
Manyoni	Manyoni	1	Manyoni	Borehole	1	678611	9383393	0	0	0	20.40	7.06	62.00	0.5	0.02	0			35				
		1	Manyoni	Borehole	2	702495	9365657	0	0	0	18.80	6.82	195.20	0.5						58			
		1	Manyoni	Borehole	3	702473	9365671	0	0	0	25.40	7.13	81.60	0.5						22			
		1	Manyoni	House hold		708549	9359839	0	0	0	22.21	7.70	83.90	0.5						14			
		2	Kipondoda	Dug Well		703930	9363735	1	0	0	25.50	7.41	14.38	1	2	0.02	0.5				13		
		2	Kipondoda	Borehole		703705	9362795	0	0	0	26.40	7.00	387.00	5	20	0.02	0.5				0		
		2	Kipondoda	House hold		703739	9362704	0	0	0	24.30	7.90	0.40	5	20	0.1	0.5				0		
		3	Mwanzi	Water hole		704306	9365195	1	0	0	24.20	6.23	63.50	1							25		
		3	Mwanzi	House hold		704293	9365201	1	0	0	23.10	6.23	65.50	1							16		
		4	Muhalala																				
		5	Mdunundu	Water hole		702418	9370513	1	2	0	19.90	6.25	7.80	0.5	0	0	0				2		
		5	Mdunundu	House hold		713415	9362341	1	2	0	19.50	6.67	12.41	2	10	0.2	0				0		
		6	Mitoo	Borehole		702341	9370418	0	0	0	27.10	7.06	88.20	1	20	0.05	0.4				7		
		6	Mitoo	House hold		702363	9370367	0	0	0	20.50	7.38	96.20	1	20	0.05	0.4				0		
7	Mkwese	Water hole		700071	9378547	0	0	0	22.70	6.00	41.60	0.5							26				
7	Mkwese	Dug Well		708584	9359821	0	0	0	24.10	7.95	52.50	0.5	20	0.05	0.4				57				
7	Mkwese	Borehole		700025	9378513	0	0	0	24.70	6.95	50.80	1							3				
7	Mkwese	House hold		699004	9377733	0	0	0	22.30	7.82	43.20	0.5	45	0.1	0				2				
7	Mkwese	House hold		699775	9378331	0	0	0	22.90	6.56	41.30	1							14				
8	Kinangali																						
8	Kinangali																						
Aghondi	Aghondi	9	Aghondi	Water hole		688177	9363080	0	0	0	26.70	5.78	0.35	1	10	0.05	1	0.05	1	28			
		9	Aghondi	Borehole		687936	9363219	0	0	0	25.50	5.23	66.10	0.5	20	0.05	0			8			
		9	Aghondi	House hold		688203	9363350	0	0	0	22.40	4.86	65.50	0.5	20	0.1	0.4			26			
		10	Mabondeni	Water hole		688141	9363329	0	0	0	22.10	5.02	11.92	1	0	0	0			17			
		10	Mabondeni	House hold		688141	9363291	0	0	0	22.50	4.65	12.24	1	0	0	0			10			
		11	Njiri	Water hole		687971	9372532	0	0	0	21.70	6.40	56.20	1	20	0	0	0	0.03	0	25		
		11	Njiri	House hold		697971	9362594	0	0	0	22.40	6.67	56.90	1	10	0.03	0			0	0		
		12	Kamenyanga	Water hole		693522	9369767	0	0	0	24.30	8.44	49.70	0.50						0.00	22		
		12	Kamenyanga	Dug Well		693523	9369765	0	0	0	23.60	5.94	20.90	0.50	0.00	0.00	0.40			3			
		12	Kamenyanga	House hold		688010	9369871	0	0	0	24.40	6.60	22.60	0.50	2.30	0.01	0.40			3			
Idodyandole	Idodyandole	12	Kamenyanga	House hold		693971	9369006	0	0	0	21.30	9.92	52.20	0.50						0			
		13	Idodyandole	Water hole		694948	9343011	0	0	0	23.30	5.00	14.75	0.5						5			
		13	Idodyandole	Borehole		695480	9343627	0	0	0	25.20	6.87	327.00	1						0			
		13	Idodyandole	House hold		695975	9343641	0	0	0	21.20	6.13	0.32	1						3			
		13	Idodyandole	House hold		695875	9343364	0	0	0	22.50	6.13	22.80	0.5						0			
		14	Mbugani	Borehole		689291	9354365	0	0	0	28.10	5.55	206.00	0.5						0			

Division	Ward	No.	Village	Sample		Gride		Color	Muddiness	Smell	Temperature	pH	EC (mS/m)	F ppm	NO3 ppm	NO2 ppm	NH4 ppm	Colon Bacillus		Remarks			
				Point	Source	X	Y											Paper	Water Sp.				
Itigi	Itigi	14	Mbugani	House hold		689270	9354331	0	0	0	23.80	5.61	0.21	0.5					0				
		15	Kashangu	Borehole		703779	9346040	0	0	0	24.30	5.70	165.20	1					7				
		16	Itigi	Dug Well	1	664678	9369193				20.70	7.84	180.00								12	Model Vi	
		16	Itigi	Dug Well	2	664678	9369193				22.70	7.20	22.80								0		
		16	Itigi	Charco Dam	1						19.50	7.78	9.70								6		
		16	Itigi	Charco Dam	2						19.50	7.19	21.40									3	
		16	Itigi	Dug Well	1	665301	9369241				24.80	6.65	175.80								3		
		16	Itigi	Borehole	3773	669426	9369026				27.40	6.14	203.00								3		
		16	Itigi	Water hole		667834	9368960				23.60	5.07	5.57								11		
		16	Itigi	House hold	1																4		
		16	Itigi	House hold	2															13			
		17	Doroto	Borehole	4373A	651602	9364165				26.30	7.21	224.00								0		
		17	Doroto	Borehole	0.196	652710	9363373				27.20	6.70	146.60								52	Pilot Villa	
		17	Doroto	House hold	1	Dug well															0		
		17	Doroto	House hold	2	Rain Water															0		
		17	Doroto	House hold																	5		
		18	Kitaraka	Water hole			651008	9375816			0	0	22.40	7.05	0.21	1	20	0.1	0.4	0			
18	Kitaraka	House hold			651517	9375823			0	0	22.40	7.09	0.20	1	20	0.1	0	0					
18	Kitaraka	House hold			651455	9375557			0	0	20.40	5.56	6.92	0.5					0				
19	Sanjaranda	Water hole			669105	9375282			0	0	24.00	7.00	196.40	2					26				
19	Sanjaranda	Borehole			668138	9374973			0	0	26.30	7.53	91.10	0.5	0	0	1	0	0				
19	Sanjaranda	Borehole			668859	9374901			0	0	25.40	6.37	291.00	0.5					11				
19	Sanjaranda	House hold			669092	9375280			0	0	25.40	6.37	0.32	0.5					7				
19	Sanjaranda	House hold			666827	9380011			0	0	22.90	7.38	0.29	1					20				
20	Gurungu	Dug Well			665918	9379996			0	0	27.80	6.78	105.20	0.5	45	1	0.4	31					
20	Gurungu	Water hole			677141	9383991			1	0	25.60	6.52	36.00	1					60				
20	Gurungu	House hold			677258	9384053			0	0	25.70	6.70	160.70	1	45	1	0.4	7					
20	Gurungu	House hold			678644	9383404			0	0	21.00	6.48	35.00	1					4				
21	Kitopeni	Borehole	94		674879	9366305					25.00	6.50	81.70						0				
21	Kitopeni	Borehole	1573		674932	9367692					27.00	6.59	130.80						0				
21	Kitopeni	Dug well			675163	9366964					23.50	7.23	218.00						45				
21	Kitopeni	Charco Dam			673507	9368700					26.70	8.10	20.20						0				
21	Kitopeni	House hold	BH																36				
22	Ipande	Water hole			674606	9358295			1	0	21.40	6.27	17.11	2					18				
22	Ipande	Borehole			673703	9358974			0	0	22.40	5.45	139.30	2	20	0	0	0	10				
22	Ipande	House hold			674569	9358509			0	0	20.30	5.11	141.50	2	20	0	0	0	5				
22	Ipande	House hold			674675	9358491			1	0	19.50	5.92	11.71	2					13				
23	Muhanga	Borehole			675310	9350445			0	0	0.00	5.76	678.00	2	45	0.02	0	0	0				
23	Muhanga	Borehole			676664	9350908			0	0	25.20	5.42	203.00	2					0				

Division	Ward	No.	Village	Sample		Grid		Color	Muddiness	Smell	Temperature C	pH	EC (mS/m)	F ppm	NO3 ppm	NO2 ppm	NH4 ppm	Colon Bacillus		Remarks				
				Point	Source	X	Y											Paper	Water Sp.					
Kinshasa	Muhanga	23	Muhanga	House hold		675645	9350360	0	0	0	21.00	5.41	0.45	2	10	0	0	0	0					
		23	Muhanga	House hold		678081	9351592	0	0	0	21.40	5.17	0.21	2										
	Mgandu	Damwelu	24	Damwelu	Borehole		678081	9351592	0	0	0	26.80	5.13	92.90	0.5	45	0.1	0.4	1	0				
			24	Damwelu	House hold		674979	9362055	0	0	0	23.50	4.78	93.10	0.5	20	0.1	0.4	0	0				
		Mgandu	Mgandu	25	Mgandu	Water hole		617816	9333604	0	0	0	22.60	5.56	34.40	1				15				
				25	Mgandu	Borehole		617034	9335167	0	0	0	24.70	5.10	142.30	1				0	0			
			Mgandu	Mgandu	25	Mgandu	House hold		617997	9335184	0	0	0	22.40	5.07	142.90	0.5				0	0		
					25	Mgandu	House hold		617703	9334220	0	0	0	20.50	5.30	35.30	1				5			
		Rungwa	Kalangali	26	Kalangali	Water hole		606251	9327241	1	0	0	22.20	4.38	11.37	0.5	20	0	0.4	10				
				26	Kalangali	House hold		606222	9327770	1	0	0	21.60	4.20	13.30	0.5	10	0	0.4	5				
	Itagata		Itagata	27	Itagata	Water hole		632366	9346769	0	0	0	21.20	4.41	11.85	1				2				
				27	Itagata	Dug Well		632893	9346973	0	0	0	22.30	5.31	41.60	0.5	10	0	0	0	2			
	Itagata		Itagata	27	Itagata	House hold		632080	9346945	0	0	0	19.40	5.02	42.40	0.5	101	0	0	0	4			
				27	Itagata	House hold		632228	9346325	0	0	0	20.50	4.03	13.19	0.5				7				
	Makale		Kayui	Kayui	28	Kayui	Borehole		621950	9339453	0	0	0	25.40	4.81	44.80	1				3			
					28	Kayui	Borehole		624885	9341845	0	0	0	25.00	5.20	66.50	0.5	20	0	0	0	0		
			Kayui	Kayui	28	Kayui	House hold		624107	9340493	0	0	0	21.00	5.15	65.60	1	20	0	0	0	0		
					28	Kayui	House hold		622234	9339490	0	0	0	20.90	4.58	45.70	1				1			
		Makale	Makale	29	Makale	Dug Well		617343	9338993	0	0	0	23.50	5.12	18.93	0.5				0	0			
				29	Makale	House hold		617240	9339474	0	0	0	21.10	4.37	19.19	0.5				5				
		Rungwa	Rungwa	Rungwa	30	Rungwa	Charco Dam		557642	9230876	1	2	1	25.70	4.88	8.09	1				2			
					30	Rungwa	House hold		557593	9232599	1	2	1	23.20	4.83	10.23	1				0	0		
	Mwamagembe		Mwamagembe	31	Mwamagembe	Water hole		585028	9285690	0	0	0	24.60	4.41	8.63	1				1				
				31	Mwamagembe	House hold		585793	9284930	0	0	0	23.50	4.50	16.03	1				2				
	Kianula		Kianula	32	Kianula	Water hole		574836	9261358	2	0	0	19.80	5.98	7.51	1				5				
				32	Kianula	House hold		575241	9261569	2	0	0	19.90	5.52	9.92	1				9				
	Maweni	Maweni	Maweni	33	Maweni	Water hole		737224	9349062	0	0	0	27.90	7.70	10.80	1				16				
				33	Maweni	House hold		735310	9349554	0	0	0	26.80	6.90	11.80	1				11				
		Mvumi	Mvumi	34	Mvumi	Dug Well		736650	9346009	0	0	0	25.00	6.90	22.80	1				0				
				34	Mvumi	House hold		736537	9345696	0	0	0	26.00	6.60	20.80	1				0				
	Chikuyu	Ngaiti	Ngaiti	35	Ngaiti																			
				35	Ngaiti																			
		Chikuyu	Chikuyu	36	Chikuyu	Dug Well		729484	9350304	0	0	0	27.10	7.50	135.50	1				1				
				36	Chikuyu	Borehole		729226	9351515	0	0	0	29.20	6.70	376.00	1				0				
		Chikuyu	Chikuyu	36	Chikuyu	House hold		729544	9350590	0	0	0	25.90	7.00	128.70	1				6				
				36	Chikuyu	Borehole		726223	9358165	0	0	0	27.70	7.80	107.00	1				1				
		Mbwaswa	Mbwaswa	37	Mbwaswa	House hold		726428	9358309	0	0	0	24.40	7.60	0.10	1				6				
				37	Mbwaswa	Water hole		728600	9355652	1	0	0	23.80	6.90	38.20	0.5				20				
Mwiboo		Mwiboo	38	Mwiboo	Dug Well		728622	9353733	0	0	0	29.00	6.80	52.20	1				1					
			38	Mwiboo																7				

Division	Ward	No.	Village	Sample		Grids		Color	Muddiness	Smell	Temperature	pH	EC (mS/m)	F ppm	NO3 ppm	NO2 ppm	NH4 ppm	Colon Bacillus		Remarks		
				Point	Source	X	Y											Paper	Water Sp.			
Nkonko	Makanda	38	Mwiboo	House hold		728303	9353662	1	0	0	24.80	6.50	32.70	0.5					13			
		39	Makutopora	Water hole		734004	9360784	1	2	0	27.20	7.80	6.43	0.5					4			
		39	Makutopora	House hold		733965	9360709	1	2	0	26.40	7.20	7.05	0.5					0			
		40	Makanda	Water hole		759692	9371458	0	0	0	25.20	6.80	39.00	1					5			
		40	Makanda	House hold		757714	9370773	0	0	0	23.20	7.30	43.30	1					8			
		41	Mangasai	Water hole		750097	9375308	1	0	0	19.70	6.80	20.70	1					1			
		41	Mangasai	House hold		750178	9375596	1	0	0	21.00	7.40	38.50	1					0			
		42	Kitalalo	Water hole		741893	9354645	0	0	0	25.50	7.30	24.20	0.5					0			
		42	Kitalalo	House hold		742437	9354577	0	0	0	24.10	6.90	24.40	1					40			
		43	Kintinku	Dug Well		747605	9349158	0	0	0	27.40	6.80	21.00	1					8			
		43	Kintinku	House hold		745476	9348908	0	0	0	26.00	7.40	18.63	1					13			
		44	Lusille	Dug Well		746234	9346809	0	0	0	28.20	6.50	15.87	0					10			
		44	Lusille	House hold		746601	9346887	0	0	0	25.60	6.20	13.35	1					40			
		45	Udimaa	Dug Well		748308	9353283	0	0	0	27.30	8.57	16.89	0.5					5			
		45	Udimaa	House hold		748219	9353027	0	0	0	26.30	8.58	16.70	0.5					60			
		46	Nkonko	Borehole		717745	9297020	0	0	0	28.00	5.48	181.90	1					0			
		46	Nkonko	House hold		717567	9297718	0	0	0	24.80	5.57	0.21	1					3			
		47	Mpola	Water hole		715161	9309677	1	0	0	24.40	5.35	21.80	0.5					0			
		47	Mpola	Borehole		712534	9311502	0	0	0	24.40	6.20	104.80	1.00					0			
		47	Mpola	House hold		715172	9309698	1	0	0	21.80	4.95	19.47	0.5					0			
		48	Ntumbi	Water hole		729171	9305635	1	0	0	24.00	5.44	180.30	2					8			
		48	Ntumbi	House hold		729006	9366620	0	0	0	24.60	4.72	122.70	1					0			
		49	Chikola	House hold																31	Phlot Village	
		49	Chikola	House hold																36		
		50	Chidamsulu	Water hole		703445	9326525	0	0	0	23.50	6.15	21.70	1					4			
		50	Chidamsulu	House hold		703823	9326480	0	0	0	22.00	5.76	17.68	0.5					3			
		51	Winamila	Water hole		708260	9326005	0	0	0	24.10	5.41	82.50	2					4			
		51	Winamila	House hold		707583	9326058	0	0	0	23.20	5.53	80.80	1					0			
52	Heka	Charco Dam		707136	9320077	0	0	0	25.70	5.36	16.41	0					0					
52	Heka	Borehole		706956	9321826	0	0	0	25.60	5.96	309.00	1					5					
53	Sasilo	Water hole		702239	9308582	0	0	0	23.70	4.51	22.70	1					10					
53	Sasilo	House hold		701786	9308905	0	0	0	26.00	5.80	18.36	1					2					
54	Chikombo	Borehole		711300	9317954	0	0	0	27.00	5.91	433.00	2					7					
54	Chikombo	House hold		711536	9317921	0	0	0	23.50	5.95	0.43	2					11					
55	Isseke	Water hole		723075	9288916	0	0	0	23.10	4.24	11.50	1					2					
55	Isseke	House hold		723640	9288700	0	0	0	24.90	4.13	11.65	1					2					
56	Simbanguru	Water hole		722000	9265228	0	0	0	20.90	6.23	16.97	1					1					
56	Simbanguru	House hold		722274	9264006	0	0	0	24.40	6.04	11.76	1					1					
57	Igwamadete	Water hole		733020	9291260	2	2	0	27.60	5.71	11.07	0.5										

Division	Ward	No.	Village	Sample		Grid		Color	Muddiness	Smell	Temper ature C	pH	EC (mS/m)	F ppm	NO3 ppm	NO2 ppm	NH4 ppm	Colon		Remarks	
				Point	Source	X	Y											Bacillus Paper	Bacillus Water Sp.		
		57	Igvamadete	House hold		732980	9291097	2	2	0	21.40	4.55	11.95	0.5				1	15	Pilot Villa	
		58	Mpapa	Dug Well							23.60	6.95	57.50								
	Sanza	59	Sanza	Water hole		744763	9296918	0	0	0	24.40	5.58	147.20	2				1	0		
		59	Sanza	Borehole		744558	9296389	0	0	0	29.00	5.64	244.00	2				0	0		
		59	Sanza	House hold		745178	9296931	0	0	0	30.00	5.59	0.25	2				0	0		
		59	Sanza	House hold		745306	9297077	0	0	0	27.50	5.56	145.60	2				0	0		
		60	Ntope	Water hole		743325	9295766	0	0	0	28.60	5.52	50.10	1				4	0		
		60	Ntope	Water hole		742863	9296502	0	0	0	23.60	6.41	120.70	1				0	0		
		60	Ntope	House hold		743421	9294360	0	0	0	25.30	6.07	115.90	1				0	0		
		60	Ntope	House hold		743260	9294852	0	0	0	22.40	5.62	38.10	1				1	0		
		61	Chicheho	Water hole		745990	9304436	0	0	0	25.30	4.91	29.30	1				0	0		
		61	Chicheho	House hold		744657	9304648	0	0	0	23.70	5.12	30.00	1				0	0		
		62	Ikasi	Borehole		744875	9303982	0	0	0	27.90	5.48	323.00	2				25	0		
		62	Ikasi	House hold		744268	9304862	1	0	0	28.20	4.42	20.91	0.5				0	0		
		63	Msemembo	Borehole		717450	9390790	0	0	0	25.50	6.20	215.00	2				20	0		
	Makuru	63	Msemembo	House hold		717424	9389435	0	0	0	26.00	6.26	0.22	2				7	0		
		64	Saranda	Water hole		718906	9368277	0	0	0	21.50	6.90	57.20	5				0	0		
		64	Saranda	House hold		718390	9368060	0	0	0	20.90	7.10	56.40	5				0	0		
		65	Londoni	Borehole		730456	9410945	0	0	0	27.50	5.94	82.80	0.5				10	0		
		65	Londoni	House hold		730774	9410931	0	0	0	27.30	6.56	82.30	0.5				0	0		
		66	Hika	Water hole		720308	9378871	0	0	0	26.90	7.50	53.30	5				0	0		
		66	Hika	House hold		720020	9378581	0	0	0	20.30	7.20	50.80	5				0	0		
	Kilimatunde	67	Kilimatunde	Borehole		715742	9354736	0	0	0	24.90	5.31	90.80	2				2	0		
		67	Kilimatunde	House hold		717993	9354947	0	0	0	23.60	5.36	92.30	2				36	0		
		68	Solya	Water hole		717121	9355613	1	0	0	24.30	4.93	20.60	1				36	0		
		68	Solya	Borehole		715742	9354736	0	0	0	24.90	5.31	90.80	2				2	0		
		68	Solya	House hold		717348	9354719	0	0	0	22.00	5.32	89.30	2				62	0		
		68	Solya	House hold		716887	9355213	1	0	0	23.00	4.85	20.60	1				29	0		
		69	Sukamahela	Water hole		721443	9361401	2	0	0	23.30	5.21	10.63	0.5				28	0		
		69	Sukamahela	Borehole		720995	9357348	0	0	0	23.50	6.19	170.50	2				26	0		
		69	Sukamahela	House hold		720880	9359343	0	0	0	21.80	6.13	169.80	2				48	0		
		69	Sukamahela	House hold		721376	9361529	0	0	0	21.70	5.24	38.30	1				1	0		
	Majiri	70	Majiri	Charco Dam		723104	9328596	0	0	0	24.50	6.60	34.10	1				2	0		
		70	Majiri	House hold		723009	9330563	0	0	0	24.00	7.10	53.10	1				0	0		
	Sasajila	71	Sasajila	Water hole		713782	9343880	0	0	0	23.90	8.50	16.70	0.5				5	0		
		71	Sasajila	House hold		714886	9343051	0	0	0	25.80	7.80	38.90	0.5				0	0		
		72	Makasuku	Water hole		711135	9350548	0	0	0	22.50	6.50	19.05	0.5				18	0		
		72	Makasuku	House hold		714060	9335968	0	0	0	34.30	6.20	18.31	0.5				27	0		
		Total																			

Division	Ward	No.	Village Name	Sample Point		Grid		Color	Muddiness	Smell	Temperature C	pH	EC (mS/m)	F ppm	NO3 ppm	NO2 ppm	NH4 ppm	Colon Bacillus Paper	Colon Bacillus No. Water Sp.	Remarks
				Point	Source	X	Y													
Majiri	73	Kinangali	Water hole		720384	9334491	0	0	0	25.50	6.80	156.80	1					0		
	73	Kinangali	Water hole		719839	9335184	0	0	0	24.40	7.20	166.40	1					0		
	74	Mpaadagani	Water hole		722374	9343302	0	0	0	25.40	6.70	40.80	1					4		
	74	Mpaadagani	Water hole		722395	9342862	0	0	0	27.60	7.20	47.90	1					1		
	75	Chibumagwa	Water hole		716799	9350163	0	0	0	31.00	6.80	108.10	2					0		
	75	Chibumagwa	Borehole		717467	9351004	0	0	0	34.10	7.30	182.90	1					0		
	75	Chibumagwa	House hold		717722	9351460	0	0	0	22.60	7.50	149.40	1					0		
	75	Chibumagwa	House hold		718150	9349807	0	0	0	27.9	6.50	110.1	2					0		

Water Quality of Target Villages in Iganga District, Tabora Region

Table-1.6.6-4 (4)

Division	Ward	No.	Village	Sample		Grid		Coler	Muddi ness	Smell	Temper ature	pH	EC (mS/m)	F ppm	NO3 ppm	NO2 ppm	NH4 ppm	Colon Bacillus P	Colon Bacillus W/sp	Remarks		
				Point	Source	X	Y															
Mangonga	Mwashinku	1	Matnje	Charco Dam	1	551.57	9554.186	24.5	0.05	20.3										15	Model Village	
		2	Matnje	Charco Dam	2			27.4	9.06	6.03												20
		2	Buchenjegele	Charco Dam			547332	9552870	1	0	1	33.20	6.30	25.00	1.00					17		
		2	Buchenjegele	House hold			546055	9553342	1	0	1	23.80	6.05	24.50	1.00					0		
		3	Mondo	Charco Dam			545506	9562213	0	0	0	26.90	6.37	25.70	1.00					14		
		3	Mondo	Dug Well			545258	9566981	0	0	0	25.40	6.51	57.30	2.00					20		
		3	Mondo	House hold			545507	9562266	0	0	0	22.30	6.33	35.20	1.00					0		
		4	Mwamashiku	Charco Dam			552611	9560913	1	0	2	30.90	6.58	45.30	0.50					2		
		4	Mwamashiku	Water hole			550745	9558993	1	0	0	26.20	6.50	35.10	1.00					18		
		4	Mwamashiku	House hold			550950	9559119	0	0	0	23.80	6.37	40.60	1.00					1		
		Ngulu	Ngulu	5	Ngulu	Dug Well			550876	9538471	0	0	0	30.40	6.66	77.40	2.00					
5	Ngulu			Water hole			549822	9538211	0	0	0	25.70	6.54	59.70	1.00					19		
5	Ngulu			House hold			549980	9538343	0	0	0	25.60	6.65	62.20	1.00					35		
5	Ngulu			House hold			550864	9538542	0	0	0	27.10	6.90	63.00	1.00					38		
6	Imailio			Charco Dam			552554	9543019	0	0	0	29.80	6.27	25.70	1.00					11		
6	Imailio			Charco Dam			554113	9546987	0	0	0	30.30	6.32	29.20	1.00					8		
6	Imailio			House hold			552832	9543049	0	0	0	23.70	6.16	26.00	1.00					0		
6	Imailio			House hold			554178	9546949	0	0	0	23.20	6.03	27.50	1.00					15		
7	Mwansugho			Charco Dam			558172	9549485	0	0	0	26.00	5.84	16.00	0.50					18		
7	Mwansugho			Charco Dam			559490	9552221	0	0	1	25.20	6.29	17.44	0.50					7		
7	Mwansugho			House hold			556559	9549586	0	0	0	24.00	5.79	16.80	0.50					3		
7	Mwansugho	House hold			558667	9552860	0	0	1	23.60	5.95	17.49	0.50					6				
Chomachankola	Chomachankola	8	Chomachankola	Borehole			538620	9554857	0	0	0	27.80	7.25	170.30	1.00					0		
		8	Chomachankola	Water hole			538442	9554506	0	0	0	27.60	7.00	67.30	1.00					5		
		8	Chomachankola	House hold			539234	9555023	0	0	0	26.40	6.70	69.60	1.00					5		
		8	Chomachankola	House hold			540138	9555423	0	0	0	28.10	7.09	186.20	2.00					25		
		9	Chibiso	Charco Dam			541205	9562782	0	2	0	28.40	6.65	30.10	1.00					21		
		9	Chibiso	Water hole			537138	9568501	0	0	0	31.20	7.02	71.10	1.00					3		
		9	Chibiso	House hold			541235	9562852	0	0	0	21.60	6.38	29.70	1.00					7		
		9	Chibiso	House hold			537434	9568197	0	0	0	25.70	6.77	58.70	1.00					0		
Bulangamliwa	Bulangamliwa	10	Bulangamliwa	Charco Dam			546038	9543512	0	0	0	22.20	6.24	25.30	1.00					18		
		10	Bulangamliwa	Water hole			542192	9545689	0	0	0	24.40	6.47	28.70	1.00					8		
		10	Bulangamliwa	House hold			545881	9543398	0	0	0	22.70	6.24	25.00	1.00					10		
		10	Bulangamliwa	House hold			542138	9545251	0	0	0	25.70	6.36	26.20	1.00					2		
		11	Ziba	Dug Well			545036	9529331	1	0	0	26.40	6.82	31.80	2.00					58		
Ziba	Ziba	11	Ziba	Water hole			544286	9530576	0	0	0	26.70	6.38	24.30	1.00					80		
		11	Ziba	Water hole			546003	9531638	0	0	0	26.60	6.70	34.30	1.00					100		
		11	Ziba	House hold			544240	9530591	0	0	0	25.00	6.50	25.00	1.00					41		

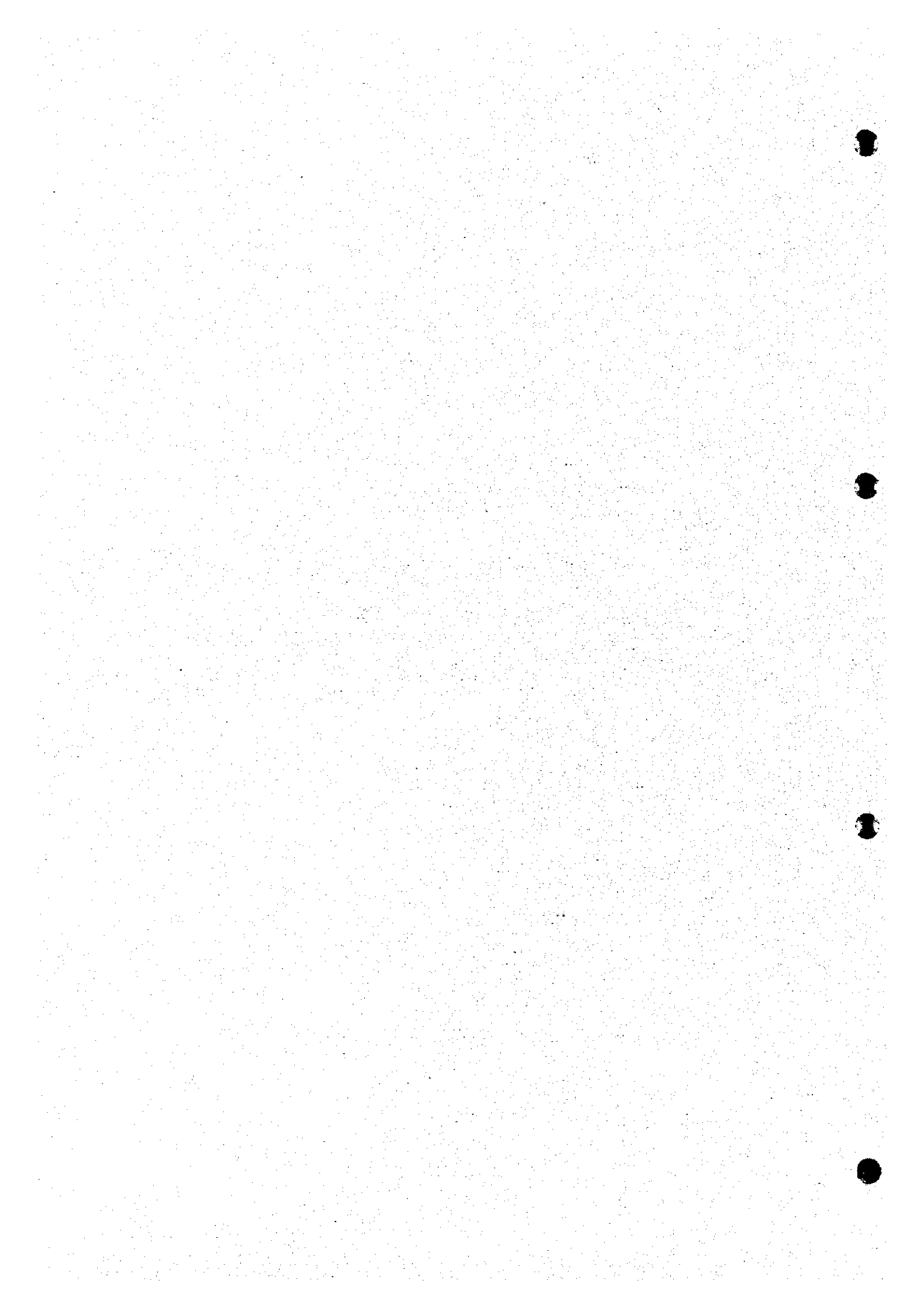
Division	Ward	No.	Village	Sample		Grid		Color	Muddiness	Smell	Temperature	pH	EC (mS/m)	F ppm	NO3 ppm	NO2 ppm	NH4 ppm	Colon Bacillus p	Colon Bacillus Wsp	Remarks
				Point	Source	X	Y													
		11	Ziba	Charco Dam		545105	9531029	0	0	0	26.70	6.70	34.90	1.00				0		
		11	Ziba	Borehole		545537	9529160	0	0	0	30.30	6.90	171.10	2.00				3		
		11	Ziba	House hold		545695	9529098	0	0	0	24.00	6.91	175.10	2.00				3		
		12	Ibologero	Borehole		552143	951868	0	0	0	26.90	7.17	145.00	5.00				2		
		12	Ibologero	Dug Well		553975	9532206	0	0	0	25.60	7.07	98.80	2.00				7		
		12	Ibologero	House hold		551833	9532191	1	0	0	31.20	7.03	102.40	5.00				7		
		12	Ibologero	House hold		554108	9532374	0	0	0	26.00	6.99	102.70	2.00				21		
		12	Ibologero	House hold		551860	9531760	0	0	0	25.00	7.20	147.30	5.00				0		
		12	Ibologero	Water hole		552018	9532083	0	0	0	26.00	7.15	102.20	5.00				56		
		13	Bulumbela	Charco Dam		545281	9540211	1	0	0	24.30	6.30	27.40	1.00				8		
		13	Bulumbela	House hold		545275	9539995	1	0	0	22.20	6.70	27.60	1.00				5		
		13	Bulumbela	House hold		545180	9539968	0	0	0	23.40	6.55	32.80	1.00				60		
		13	Bulumbela	Dug Well		549984	9539737	0	0	0	24.90	7.02	129.50	1.00				38		
		13	Bulumbela	House hold		545028	9539529	0	0	0	21.90	6.77	128.70	1.00				28		
		13	Bulumbela	Water hole		545384	9540023	1	0	0	25.70	6.69	33.50	1.00				28		
		14	Ndembezi	Dug Well	Test BH	545071	9523433				29.40	8.53	12.89						21	Pilot Village
		14	Ndembezi	Dug Well		546230	9522076				25.00	6.65	21.30						0	
		14	Ndembezi	House hold	2 SW						23.40	6.89	16.90						200	
		14	Ndembezi	Dug Well	1	547605	9522426				23.30	8.23	58.80						200	
		14	Ndembezi	House hold	3 SW						22.20	7.20	21.50						0	
		14	Ndembezi	House hold	1 DW						21.00	7.58	48.40						20	
		15	Ntigu	Dug Well		552694	9522759	0	0	0	26.30	7.21	125.80	2.00				60		
		15	Ntigu	House hold		554686	9521822	0	0	0	23.40	6.99	68.40	1.00				11		
		15	Ntigu	House hold		552689	9522664	0	0	0	23.10	7.11	104.70	2.00				5		
		15	Ntigu	Water hole		554750	9521853	0	0	0	24.60	6.98	66.10	1.00				32		
		16	Kitangili	House hold		550810	9159483	1	2	0	23.10	6.45	13.07	1.00				5		
		16	Kitangili	Charco Dam		548960	9520848	1	2	0	25.60	6.89	48.90	2.00				8		
		16	Kitangili	Water hole		550885	9519431	1	0	0	22.50	6.60	12.56	1.00				29		
		17	Moyofuke	Borehole		559538	9520649	0	0	0	28.30	7.74	226.00	1.00				10		
		17	Moyofuke	Charco Dam		560559	9519423	0	0	0	33.60	7.77	272.00	0.50				4		
		17	Moyofuke	House hold		561543	9520564	0	0	0	23.50	7.60	80.50	1.00				90		
		17	Moyofuke	Water hole		561341	9520590	1	0	0	29.20	7.64	80.80	1.00				70		
		18	Nkinga	House hold		549661	9512020	0	0	0	26.20	7.99	40.40	0.50				2		
		18	Nkinga	Dug Well		549252	9510869	0	0	0	27.80	7.32	175.70	2.00				3		
		18	Nkinga	House hold		548283	9510556	0	0	0	26.80	7.02	92.20	2.00				0		
		18	Nkinga	Water hole		549682	9513385	1	0	0	23.10	71.81	38.40	1.00				15		
		18	Nkinga	House hold		548753	9510745	0	0	0	23.70	7.36	139.90	1.00				0		
		18	Nkinga	House hold		549306	9510700	0	0	0	25.20	7.31	173.40	2.00				0		
		18	Nkinga	Borehole		548263	9512020													

Division	Ward	No.	Village	Sample		Grids		Color	Muddiness	Smell	Temper ature C	pH	EC (mS/m)	F ppm	NO3 ppm	NO2 ppm	NH4 ppm	Colon Bacillus P	Colon Bacillus Wsp	Remarks		
				Point	Source	X	Y															
Igurubi		18	Nkinga	Water hole		548824	9510915	0	0	0	25.70	7.49	140.70	2.00				25				
		19	Ulaya	Water hole		547441	9514726	1	2	0	23.50	6.70	15.65	1.00				10				
		19	Ulaya	House hold		547306	9514726	0	0	0	22.10	6.54	16.83	1.00				4				
		20	Ugaka	Dug Well		555617	9516906	0	0	0	25.30	7.73	101.90	2.00				0				
		20	Ugaka	House hold		555614	9516803	0	0	0	22.60	7.59	101.40	2.00				9				
		20	Ugaka	House hold		556295	9516922	0	0	0	23.90	8.13	269.00	2.00				8				
		20	Ugaka	Water hole		556494	9516832	1	2	0	25.80	7.44	263.00	2.00				13				
		21	Mwakabuta	Water hole		565722	9515118	1	0	0	26.30	6.40	14.22	1.00				3				
		21	Mwakabuta	House hold		566065	9515478	1	0	0	22.40	6.69	18.69	1.00				0				
		22	Ikunguipina	Water hole		539724	9508901	1	0	0	25.40	6.82	25.60	1.00				60				
		22	Ikunguipina	House hold		539704	9509005	0	0	0	25.20	6.79	21.50	1.00				0				
		23	Igurubi	House hold							25.20	8.08	24.50							15		
		23	Igurubi	House hold							22.70	8.80	25.80							0		
		23	Igurubi	Water hole	1 Rain V (Dam In 1 (Pump		578561	9558416				22.90	7.68	24.20								
		23	Igurubi	Water hole			578561	9558416				25.00	8.08	32.70								
		24	Mwagala	House hold			574863	9547942	2	2	1	20.10	5.93	66.20	2.00				0			
		24	Mwagala	House hold			576526	9549485	0	0	0	21.20	6.03	77.90	2.00				4			
		24	Mwagala	Water hole			574612	9547877	2	2	1	21.30	5.68	65.30	2.00				10			
		24	Mwagala	Water hole			576572	9549348	0	0	0	21.60	5.84	76.30	2.00				23			
		25	Kalangale	Water hole			571235	9560735	0	0	0	29.00	6.41	60.10	1.00				11			
		25	Kalangale	House hold			571945	9561573	0	0	0	23.60	6.42	58.50	1.00				0			
		Kinungu		26	Kinungu	Water hole		560868	9560867	1	0	0	25.80	6.63	86.30	1.00				15		
26	Kinungu			House hold		561052	9560835	0	0	0	24.80	6.32	56.40	1.00				4				
Mwandihimiji		27	Mwandihimiji	Charco Dam		567036	9559383	0	0	0	24.20	6.49	45.80	2.00				10				
		27	Mwandihimiji	House hold		567172	1559476	0	0	0	21.80	6.32	44.50	2.00				11				
Mwamapuli		28	Mwamapuli	Water hole		560868	9560867	0	0	0	25.80	6.63	86.30	1.00				15				
		28	Mwamapuli	Charco Dam		557285	9559124	0	0	0	24.90	6.44	38.60	1.00				18				
		28	Mwamapuli	Charco Dam		557098	9559278	0	0	0	23.60	6.20	61.00	1.00				10				
		28	Mwamapuli	House hold		560073	9560159	0	0	0	25.30	6.54	69.40	1.00				8				
Mwamashiga		29	Mwamashiga	House hold		570683	9567623	0	0	0	24.70	6.70	109.00	2.00				3				
		29	Mwamashiga	Water hole		572593	9567431	0	0	0	24.40	6.66	93.60	2.00				4				
Ntobo		30	Migongwa	Water hole		579352	9536887	0	0	0	27.80	6.02	54.40	0.50				5				
		30	Migongwa	House hold		579398	9536570	0	0	0	24.60	6.23	50.30	0.50				0				
Ntobo		31	Ntobo	Charco Dam		556746	9539076	0	0	0	27.40	5.55	16.03	1.00				9				
		31	Ntobo	House hold		556672	9539459	0	0	0	24.20	5.43	16.96	1.00				1				
		31	Ntobo	Charco Dam		561656	9549207	0	0	0	24.00	5.92	19.17	2.00				10				
		32	Mwamlioli	House hold		561744	9549340	0	0	0	23.20	5.62	18.97	2.00				1				
Mwamlioli		32	Mwamlioli	Charco Dam		564110	9548121	1	2	0	25.70	6.20	33.10	1.00				4				
		32	Mwamlioli	House hold		564041	9547887	1	2	1	22.00	6.13	32.50	1.00				1				

Division	Ward	No.	Village	Sample		Grids		Color	Muddiness	Smell	Temperature	pH	EC (mS/m)	F ppm	NO3 ppm	NO2 ppm	NH4 ppm	Colon Bacillus P	Colon Bacillus Wsp	Remarks	
				Point	Source	X	Y														
Igunga	Itunduru	33	Mwabubele	Charco Dam		565337	9539055	1	2	1	30.10	5.93	19.72	1.00				8			
		33	Mwabubele	House hold		565358	9539233	0	0	1	25.60	5.95	14.29	1.00				0			
		34	Itunduru	Charco Dam		572010	9542043	0	0	0	26.20	5.58	31.40	1.00				27			
		34	Itunduru	House hold		572110	9542217	0	0	0	26.90	5.57	32.50	1.00				80			
		35	Kagongwa	Water hole		573347	9550988	0	0	0	24.10	5.80	56.30	1.00				12			
		35	Kagongwa	House hold		573188	9551055	0	0	0	20.80	5.88	59.40	1.00				1			
		36	Mwabaraturu	Water hole		572064	9537887	1	2	1	22.60	5.61	19.86	1.00				5			
		36	Mwabaraturu	Charco Dam		570339	9539740	0	0	0	24.30	5.74	8.45	1.00				2			
		36	Mwabaraturu	House hold		570431	9538812	0	0	0	19.00	5.58	11.05	1.00				0			
		36	Mwabaraturu	House hold		572363	9537851	1	2	1	21.50	5.52	20.70	1.00				0			
		37	Mwayunge			597852	9525520						26.10	9.02	28.50				6		Model Village
		38	Nyandekuwa	Dug Well		956572	9531008	0	0	0	25.80	6.89	104.20	2.00					12		
		38	Nyandekuwa	House hold		556871	9530682	0	0	1	24.40	7.14	103.80	2.00					26		
		38	Nyandekuwa	House hold		556975	9530816	0	0	0	25.20	7.10	104.00	2.00					9		
		38	Nyandekuwa	Water hole		556877	9530683	1	1	1	24.80	7.02	103.80	2.00					13		
		39	Ussongo	Water hole		554611	9525571	0	0	0	27.30	6.80	30.10	0.50					40		
		39	Ussongo	Borehole		553790	9524987	0	0	0	28.10	6.93	101.90	2.00					42		
		39	Ussongo	Dug Well		553166	9524361	0	0	0	27.10	7.13	96.10	5.00					22		
		39	Ussongo	House hold		554143	9524948	0	0	0	23.80	6.72	33.60	0.50					24		
		39	Ussongo	House hold		553119	9524348	0	0	0	25.30	7.00	96.50	5.00					81		
		39	Ussongo	House hold		554212	9524814	0	0	0	25.90	6.96	104.30	5.00					0		
		40	Itale	Water hole		558765	9524916	0	0	0	26.80	6.92	21.80	1.00					4		
		40	Itale	Borehole		556074	9522508	0	0	0	28.80	7.28	94.30	1.00					2		
		40	Itale	House hold		558805	9524893	0	0	0	26.10	6.85	21.30	1.00					0		
		40	Itale	Charco Dam		558918	9525252	0	0	0	27.60	7.09	67.40	2.00					27		
		40	Itale	House hold		558935	955432	0	0	0	24.70	7.22	65.30	2.00					3		
		40	Itale	House hold		556309	9523249	0	0	0	25.60	7.14	90.40	1.00					47		
		41	Nanga	Water hole		568964	9529793	0	0	0	29.00	6.35	59.10	1.00					10		
		41	Nanga	Charco Dam		587400	9525842	0	0	0	24.20	6.15	22.00	1.00					98		
		41	Nanga	House hold		566833	9528605	0	0	0	25.10	5.85	21.10	1.00					13		
		41	Nanga	House hold		566833	9528605	0	0	0	24.00	5.71	30.60	1.00					11		
		42	Kaumbu	House hold		568777	9520394	0	0	0	21.70	6.63	52.10	1.00					0		
		42	Kaumbu	Dug Well		566869	9520348	0	0	0	0	0									
		43	Bulyangombe	Water hole		573119	9527790	0	0	0	26.40	6.04	22.20	1.00					24		
		43	Bulyangombe	Water hole		572745	9527766	1	0	0	29.40	6.12	26.30	1.00					4		
		43	Bulyangombe	House hold		573101	9527783	0	0	0	23.90	5.74	22.00	1.00					31		
44	Igogo	Charco Dam	Bulunya	587400	9525342	0	0	0	24.20	6.15	22.00	1.00					98				
44	Igogo	House hold		587370	9525083	0	0	0	26.30	6.61	22.20	1.00					150				
45	Bukoko	Water hole		581063	9515726	0	0	0	25.20	5.91	37.20	1.00					32				

Division	Ward	No.	Village	Sample		Gride		Color	Muddiness	Smell	Temper ature C	pH	EC (mS/m)	F ppm	NO3 ppm	NO2 ppm	NH4 ppm	Colon		Remarks	
				Point	Source	X	Y											Bacillus P	Bacillus Wsp		
		45	Bukoko	House hold		581088	9515759	0	0	0	26.20	6.15	35.30	1.00					73		
		46	Ipumbulya	Water hole		588499	9516972	1	0	1	27.70	5.39	8.46	1.00					15		
		46	Ipumbulya	House hold		588741	9516974	1	0	1	25.20	5.32	8.30	1.00					30		
	Itumba	47	Itumba	Dug Well		594027	9492674				24.80	7.63	18.10						12		
	Lugubu	48	Lugubu	Water hole		595112	9494946	1	0	0	29.50	6.17	25.50	2.00					10		
	Lugubu	48	Lugubu	House hold		594994	9494983	1	0	0	25.10	6.16	28.30	2.00					0		
	Sungwizi	49	Sungwizi	Water hole		557722	9508094	1	0	0	26.30	6.06	13.53	1.00					20		
	Sungwizi	49	Sungwizi	Dug Well		557213	9506504	1	0	0	26.40	6.47	16.52	1.00					11		
	Sungwizi	49	Sungwizi	House hold		557129	9506512	1	0	0	22.70	6.37	13.80	1.00					0		
	Sungwizi	49	Sungwizi	House hold		557729	9507907	0	0	0	22.80	5.90	16.66	1.00					2		
	Ngurū	50	Ngurū	Water hole	1	592839	9489643				27.60	7.06	13.70						12	Pilot Village	
	Ngurū	50	Ngurū	House hold	DW 2						22.90	6.30	24.10						200		
	Ngurū	50	Ngurū	Water hole	2	562926	9507274				24.10	5.98	24.20						200		
	Ngurū	50	Ngurū	Water hole		564055	9508071				23.80	6.89	32.70						200		
	Ngurū	50	Ngurū	House hold															12		
	Ngurū	50	Ngurū	Water hole	(Dam)	565730	9507781				23.90	8.95	64.30						0		
		Total																			

APPENDIX-2



JICA ENVIRONMENTAL GUIDELINES (1992)
SECTOR VIII: GROUNDWATER DEVELOPMENT
(SUMMARY)

Preface	(Abridgement)
Terminology	(Abridgement)
Abbreviation	(Abridgement)

i. Background

Japan International Cooperation Agency (JICA) started to prepare the environmental guidelines for the development survey in 1988. The guidelines consists of "Dam Construction" and the following 13 sectors:

- [I] Port and Harbour
- [II] Air-port
- [III] Road
- [IV] Railway
- [V] River and Sabo
- [VI] Solid Waste Treatment
- [VII] Sewerage
- [VIII] **Groundwater Development** (The present guideline)
- [IX] Water Supply
- [X] Integrated Regional Development
- [XI] Tourism
- [XII] General Transportation
- [XIII] Urban Transportation

ii. Objective of Guidelines

This guidelines aim to forecast environmental issues which may practically arise along with any development, to sufficiently pay environmental considerations, and to be used for screening and scoping of environmental issues in any JICA's preliminary study in the plan formulation on socio-economical infrastructure development schemes.

iii. Use of Guidelines

The guidelines are to be used by staff who are engaged in any preparatory or preliminary study of JICA for the preparation of report or instruction for environmental

considerations. In case that the EIA guidelines of target country are sufficiently available, the study is to follow them. In case that the guidelines of target country are insufficiently or not available, this guideline is to be supplementary used.

Chapter 1: Outline of Environmental Considerations

1.1. Basic Concept

The environmental considerations are defined as "to investigate whether or not major environmental impacts may be generated through a development project, evaluate the outcomes, and formulate counter-measures to avoid or mitigate from the impacts as necessary". The preposition of definition is based on the concept that the development aid is to be not tentative but sustainable. The environmental considerations are an indispensable component to secure the sustainability of any development. In the implementation of any development project in any developing nation under Japan's cooperation, the environmental examination is to be made as in an earlier stage as possible to promote a balancing development in a long-term view.

Since any project in a developing nation is conducted by the decision of its government and in the nation's land, the environmental considerations are to be made through the observation of law, regulation, guideline and measures of the government of nation. JICA's basic strategy in the environmental considerations is set forth at the promotion of sustainable development, basing upon the intention of counterpart government, to up-grade the living standard in a harmony with the appropriate environment.

The present guidelines describe the screening and scoping in the preliminary study on possible negative impacts to the environment in the project area and surroundings to be triggered by the target project. Tables 1.1 and 1.2 show the correlation of project and environmental considerations in each stage.

Table I.1. Correlation of Project and Environmental Considerations in Each Stage

Stage in Project Implementation		Stage in Environmental Considerations
By JICA		
Preliminary Study		Preliminary Environmental Survey
Project Study		
Master Plan Study	Feasibility Study	Initial Environmental Examination (IEE)
Feasibility Study		Environmental Impact Assessment (EIA)
By Implementing Agency		
Formulation of Implementation Plan (inclusive of Detailed Design)		Examination of Environmental Preservation Measures
Project Implementation (Construction)		Implementation of Environmental Preservation Measures
Project Operation		Environmental Monitoring

- Notes:
- (1) The correlation in each stage is not so strict.
 - (2) IEE or EIA is not limited always necessary by project.
 - (3) The detailed design of Environmental Preservation Measures is to be included in the Formulation of Implementation Plan.
 - (4) The shadowed column shows the major extent of the present guideline.

Table 1.2. JICA's Frame Work of Development Survey and Environmental Considerations

Flow of Study Work	Examination/Timing	Examination Items
Project Finding		
Project Finding ↓ Receipt of TOR ↓ Examination of TOR ↓	Provisional Screening (Judgement whether or not IEE or EIA is Necessary)	Not to accept such project which may involve important impacts.
Preliminary Study		
Preliminary Study ↓ Agreement of S/W ↓ Preparation of Preliminary Study Report ↓	Screening (Confirmation of Provisional Screening) Scoping (Decision of major sectors for IEE or EIA)	Stipulation on S/W, M/M and Preliminary Study Report.
Selection of Consultant		
Preparation of TOR for Environ'l Considerations ↓		Extent of works by the Consultant.
Selection of Consultant ↓		Evaluation of consultant's Proposal.
Project Study		
Preparation/Discussion of IC/R ↓ Implement'n of IEE or EIA ↓ Discussion of DF/R ↓ Preparation of F/R		Decision of items for EIA. Supervision of consultant's works and report.

Notes: (1) TOR: Terms of Reference; S/W: Scope of Work; IC/R: Inception Report; DF/R: Draft Final Report; F/R: Final Report.

(2) The shadowed column shows the major extent of the present guideline.

1.2. Outline of Environmental Consideration in Groundwater Development

1.2.1. Coverage of Guideline

This guideline is to cover the plan of groundwater development by means of borehole, tubewell or dug-well for domestic, industrial, agricultural and similar uses, and to not cover such a large-scale plan for groundwater recharge or underground dam scheme.

1.2.2. Typical Impact and Environmental Consideration in the Groundwater Development

The groundwater development is to be implemented for the improvement of hygiene and sanitation conditions and living standard, and is expected to bring positive impacts for living environment.

The following typical negative impacts for environment may be taken place in case that an improper groundwater draft has been made:

Groundwater:

An over-draft of groundwater may cause the drawdown of head and/or exhaust of resource, dries up springs and wells in around, and threaten the daily lives of inhabitants. In case of a coastal area, an over-draft may cause the groundwater pollution by the sea-water intrusion into coastal aquifers.

Thus, the evaluation of both groundwater resource and designed draft is to be carefully evaluated in the environmental considerations.

Land-subsidence:

An over-draft of groundwater may cause the consolidation and shrinkage of cohesive soil layers nearby the aquifers, and a land-subsidence. A land-subsidence may decrease the drainage function on the ground, increase flood damage areas, deform the function of various structures, obstacle the socio-economic activities and increase the cost for urban development cost. In the environmental considerations, a careful examination is to be made on the existing situation of land-subsidence, the present land-use and so forth.

Chapter 2: Project and Site Descriptions

2.1. Basic Concept

The identification of outline of project and environment of project areae in an earlier stage is indispensable for the screening and scoping of environmental impacts. The project description is hereby defined to be the project dimensions related items, those are, the background, objectives, location, implementing agency, beneficial population, size, design,

construction method, operation, maintenance and so forth.

The site description means the natural and social environments and the existing pollution in/around the project area. The most attention is to be paid in the following areas;

- an area where the soil conservation measures are required,
- an area where is facing the desertification,
- an area where in the tropical forest or in water source,
- an area where is precious for the protection, conservation and sustainable use of wild lives,
- an area where is precious in the history, archaeology, land-scape and science,
- an area where the population and industries are concentrated to the extreme extent to generate an environmental issues; and
- an area where is deemed to be specific social value for specific minority group.

2.2. Project and Site Descriptions in the Groundwater Development

The project and site descriptions in the groundwater development plan are to be provided by the formats shown in Tables 2.1 and 2.2.

Table 2.1. Format for Project Description (Groundwater Development)

Items	Description
Project Title	
Background	
Objectives	
Location	
Implementing Agency	
Beneficial Population	
Project Dimensions	
Category	New construction/Rehabilitation
Purpose	Domestic: Agriculture: Industry/Storage Pond/Women's Activity
Water Depth/Quality	Water-source Depth: m, Water Quality:
Major Components	Borehole Drilling: Nos., Delivery/Distribution Pipe: km
Water Storage	No. Of Tanks: , Storage Capacity: m ³
Water Treatment Plant	Methodology: , Capacity: m ³ /day
Appurtenant Facilities	Power Transmission/O&M Facility
Other Specific Items	

Note: Description may be in an extent within available data and information.

Table 2.2. Format for Site Description (Groundwater Development)

Items	Description
Project Title	
Social Environment	
Regional Inhabitants: (Resident/Indigenous people/Awareness of project/others)	
Livelihood Related Facilities: (Borehole/storage-pond/water-supply/electricity-supplies/others)	
Health and Sanitation: (Epidemic-diseases/Hospital/customs/others)	
Natural Environment	
Geomorphology and Geology: (Steep-slope/soft-foundation/marsh/faults/others)	
Groundwater, Lakes, Streams, Climate: (Water quality/quantity/rainfall/others)	
Precious Flora and Fauna; Their Habitats: (National park/habitat for specific species/others)	
Public Pollution	
Cause of Claims: (Interested pollution/others)	
Counter measures: (Institutional measure/compensation/others)	
Other Specific Items	

Note: Description may be in an extent within available data and information.

Chapter 3: Screening

3.1. Basic Concept

The screening is defined to be "to judge whether or not the project is required any examination on environmental impacts". The screening of any project is examined based on the above definition in the present guideline. The judgement whether or not IEE or EIA is necessary is, however, to be based on a concept that not to provide a certain quantitative standard, but to secure a harmony between the sustainable development within the described project and site; and, the daily life of inhabitant and surrounding environment.

3.2. Methodology of Screening

3.2.1. Introduction

JICA's methodology of screening is based on the following intersectional views in addition to the recommendation of OECD (1985):

- Is it anticipated to affect negative impacts to the sustainable productive activities depending mainly on the natural resources ?
- Is it anticipated to affect any remarkable impact to human health ?
- Is it anticipated to introduce any deterioration and/or loss of precious wild lives and their habitat ?
- Is it anticipated to generate unfair impacts to the life and survival of the related population ?

The screening is to be conducted by the sufficient discussion with the counterpart government referring to the present guideline and observing the legislative set-up of the target nation if any.

3.2.2. Screening in Groundwater Development

The screening in the preliminary environmental survey is to be conducted basing on the following concept:

- To not affect negative impact to life and survival of related population, and to secure sustainable regional development and sufficient benefit to socio-economic lives.
- to not give remarkable harm on the existing natural environment, to preserve precious environment and natural resources, and to maintain harmonised environment in future.

The screening is to be conducted through the format shown in Table 3.1.

Table 3.1. Format for Screening (Groundwater Development)

Environmental Items	Description	Evaluation	Remarks (Basis of evaluation)	
A. Social Environment				
1	Resettlement	Due to land acquisition (resident right/transfer of land ownership)	Yes/No/ Unclear	
2	Economic Activities	Loss of productive opportunity, change of economic structure.	Yes/No/ Unclear	
3	Transportation and Life Facilities	Impacts to access to hospital or school by traffic jam or accident	Yes/No/ Unclear	
4	Split of Area	Split of area by interfering of transportation	Yes/No/ Unclear	
5	Historical/Cultural Heritage	Loss and damage of heritage	Yes/No/ Unclear	
6	Water Right/Right of Common	Interfere on fishery right, irrigation water right and others	Yes/No/ Unclear	
7	Health/Sanitation	deterioration due to waste generation or unfavourable insects.	Yes/No/ Unclear	
8	Solid Waste	Construction waste, excavated soil, used mud, solid waste, etc.	Yes/No/ Unclear	
9	Disaster (Risk)	Increase risks for land-creep, subsidence, accident, others.	Yes/No/ Unclear	
B. Natural Environment				
10	Topography/ Geology	Deformation of precious landscape or geological site, others.	Yes/No/ Unclear	
11	Soil Erosion	Due to site preparation	Yes/No/ Unclear	
12	Groundwater	Drawdown of head and related pollution due to overdraft.	Yes/No/ Unclear	
13	Hydrologic Regime of Lake/River	Change of flow rate/water quality by reclamation or waste water.	Yes/No/ Unclear	
14	Sea Coast	Erosion or sedimentation in coast by reclamation/others.	Yes/No/ Unclear	

Environmental Items	Description	Evaluation	Remarks (Basis of evaluation)
B. Natural Environment (continued)			
15	Fauna/Flora	Impacts to ecosystem due to environmental change of habitat.	Yes/No/Unclear
16	Climate	change in temperature, rainfall, wind blow due to new structure.	Yes/No/Unclear
17	Landscape	Change of topography by construction, harmony with new structure.	Yes/No/Unclear
C. Public Pollution			
18	Air Pollution	Due with exhausted poisoned gas from vehicles or workshop.	Yes/No/Unclear
19	Water Pollution	Due to contamination of drilling waste, oil, lubricants, others.	Yes/No/Unclear
20	Soil Pollution	Due to runoff and dispersion of waste water, pollutants, others.	Yes/No/Unclear
21	Noise/Vibration	Generated by drilling and water pumping, others.	Yes/No/Unclear
22	Land Subsidence	Deformation of ground surface due to groundwater overdraft.	Yes/No/Unclear
23	Offensive Odour	Due to exhaust gas, use of odourful material, others.	Yes/No/Unclear
Synthetic Evaluation:		Is IEE or EIA required for the project ?	Yes/No

Chapter 4: Scoping

4.1. Basic Concept

The scoping is to identify important environmental impacts in a development project, and to clarify strategic sectors and items to be covered by environmental impact survey.

4.2. Methodology of Scoping

4.2.1. Introduction

Several methods are taken into the scoping and EIA such as "Check-list", "Matrix", "Overlay", "Network" and so forth. The "Check-list" and "Matrix" methods are to be used in the scoping in this Guidelines.

The synthetic matrix for 13 sectors of JICA Guidelines is shown in Table 4.1 for reference.

4.2.2. Scoping in Groundwater Development

A check-list for the scoping in Groundwater Development and a matrix to identify the relation between development activities and environmental items are shown in Tables 4.2 and 4.4 respectively.

In the application of check-list in the scoping, the following conditions and processes are to be taken:

- (1) Conditions for examination:
 - The period of examination is to be both before and after the operation of project.
 - The spatial extent is to be not only around boreholes/wells site but also the groundwater basin where the boreholes/wells are.
 - Target environmental impacts are, in principle, to be those negative impacts which may reflect to the existing environment.
- (2) Evaluation of major item and sector:

The evaluation is to be made in the following four categories:

 - A: The item which is anticipated a major impact.
 - B: The item which is anticipated a some impact .
 - C: The item on which any impact is unclear at present, and a further examination is required.
 - D: The item on which any impact is not anticipated and further IEE and EIA are not required.

The major item and sector which require the IEE and EIA are to be judged by

referring to the "Explanatory Note by Environmental Item" shown in Table 4.7.

(3) Synthetic Evaluation

The synthetic evaluation is to be made through the results of evaluation made by each environmental item in the check-list and the description of basis of evaluation in Table 4.2. Referring to the concept of scoping (refer to Table 4.4) with and a judgement whether or not the IEE or EIA is required, the outline of further survey is to be described by the items in the categories A to C in the format shown in Table 4.5.

Table 4.1. Synthetic Matrix for 13 Sectors of JICA Guidelines

Environmental Items Sectors	Social Environment 't a								Natural Environment 't a									Public Pollution						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
Individual Project																								
1. Port & Harbour	⊙	○	○		○	⊙		○	○	○			○	⊙	⊙		○	○	○	○			○	
2. Airport	⊙	○	○	○	○	○		○	○	○	○		○	○	⊙		○	○	○		⊙			
3. Road	⊙	○	○	○	○	○		○	○	○	○	○	○	○	⊙		○	⊙	○	○	⊙			
4. Railway	⊙	○	○	○	○	○	○	○	○	○	○	○	○	○	⊙		○		○		⊙			
5. River & Sabo	⊙		○	○	○	⊙		○		○			⊙	○	⊙		○		○		○			
6. Solid Waste	○		○				○	○					○	○	○	○		○	⊙	⊙	○	○	⊙	
7. Sewerage	○						○								○		○	○	○		○		○	
8. Groundwater						○						⊙						○		○	⊙			
9. Water Supply	○					○							○		○		○		○		○			
Integrated Development																								
10. Reg'l Develop't	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
11. Tourism	○	○	○	○	○	○	○	○	○	○	○		○	○	○		○		○		○			
12. Gen'l Transport	○	○	○	○	○	○	○	○	○	○	○		○	○	○	○	○	○	○	○	○	○	○	
13. Urban Transport	○	○	○	○	○			○	○				○		○		○	○		○	○			

Notes: ⊙: Environmental item which may relate to the realisation of project in accordance with potential magnitude of impact and counter-measure; and specific attention is to be paid.

○: Environmental item which may involve a possible large impact in accordance with project size and the situation of project area.

Blank: Environmental item which is deemed to generate minor impact and detailed examination may not required.

Table 4.2. Check-List For Scoping (Groundwater Development)

Environmental Items		Eva'n	Basis of Evaluation
Social Environment			
1	Resettlement		
2	Economic Activities		
3	Transport/Life Facilities		
4	Split of Area		
5	Historical/Cultural Heritage		
6	Water/Common Right		
7	Health/Sanitation		
8	Solid Waste		
9	Disaster (Risk)		
Natural Environment			
10	Topography/Geology		
11	Soil Erosion		
12	Groundwater		
13	Regime of Lake/River		
14	Sea Coast		
15	Fauna/Flora		
16	Climate		
17	Landscape		
Public Pollution			
18	Air Pollution		
19	Water Pollution		
20	Soil Pollution		
21	Noise/Vibration		
22	Land Subsidence		
23	Offensive Odour		

Notes:

- (1) Evaluation Category: A: The item which is anticipated a major impact; B: The item which is anticipated a some impact; C: The item on which any impact is unclear at present, and a further examination is required; D: The item on which any impact is not anticipated and further IEE and EIA are not required.
- (2) The related "Explanatory Notes by Environmental Item" shown in Table 4.7 are to be referred in the evaluation.

Table 4.4. Matrix to be used for Preliminary Study (Groundwater Development)

Major Activities	Environ't Items	So cial En vir on m en t									Na tur al En vir on m 't							Pu bli c Po llu t'n							
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
	Synthetic						○													○		○	◎		
Pump- ing Facili- ty	Before O pe rat io n																								
	Topography																								○
	Change																								
	Site-machine																								○
	Operation																								
	After Ope rat io n																								
Spatial																									
Occupation																									
Facility																									
Operation							○														○		○	◎	

Notes: ◎: Environmental item which may relate to the realisation of project in accordance with potential magnitude of impact and counter-measure; and specific attention is to be paid.

○: Environmental item which may involve a possible large impact in accordance with project size and the situation of project area.

Blank: Environmental item which is deemed to generate minor impact and detailed examination may not required.

Table 4.5. Synthetic Evaluation (Groundwater Development)

Environmental Items	Evaluation	Outline of Further Survey	Remarks

Notes:

(1) Evaluation Category:

- A: The item which is anticipated a major impact;
- B: The item which is anticipated a some impact;
- C: The item on which any impact is unclear at present, and a further examination is required;
- D: The item on which any impact is not anticipated and further IEE and EIA are not required.

Table 4.7. (1) Explanatory Notes (Groundwater Development)

Item	6. Water Right/Right of Common
Description	Interfering to vested water right and others
Component of Cause	1. Drawdown of groundwater head by the over-draft.
Possible Environmental Impact	1. Decrease of yield of the existing borehole/well nearby new borehole/well. 2. Possible drying-up of the existing private dug-well. (Note) In case of a large scheme such as the groundwater recharge and underground dam, the impact may be more larger.
Components usable in Evaluation	1. The existing boreholes/wells are densely installed around the project area. 2. The present groundwater head in the project area is already drawing down. 3. A large amount of groundwater is used for irrigation purpose. 4. A tribal group forming specific community resides in the project area.
Counter-measures, others	1. Opening the project information to public and implementation of public relations. 2. Compensation of alternative water. 3. Control of irrigation water use. 4. Formulation of groundwater use plan; prioritisation of domestic use.
Related Further Survey	1. Inventory survey on the existing groundwater use focusing in women participation. 2. Identification of groundwater resources. 3. Inventory survey on the regional sociology.

Table 4.7. (2) Explanatory Notes (Groundwater Development)

Item	12. Groundwater
Description	Drawdown of groundwater head by the over-draft and associated groundwater pollution.
Component of Cause	<p>1. Over-draft of groundwater in the project operation.</p> <p>(Note) In case of groundwater recharge and underground dam, groundwater flow regime may be largely changed, but a great merit in the groundwater development could be expected.</p>
Possible Environmental Impact	<p>1. Drawdown of groundwater head, drying-up of groundwater resource, spring and the existing borehole/well may be taken place, hence the negative impact on the lives of inhabitants would be anticipated.</p> <p>2. In the coastal area, groundwater pollution may be taken place due to drawdown of groundwater head, and sea-water intrusion into aquifers.</p>
Components usable in Evaluation	<p>1. Shallow well receives more impact.</p> <p>2. The present groundwater head in the project area is already drawing down.</p> <p>3. A large amount of groundwater is used for irrigation purpose.</p> <p>4. A more attention is required in case that the project area is nearby the sea coast.</p>
Counter-measures, others	<p>1. Control of irrigation use.</p> <p>2. Formulation of groundwater use plan.</p> <p>3. Compensation of alternative water.</p>
Related Further Survey	<p>1. Hydrogeological study (identification of groundwater resources).</p> <p>2. Pumping test.</p> <p>3. Examination of project in another nature.</p> <p>4. Inventory survey of the existing groundwater use.</p>

Table 4.7. (3) Explanatory Notes (Groundwater Development)

Item	19. Water Pollution
Description	Contamination of drilling mud or oil/lubricants with river and groundwater
Component of Cause	<ol style="list-style-type: none"> 1. Mixing of underground layers and use of mudwater, oil and lubricants during drilling of borehole/well. 2. Drawdown of groundwater head by over-draft. <p>(Note)</p> <ol style="list-style-type: none"> 1. In case of recharge project: pollution of surface runoff due to soil erosion. 2. In case of underground dam project: groundwater pollution by mud, cement or chemicals.
Possible Environmental Impact	<ol style="list-style-type: none"> 1. Impact to the existing groundwater use due to groundwater pollution during the construction. 2. Groundwater pollution due to drawdown of groundwater head by over-draft in the project operation. 3. Groundwater pollution in the coastal area due to the sea-water intrusion.
Components usable in Evaluation	<ol style="list-style-type: none"> 1. Shallow well receives more impact. 2. The present groundwater head in the project area is already drawing down. 3. A large amount of groundwater is used for irrigation purpose. 4. A more attention is required in case that the project area is nearby the sea coast. 5. A more attention is required in case that the factories, solid waste plant, no sewerage plant are in the project area.
Counter-measures, others	<ol style="list-style-type: none"> 1. Prevention of over-draft of groundwater. 2. Formulation of groundwater use plan. 3. Provision of sewerage plant.
Related Further Survey	<ol style="list-style-type: none"> 1. Hydrogeological study (identification of groundwater resources). 2. Hydrochemical analysis on sea-water, surface water and groundwater. 3. Inventory survey of the existing land use. 4. Inventory survey of the existing groundwater use.

Table 4.7. (4) Explanatory Notes (Groundwater Development)

Item	21. Noise/Vibration
Description	Generation of noise/vibration by drilling and other on-site machines and vehicles.
Component of Cause	<ol style="list-style-type: none"> 1. On-site machines and vehicles in drilling and other construction works during several month to one year period. 2. Water pumping during the project operation.
Possible Environmental Impact	<ol style="list-style-type: none"> 1. Impacts to human daily life, escape of wild animals, growing and propagation of livestock. <p>(Note) In case of a large scheme such as the groundwater recharge and underground dam, the impact may be more larger.</p>
Components usable in Evaluation	<ol style="list-style-type: none"> 1. The project area where is nearby a densely populated area and/or public premises such as hospital, school, etc. 2. An area where is nearby the livestock breeding and/or habitat of precious wild life. 3. An area where is made of soft foundation.
Counter-measures, others	<ol style="list-style-type: none"> 1. Use of low-noise and low-vibration machines. 2. Management of working hour. 3. Revision of project area.
Related Further Survey	<ol style="list-style-type: none"> 1. Inventory survey on the present land use. 2. Geological investigation. 3. Survey on live behaviour of precious wild life.

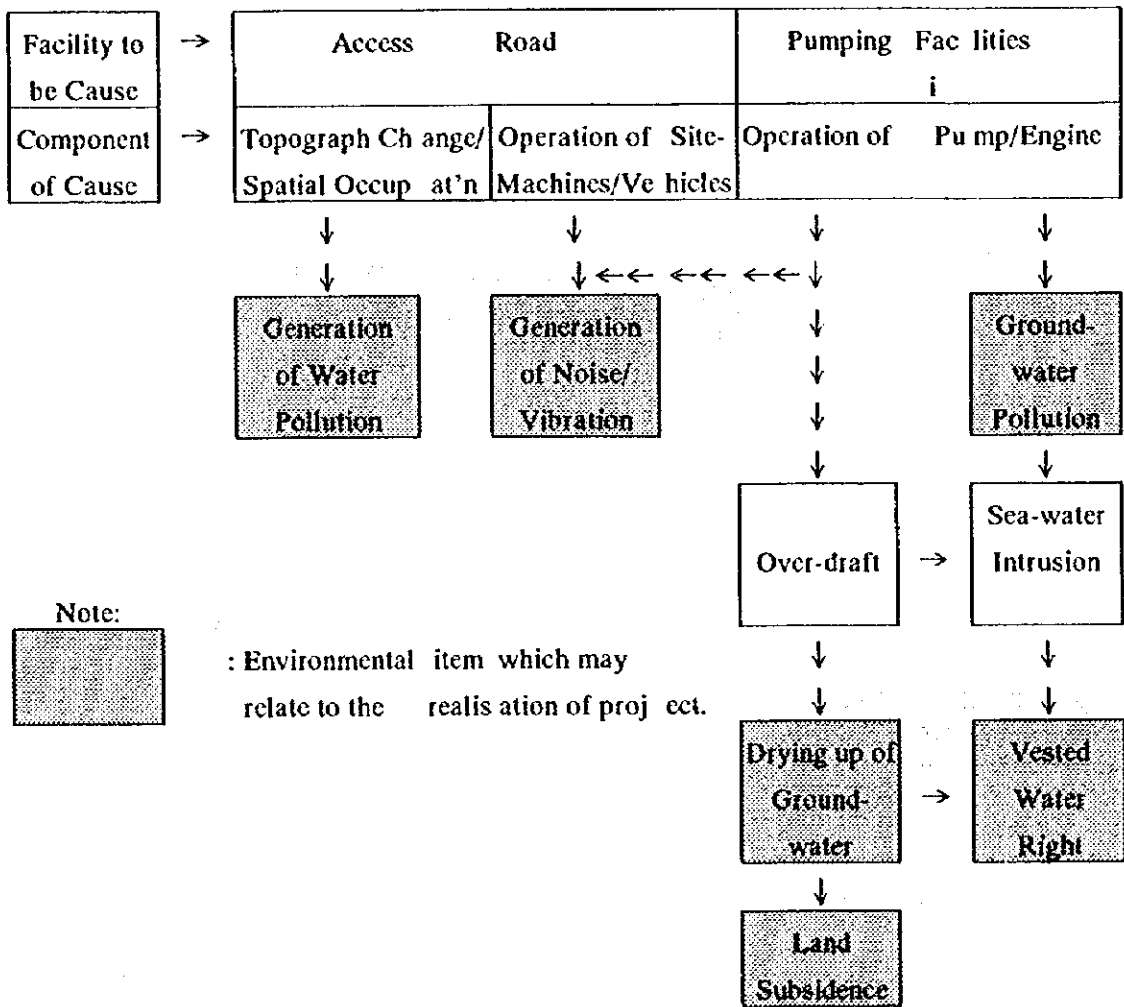
Table 4.7. (5) Explanatory Notes (Groundwater Development)

Item	22. Land Subsidence
Description	Land deformation due to drawdown of groundwater head by the over-draft.
Component of Cause	1. Over-draft of groundwater.
Possible Environmental Impact	1. Consolidation and shrinkage of cohesive soil layers due to drawdown of groundwater head. 2. Expansion of flood damage area due to malfunction of drainage system, obstacle on the socio-economic activities and increase of urban development cost due with deformation and malfunction of infrastructure.
Components usable in Evaluation	1. The present groundwater head in the project area is already drawing down. 2. An area where cohesive soil layer is thickly deposited. 3. An area where the existing borehole/well is drying up or malfunctioned. 4. An area where the land subsidence is already taken place.
Counter-measures, others	1. Formulation of groundwater use plan. 2. Control of over-draft of groundwater.
Related Further Survey	1. Hydrogeological investigation and study. 2. Inventory survey on the existing water use. 3. Survey on the existing institutional and legislative set-ups. 4. Geological investigation and study.

4.3. Extension of Environmental Impacts

In the implementation of socio-economic development project, direct environmental impacts may initially be taken place, and hence, indirect impact may be extended as well. The extending flow of environmental impacts in the groundwater development sector is shown in Figure 4.1 below:

Table 4.8. Extending Flow of Environmental Impacts in Groundwater Development



Chapter 5. Collection of Information Related to PES, IEE and EIA

5.1. Items to be discussed with the Counterpart Government in Screening and Scoping

The items to be discussed with the recipient government on the screening and scoping in the stage of preliminary study are to be the environmental items in the check-list shown in Chapter 4 (Scoping).

In order to smoothly make the discussion, it is recommended to require to the related personnel of the counterpart government to collect necessary information in advance. Out of environmental items, those items which involve a possibility to generate major issues in future, such as security, resettlement, health/sanitation, economy, culture, etc. are to be discussed in priority.

5.2. Existence of Legislative Set-up on EIA and Its Counter-measure

In case that any legislative set-up on EIA is existing in the counterpart government, a sufficient discussion is to be made on the application of existing legislative(s) and supplemental use of this guidelines. In case that any legislative set-up on EIA is not available in the counterpart government or not suitable for the specific project, the discussion is to be carefully made to clarify the major issues in consideration of various situation of the country and this guidelines.

5.3. Collection of Related Information in Preliminary Study (Abridgement)

Chapter 6. Preparation of Report (Abridgement)

Chapter 7. Content of Terms of Reference (Abridgement)

[Appendices]

Appendix 1: References for Screening and Scoping (Abridgement)

Appendix 2: Example and Explanation on Environmental Issues in Groundwater Development (Abridgement)

Appendix 3: Example of Counter-measures on Environmental Impact in Groundwater Development (Abridgement)

APPENDIX-3

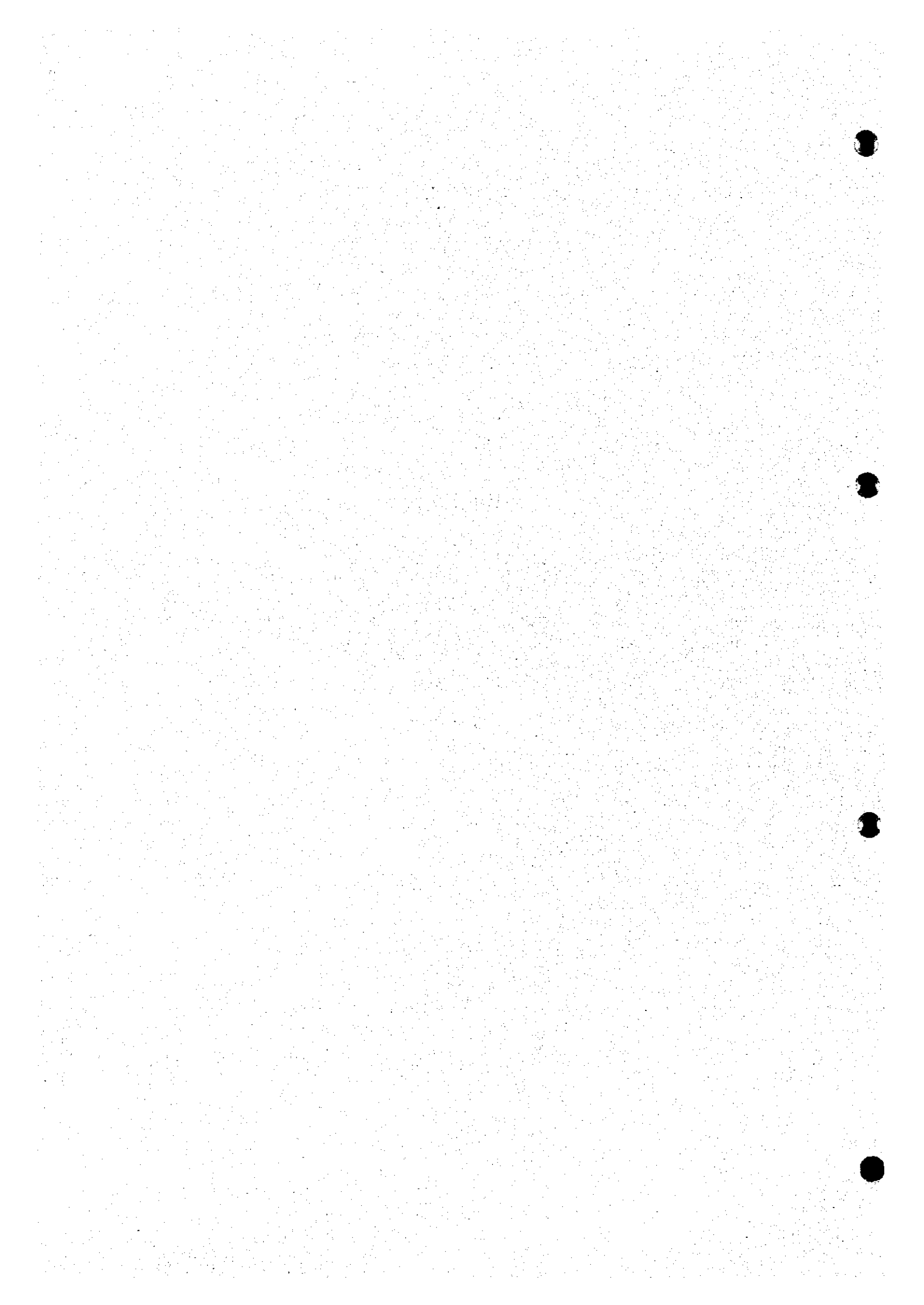


Table 3.1(1) Selected Socio-economic Indexes of Target Villages

District: Hanang

Villages	Population	Household Income	Livestock	Water Supplies
Division: Bassotu Ward : Bassotu 1. Mulbadaw 2. Dang'aida	A D	B C	A A	D D
Ward : Laghanga 3. Dajamet 4. Laghanga 5. Gawidu	D C C	C A B	A A A	D D D
Ward : Bassodesh 6. Garwja 7. Bassodesh 8. Gaghata	A C C	C D A	A A A	D D D
Ward : Hirbadaw 9. Hirbadaw 10. Mwangé	A A	A D	A C	C D
Ward : Gatanuwas 11. Wandele 12. Gidika	D D	D A	A A	D D
Division: Katesh Ward : Mogitu 13. Dumbeta	D	B	A	D
Ward : Nangwa 14. Dirma	C	B	A	D
Ward : Gisambalang 15. Gisambalang 16. Waranga	C D	D D	C C	D D
Ward : Balangdalalu 17. Murero 18. Diloda	D D	B B	A D	D D
Ward : Gehandu 19. Mingenyi 20. Ishponga	B D	C B	D A	D D
Division: Endasak Ward : Measkron 21. Mara	C	D	D	D
Ward : Gidahababieg 22. Gidahababieg 23. Endasaboghechan	B B	C C	B C	B D
Ward : Hidet 24. Hidet 25. Bassotughang	C D	D C	B B	D D
Ward : Sirop 26. Sirop 27. Matangarinu	C C	C D	B C	C B
Ward : Simbay 28. Simbay 29. Gidagharabuk	D D	D C	A A	D D
Ward : Masakta 30. Masakta 31. Lambo	A B	B C	D C	D D
Ward : Maskaroda 32. Maskaroda 33. Getasum	B D	C C	B B	D D

Table 3.1(2) Selected Socio-economic Indexes of Target Villages

District: Singida Rural

Villages	Population	Household Income	Livestock	Water Supplies
Division: Ikungi Ward : Ikungi 1. Ikungi 2. Ighuka 3. Uliyampiti 4. Matongo 5. Muungano 6. Matare 7. Mahambe	B A C B D A D	C D C A A C B	B C A A B B B	C A B A C A
Ward : Issuna 8. Issuna 9. Choda 10. Mkiwa 11. Nkuhi	A D C C	A A A A	B A A A	D D B D
Ward : Dung'unyi 12. Samaka 13. Ujaire 14. Kipumbuiko 15. Mkinya	A C C C	B C C D	B B C B	A A A A
Ward : Mang'onysi 16. Mang'onysi 17. Tupendane 18. Mwau 19. Sambaru	C D A D	C B A D	B B B B	D D C A
Division: Ihanja Ward : Ihanja 20. Ihanja 21. Isseke 22. Nkoiree 23. Unyangwe 24. Chungu	A C A C B	B C C C D	C C B B B	C A A A A
Ward : Minyughe 25. Minyughe 26. Misake	C B	A C	B B	A C
Ward : Muhintiri 27. Muhintiri 28. Mnyange 29. Mpetu	B C D	B A D	A A A	D D C
Ward : Puma 30. Matyuku 31. Utaho 32. Isalanda 33. Kituntu 34. Msambu 35. Nkuninkana 36. Wibia	C B D B C C C	A B D C B D C	B C C D B B C	B B B B A A A
Division: Sepuka Ward : Sepuka 37. Msimi 38. Msungu 39. Kintandaa 40. Mang'ana 41. Mtunduru	A A A B A	A A B A A	D C B C C	C B B A A
Ward : Mwaru 42. Mwaru 43. Mlandala 44. Igombwe 45. Msosa	B B C D	C A A A	A A A A	B D D D
Ward : Mgungira 46. Mgungira 47. Ufana 48. Iyumbu	C D B	B D A	A A A	D D D

Villages	Population	Household Income	Livestock	Water Supplies
Ward : Irisya 49. Irisya 50. Mwasutianga	B D	A A	B B	B A
Division: Ntinko Ward : Ntinko 51. Ntinko 52. Malolo 53. Munghanga 54. Mpambaa 55. Kijota 56. Nduu 57. Minyonyo 58. Ikiwu	A A A A C C A A	C A C A A D A A	C C C B B C C C	B C D B C C D B D
Ward : Makuro 59. Makuro 60. Ghalunyangu 61. Mpipiti 62. Mpoku 63. Matumbo 64. Mkongo 65. Migugu	B B A A A B B	A C B D B A A	D C C D D D D C	D D C A C C B
Ward : Ughandi 66. Ughandi 'B' 67. Nkwae 68. Laghanida 69. Misinko 70. Ntondo 71. Msisi 72. Senene Mfuru	B C B A D A D	B A A B B B B	C D A C B B B	B D E C A B C
Division: Ilongero Ward : Ilongero 73. Madamigha 74. Mrama 75. Mwahango 76. Mwakiti 77. Itamuka 78. Sekoutuure	A A C B C B	B B B D B A	D D C D D D	C C D C A C
Ward : Kinyeto 79. Kinyeto 80. Ntunduu 81. Mkimbii 82. Minyaa 83. Igauri 84. Ntonge 85. Mughamo	B A C C C B A	B C B A C C A	D D C C D D D	A A A A A A B
Ward : Merya 86. Merya 87. Mvae 88. Makhandi 89. Kinyagigi 90. Mwanyonye	A A A B A	A A B B B	D C D C D	C D D C B
Ward : Ikhanoda 91. Ikhanoda 92. Mjughuda 93. Msimihi 94. Mdilu 95. Mwasauya 96. Ngamu	B A A B A A	B A C A B A	D C D C C	C C B D D D
Ward : Maghojoa 97. Mipilo 98. Mangida 99. Sefunga 100. Ghata 101. Msange	A A B A A	A A A B A	C C C D D	C D D D C

(to be continued)

Villages	Population	Household Income	Livestock	Water Supplies
Division: Mgori Ward : Mgori 102. Mgori 103. Mkhola 104. Sughana 105. Unyampanda 106. Mughunga 107. Nduamughanga	C B B D D D D	D B B C D D D	A D D B B B B	B B D D D D D
Ward : Ngimu 108. Ngimu 109. Mwighanji 110. Itaja 111. Pohama	A B A A A	C A B B B	C C C C C	D B C C B
Division: Mungaa Ward : Mungaa 112. Mungaa 113. Minyinga 114. Kintu 115. Kimbwi 116. Unyamighumbi	B B B B B B	D D C C C D	C B D B B D	D A B E C C
Ward : Misughaa 117. Misughaa 118. Msule 119. Sakaa 120. Mnane 121. Nkundi	D D D C C C	C D E B B A	C B D B B D	D D D B C C
Ward : Siuyu 122. Siuyu 123. Unyankanya 124. Mkunguakihendo	B B B B	D D D C	D D B B	C A D D
Ward : Ntuntu 125. Ntuntu 126. Ntewa 127. Mampando 128. Lighwa 129. Mwisi	C A B C C C	A B B C C C	C A B A D D	B A A A A A

Table 3.1(3) Selected Socio-economic Indexes of Target Villages

District: Manyoni

Villages	Population	Household Income	Livestock	Water Supplies
Division: Manyoni Ward : Manyoni				
1. Manyoni	A	D	D	B
2. Kipondoda	A	D	D	C
3. Mwanzi	D	D	B	A
4. Muhalala	C	C	C	B
5. Mdunundu	C	C	C	D
6. Mitoo	D	A	C	C
7. Mkwese	B	D	C	B
8. Kinangali	B	C	C	D
Ward : Aghondi				
9. Aghondi	D	D	D	B
10. Mabondeni	D	D	A	B
11. Majiri	D	C	C	D
12. Kamenyanga	D	B	B	A
Ward : Idodyandole				
13. Idondyandole	C	B	B	C
14. Mbungani	C	C	B	C
15. Kashangu	D	A	D	D
Division: Itigi Ward : Itigi				
16. Itigi	A	D	D	C
17. Doroto	D	D	A	C
18. Kitaraka	D	D	A	C
Ward : Sanjaranda				
19. Sanjaranda	C	C	A	C
20. Gurungu	D	C	A	C
21. Kitopeni	C	A	B	C
Ward : Ipande				
22. Ipande	B	D	A	B
23. Muhanga	C	C	A	B
24. Damweu	D	D	A	C
Ward : Mgandu				
25. Mgandu	A	A	D	B
26. Kalangali	D	C	D	D
27. Itagata	D	B	A	A
28. Kayui	C	A	C	A
29. Makale	B	A	C	A
Ward : Rungwa				
30. Rungwa	C	D	D	D
31. Mwanagembe	C	A	D	D
32. Kitanula	D	B	D	D
Division: Kintinku Ward : Maweni				
33. Maweni	B	D	A	D
34. Mvumi	D	D	A	A
35. Ngaiti	C	C	A	A
Ward : Chikuyu				
36. Chikuyu	B	D	C	A
37. Mbwasa	C	D	A	B
38. Mwiboo	B	D	D	C
39. Makutupora	D	D	B	D
Ward : Makanda				
40. Makanda	D	D	A	D
41. Mangasai	D	C	A	D
42. Kitalalo	D	D	A	D
Ward : Kintinku				
43. Kintinku	D	A	C	A
44. Lusilile	A	A	B	B
45. Udima	C	D	A	A

(to be continued)

Villages	Population	Household Income	Livestock	Water Supplies
Division: Nkonko Ward : Nkonko 46. Nkonko 47. Mpola 48. Ntunbi	B D C	B D D	D A A	B A D
Ward : Chikola 49. Chikola 50. Chidamsulu 51. Winamila	C D D	B B B	A A B	D D D
Ward : Heka 52. Heka 53. Sasilo 54. Chikombo	A B B	D D C	B A D	C C C
Ward : Isseke 55. Isseke 56. Simbanguru 57. Igwamadete 58. Mpapa	D D C C	D A B C	B C D D	C D D D
Ward : Sanza 59. Sanza 60. Ntope 61. Chicheho 62. Ikasi	B B D D	D B A A	C C A A	C D D D
Division: Kilimatinde Ward : Makuru 63. Msemembo 64. Saranda 65. Londoni 66. Hika	B B D D	C D D D	D D D D	C D A C
Ward : Kilimatinde 67. kilimatinde 68. Solya 69. Sukamahela	D C A	D D D	D D D	D A A
Ward : Majiri 70. Majiri	B	C	A	C
Ward : Sasajila 71. Sasajila 72. Makasuku	D D	A D	A B	D D

Table 3.1(4) Selected Socio-economic Indexes of Target Villages

District: Igunga

Villages	Population	Household Income	Livestock	Water Supplies
Division: Mangonga Ward : Mwashinku 1. Matinje 2. Buchenjejele 3. Mondo 4. Mwashiku	A A B C	A A C B	D D C D	A B B C
Ward : Ngulu 5. Ngulu 6. Imalilo 7. Mwansughu	C B B D	C B B C	B B B A	B B B C
Ward : Chamachankola 8. Chamachankola 9. Chibiso 10. Bulangamilwa	A B A	C A B	D B B C	B C C C
Ward : Ziba 11. Ziba 12. Iborogelo 13. Bulumbela	A A B	C C B	C C A	B B B B
Ward : Ndembezi 14. Ndembezi 15. Ntigu 16. Kitangili 17. Moyofuke	A D A C	B D B C	C C C C	C C B B
Ward : Nkinga 18. Nkinga 19. Ulaya 20. Ugaka 21. Mwakabuta 22. Tkunguioina	A B B C D	C C D B B	A B B A B	B C B C C
Division: Igurubi Ward : Igurubi 23. Igurubi 24. Mwagala 25. Kalangale	A C C	A A B	C C C	B C C
Ward : Kinungu 26. Kinungu 27. Mwandihimiji 28. Mwamapuli 29. Mwajilunga	B B B D	A B D C	C B B A	C B A C
Ward : Mwamashiga 30. Migongwa	C	B	B	B
Ward : Ntobo 31. Ntobo 32. Mwamloli 33. Mwabubele	B C C	C C A	B A B	B B B
Ward : Itunduru 34. Itunduru 35. Kagongwa 36. Mwabaraturu	A D A	B C B	B B D	B C A
Division: Igunga Ward : Igunga 37. Igunga	A	C	D	B
Ward : Nyandekuwa 38. Nyandekuwa 39. Ussongo 40. Itale	A B C	C C B	D C C	B B B B

(to be continued)

Villages	Population	Household Income	Livestock	Water Supplies
Ward : Nanga 41. Nanga 42. Kaumbu 43. Bulyangombe 44. Igogo	B A A C	A A B B	B B B B	C B C A
Ward : Bukoko 45. Bukoko 46. Ipumbulya	B B	B C	A C	C C
Ward : Itumbu 47. Itumbu	D	D	A	A
Ward : Lugubu 48. Lugubu	D	D	A	B
Ward : Sungwizi 49. Sungwizi 50. Nguriti	B A	D D	B C	B B