

Monitoring Sheet for Simple Weir Schemes Constructed in 2014 (As of End of October, 2014)

Achievement (New Sites)

No.	Province	District	Camp Name	Name of the BEO/CEO	SiteName	No. of member farmers			No. of farmers already irrigating	No. of member Household	Done in This Dry Season(2014)			No. of Fish Pond made using COBSI irrigation
						Male	Female	Total			Canal Length dug in 2014 (km)	Open Area in 2014 (lima)	Actual irrigated Area in 2014 (A)	
1	Northern	Kasama	Mulronge	Francis.K.Bualya	Muwkonge	9	5	14	0	14	1.00	0.00	4.00	0
2	Northern	Kasama	Milungu west	Kanda Prudence	Cihlyneka1	15	37	52	42	52	2.00	20.00	8.00	0
3	Northern	Kasama	Milungu west	Kanda Prudence	Chilemba	7	7	14	12	14	2.20	20.00	6.00	0
4	Northern	Kasama	Milungu west	Phillip Chitonguwa	Mwiika	20	14	34	34	34	2.00	20.00	5.00	0
5	Northern	Kasama	Selu	Phillip Chitonguwa	Chiinka	9	8	17	17	17	2.20	20.00	8.00	0
6	Northern	Kasama	Ngoli	Catherine Chileshe	Kakalamba	12	13	25	25	25	2.20	20.00	5.00	0
7	Northern	Kasama	Buaanda	Catherine Chileshe	Mumana Lupando	15	15	30	30	30	2.00	112.00	10.00	6
8	Northern	Kasama	Mulironge	Berra Viston	Olo IRR	20	14	34	34	34	3.00	3.50	8.00	0
9	Northern	Kasama	Milungu west	Jusina Khosa Banda	Cihilyacka2	8	4	12	15	12	3.00	40.00	8.00	0
10	Northern	Kasama	Milungu west	Jusina Khosa Banda	Chanda Mwamba	15	12	27	27	27	3.50	6.00	7.00	0
11	Northern	Kasama	Buaanda	Catherine Chileshe	Mukanga	9	5	14	30	14	3.00	10.00	1.50	0
12	Northern	Kasama	Mulanshi	Jusina Khosa Banda	Mualu	21	9	30	10	30	2.30	5.00	5.00	0
13	Northern	Kasama	Nkole Mfumu	Munalula Isaac	Nilole Mfumu	10	15	25	30	25	2.00	10.00	3.00	4
14	Northern	Kasama	Kasonde Cihisuna	Maini Clephashio	Chisuna	15	20	35	30	35	2.00	3.00	5.00	0
15	Northern	Kasama	Chiambo	Barbra Habmba	Kafukula	8	15	23	35	23	3.00	16.00	4.00	0
16	Northern	Kasama	Luna Lub	Jusina Khosa Banda	Itimbwe	20	14	34	26	34	4.00	12.00	8.00	0
17	Northern	Kasama	Naoli	Jusina Khosa Banda	Ktemfuma Kanono	11	4	15	26	15	0.80	5.00	8.00	0
18	Northern	Kasama	Naoli	Jusina Khosa Banda	Kaiemfuma Down	4	3	7	7	7	0.70	8.00	8.00	0
19	Northern	Kasama	Lukulu South	Vivian Sakala	Muwandga	10	15	25	25	25	0.50	1.00	2.00	0
20	Northern	Kasama	Lukulu South	Vivian Sakala	Mufwayeni	10	13	23	13	23	1.00	2.00	4.00	0
21	Northern	Kasama	Lukulu South	Vivian Sakala	Kamusih	15	13	28	20	28	1.50	4.00	0.00	0
22	Northern	Kasama	Munmba	Robert Ntembula	Ghanda Chamwamba	10	15	25	22	25	0.70	8.00	8.00	0
23	Northern	Kasama	Munmba	Robert Ntembula	Kalulu	16	10	26	26	26	1.00	12.00	8.00	0
24	Northern	Kasama	Munmba	Robert Ntembula	Mwafi	4	6	10	10	10	2.00	5.00	8.00	0
Kasama Total						293	286	579	546	579	47.60	362.50	141.50	10
25	Northern	Luwingu	DISTRICT	TSB officer	Masonde	10	11	21	10	10	0.30	1.90	0.20	0
26	Northern	Luwingu	DISTRICT	TSB officer	Masonde	20	13	33	21	13	0.25	1.10	0.18	0
27	Northern	Luwingu	Tungat 1	Bwembya Dhintu	Michelo	14	16	30	2	15	0.50	2.00	1.00	0
28	Northern	Luwingu	Tungat 1	Bwembya Dhintu	Fibulumo	6	6	12	4	6	0.60	3.00	1.00	0
29	Northern	Luwingu	Kapisha	Mnledga S.	Masonde South	14	16	30	7	15	0.30	1.00	0.50	0
30	Northern	Luwingu	Luena	Simfukwe Thomas	Mudeleka	10	10	20		10	0.30	0.00	0.00	0
31	Northern	Luwingu	Mnfil	Giles Bwalya	Kafuse	12	10	22	0	19	0.80	1.50	0.00	0
Luwingu Total						86	82	168	44	88	3.05	10.50	2.88	0

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						Male	Female	Total			Canal Length dug in 2014 (km)	Opend Area in 2014 (lima)	Actual irrigated Area in 2014 (A)	
32	Northern	Mbala	Mambwe	Monday Chintu	Kawezya	6	2	8	6	8	0.56	9.00	0.70	0
33	Northern	Mbala	Mambwe	Monday Chintu	Itwilusi	8	0	8	8	8	0.72	6.50	0.50	0
34	Northern	Mbala	Mambwe	Monday Chintu	Wangala	6	4	10	6	10	0.30	8.50	0.40	0
35	Northern	Mbala	Senga	Julius Mulenga	Chikoti	4	2	6	6	4	1.20	6.00	5.80	0
36	Northern	Mbala	Nondo	Eunice Chilongo	Reuben	30	10	40	30	15	0.50	2.00	2.00	1
37	Northern	Mbala	Nondo	Eunice Chilongo	Musafili	42	10	52	40	20	0.50	3.00	2.00	0
38	Northern	Mbala	Lunzuwa	Simposo Stepher	Isanya	43	52	95	23	10	1.30	0.00	4.00	0
39	Northern	Mbala	Masamba	Kaira Machua	Mwange	14	6	20	6	16	0.50	8.00	2.00	0
40	Northern	Mbala	Nsokolo	Lameck Lungu	Mwala	8	4	12	8	8	0.64	6.00	4.00	0
41	Northern	Mbala	Mambwe missiwe	Aaron Sichimata	Kaele	9	0	9	9	9	0.50	8.00	0.60	0
42	Northern	Mbala	Maule	Julius Mulenga	Membe	6	2	8	8	8	0.90	8.00	7.00	0
Mbala Total						176	92	268	150	116	7.62	65.00	29.00	1
43	Northern	Mporokoso	Chalabesa	Saidi Hussein	Mchembe	22	16	38	22	9	0.33	4.00	4.00	0
44	Northern	Mporokoso	S/Kapila	Brighton Mweemba	Nkalala	4	5	9	9	9	1.00	4.00	4.00	0
45	Northern	Mporokoso	Kapumo	Michelo M. Nyanga	Kapuh	10	5	15	15	15	2.50	2.00	6.00	0
46	Northern	Mporokoso	Mutotshi	H. Mulenga		9	3	12	17	12	2.50	2.00	0.75	0
47	Northern	Mporokoso	M/Mapesa	Erastus Siyunda		21	1	22	13	22	3.00	2.00	3.00	1
Mporokoso Total						66	30	96	76	67	9.33	14.00	17.75	1
48	Northern	Nsama	Munsele	James Simwinga	Matebe	15	5	20	10	20	0.10	2.00	1.00	0
49	Northern	Nsama	Munsele	James Simwinga	Kanwande 2	13	2	15	5	10	0.15	1.00	0.50	0
50	Northern	Nsama	Katele	James Simwinga	Kalolo 1	5	3	8	8	5	0.20	4.00	0.50	0
51	Northern	Nsama	Katele	James Simwinga	Kalolo 2	3	2	5	5	4	0.15	4.00	2.00	1
52	Northern	Nsama	Mundele	James Simwinga	Kananta 3	16	7	23	5	15	0.10	0.50	1.00	0
53	Northern	Nsama	Mukotkoe	Josprune P.	Mukothe 2	5	6	11	5	5	0.20	2.00	2.00	0
Nsama Total						57	25	82	38	59	0.90	13.50	7.00	1
54	Northern	Mungwi	Ngulula	Banda Brown	Kabulyeni	17	9	26	26	10	1.50	10.00	10.00	0
55	Northern	Mungwi	Ndasa	Banda Brown	Ndasa	13	6	19	19	5	0.50	2.00	8.00	0
56	Northern	Mungwi	Chamfubu	Beauty Chisanga	Chamfubu	100	25	125	0	25	2.00	0.00	0.00	0
57	Northern	Mungwi	Misamfu	Carol Mwanza	Twinga	40	12	52	35	15	4.50	16.00	12.00	0
58	Northern	Mungwi	Misamfu	Carol Mwanza	Kanyalupe	10	12	22	18	5	1.50	7.00	5.00	2
59	Northern	Mungwi	Chonya	Robert Chanda	Cinci wababili	15	5	20	8	6	0.50	2.00	2.00	0
60	Northern	Mungwi	Mungwi East	Judith Lombe	Kasokota	16	7	23	8	10	1.80	3.00	3.00	0
61	Northern	Mungwi	Kafusha	Gaspar Mulela	Sela	15	10	25	0	10	1.00	0.00	0.00	0
62	Northern	Mungwi	Chonya	Watson Banda	Mifutu	15	10	25	0	25	0.40	0.00	0.00	0
Mungwi Total						241	96	337	114	111	13.70	40.00	40.00	2
Northern Province						919	611	1,530	968	1,020	82.20	505.50	238.13	15
63	Muchinga	Isoka	Lualizi	Elano Sakala	Jasusi	15	5	20	20	10	0.20	4.00	4.00	0
64	Muchinga	Isoka	Lualizi	Elano Sakala	Caswa	8	4	12	12	10	0.20	4.00	4.00	0
65	Muchinga	Isoka	Kantenshya	Sampa Kanqowke	Namota	12	3	15	15	8	0.30	6.00	5.00	0
66	Muchinga	Isoka	Kantenshya	Sampa Kanqowke	Mukangala	20	5	25	25	12	0.60	12.00	10.00	3
Isoka Total						55	17	72	72	40	1.30	26.00	23.00	3

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						Male	Female	Total			Canal Length dug in 2014 (km)	Opend Area in 2014 (lima)	Actual irrigated Area in 2014 (A)	
67	Muchinga	Mpika	Chishibesonde	Nlupya Estella	Chitompe	11	12	23	10	10	1.10	5.50	3.00	0
68	Muchinga	Mpika	Chishibesonde	Nlupya Estella	Mapungu	8	6	14	6	7	0.50	1.00	1.00	0
69	Muchinga	Mpika	Chishibesonde	Nlupya Estella	Fisonge. C	9	7	16	6	6	0.50	1.00	2.00	0
70	Muchinga	Mpika	Chintu	Ksonde Jenipher	Musanya	11	4	15	10	15	1.00	2.00	10.00	0
71	Muchinga	Mpika	Katibunga	Shakalima Kenny		0	0	0	0	0	0.00	0.00	0.00	0
72	Muchinga	Mpika	Lufila	Mutale Jeff	Mnomambulwa	7	8	15	2	9	0.90	1.25	1.25	0
73	Muchinga	Mpika	Lufila	Mutale Jeff	Chimbwa	7	4	11	0	5	0.75	0.75	0.63	1
74	Muchinga	Mpika			Kulamwela	6	6	12		5	0.10	0.00	0.00	0
Mpika Total						59	47	106	34	57	4.85	11.50	17.88	1
75	Muchinga	Nakonde	Ilola	Sailas Mwansa	Kaku	22	25	47	15	12	0.50	2.00	1.50	0
76	Muchinga	Nakonde	Ilola	Sailas Mwansa	Mumezye	13	11	24	8	9	0.75	1.50	1.00	0
77	Muchinga	Nakonde	Katwachi	Hambwaza Choolwe	Nankulgulu	10	4	14	4	7	0.50	4.00	2.00	0
78	Muchinga	Nakonde	Ilola	Mwansa Sailus	Yalmanga	23	5	28	23	19	0.75	1.50	1.00	0
79	Muchinga	Nakonde	Ilola	Mwansa Sailus	Kapiwila	15	17	32	24	17	0.50	1.50	1.00	0
80	Muchinga	Nakonde	Chanka	Teddy Simbowe	Kalungu	9	12	21	5	7	0.75	2.00	1.00	0
81	Muchinga	Nakonde	Kalungu	Patrical Singogo	Chipwililo B	19	17	36	20	15	1.00	3.00	1.50	0
82	Muchinga	Nakonde	Shemu	Ethel Chanda	Nyela	21	7	28	17	12	0.60	2.50	1.00	0
83	Muchinga	Nakonde	Old Fife	Mwamba Martin	Ntindi	10	3	13	5	4	0.35	1.00	0.50	0
Nakonde Total						142	101	243	121	102	5.70	19.00	10.50	0
84	Muchinga	Shiwangandu	Chasosa	Brian Sazombo	Kabundi	8	10	18	4	10	0.40	4.00	1.00	1
85	Muchinga	Shiwangandu	Lwanya	Mambwe Joackim	Itulo	6	4	10	3	6	0.10	3.00	0.42	0
Shiwangandu Total						14	14	28	7	16	0.50	7.00	1.42	1
Muchinga Province						270	179	449	234	215	12.35	63.50	52.80	5
86	Luapula	Mansa	Mwangoni	Mubita E	Chilikwa	7	1	8	30	6	1.00	2.00	1.00	0
87	Luapula	Mansa	Chifula	Micheal Nondo	Katuku	12	7	19	1	19	6.10	2.00	1.00	0
88	Luapula	Mansa	Kapyata	Melody Shakamba	Sepe	17	7	24	3	12	1.80	1.50	0.33	0
89	Luapula	Mansa	Mutiti	Ruth Chuyayika	Myengele	15	10	25	25	10	0.07	2.00	2.00	0
90	Luapula	Mansa			Chibeka	4	11	15	0	7	0.10		0.00	0
91	Luapula	Mansa			Chola	5	0	5	0	1	0.15		1.00	0
92	Luapula	Mansa	Kapyata	Melody Shakamba	Twafwane	11	5	16	16	11	0.40	1.00	2.00	0
93	Luapula	Mansa			Chileka	9	1	10	8	6	0.00	2.00	1.00	0
Mansa Total						80	42	122	83	72	9.62	10.50	8.33	0
94	Luapula	Chembe	Luwo	Jenet	Kasanga	10	8	18	15	12	1.66	4.00	2.50	0
95	Luapula	Chembe	Kundamfumu	Agness	Chikush	12	7	19	17	15	2.00	6.00	3.00	0
96	Luapula	Chembe	Luwo	Jenet	Happy	10	5	15	12	11	2.50	8.00	4.00	0
Chembe Total						32	20	52	44	38	6.16	18.00	9.50	0
97	Luapula	Mwense	Munwa	Mpambwe Kawama	Buyantanshi	18	20	38	14	38	1.00	0.00	12.00	0
98	Luapula	Mwense	Mubende	Bwalya Mukupa	Aron/ Loto	12	17	29	4	11		0.00	3.00	0
99	Luapula	Mwense	Mwense central	Kananda Christine	Bwele	15	10	25	24	13	0.40	12.00	8.00	0
100	Luapula	Mwense	Mwense central	Kananda Christine	Fiteba	9	7	16	14	9	0.30	0.80	0.60	0
101	Luapula	Mwense	Kashiba	TSB officer	Chimbili	23	11	34	6	20	1.00	1.00	1.00	0
Mwense Total						77	65	142	62	91	2.70	13.80	24.60	0

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Achievement (New Sites)

No.	Province	District	Camp Name	Name of the BEO/CEO	SiteName	No. of member farmers			No. of farmers already irrigating	No. of member Household	Done in This Dry Season(2014)			No. of Fish Pond made using COBSI irrigation
						Male	Female	Total			Canal Length dug in 2014 (km)	Open Area in 2014 (lima)	Actual irrigated Area in 2014 (A)	
102	Luapula	Chipili	Chipili	Dickson Nguni	Kankalamu	12	24	36	0	36	1.00			
Chipili Total						12	24	36	0	36	1.00	0.00	0.00	0
103	Luapula	Kawambwa	Folotiya	Mukosa Aaron	Akalamba	5	3	8	0	5	0.20	0.25	0.75	0
104	Luapula	Kawambwa	Lusambo	Chilambwe Micheal	Chansamalamba	7	2	9	0	9	0.40	0.50	0.50	0
105	Luapula	Kawambwa	Lusambo	Chilambwe Micheal	Chansamalamba Musangulu	26	19	45	15	7	0.25	0.00	0.38	0
106	Luapula	Kawambwa	Munkanta	Banda Winstone	Bubenshi 2	25	35	60	0	25	0.25	0.00	0.25	0
KawabMansa Total						63	59	122	15	46	1.10	0.75	1.88	0
107	Luapula	Mwansa Bombwe	Chilange	Douglas Kafula	Kapweshi	18	12	30	26	13	1.00	16.00	8.00	4
108	Luapula	Mwansa Bombwe	Mbereshi	Kelvin Muyelu	Chilindi	5	5	10	10	4	1.50	2.00	1.00	0
109	Luapula	Mwansa Bombwe	Kapesa	Sakala Pearson	Kansenda	16	28	44	21	12	0.15	12.00	8.00	0
110	Luapula	Mwansa Bombwe	Mumbolo	Happy Lamba	Shimumbolo	16	21	37	28	18	0.60	4.00	3.50	2
111	Luapula	Mwansa Bombwe	Lufubu	Chongo Prince	Chituta	19	15	34	12	11	0.90	24.00	12.00	0
112	Luapula	Mwansa Bombwe	Lufubu	Chongo Prince	Kafuma	5	5	10	12	10	1.70	8.00	4.00	0
Mwansabombwe Total						79	86	165	109	68	5.85	66.00	36.50	6
113	Luapula	Nchelenge	Kabuta	Alex Sichula		8	22	30	0	12	0.40	3.00	1.50	0
114	Luapula	Nchelenge	Mulanga	Donald Simpanda	Kasamba	4	2	6	3	6	0.20	1.00	1.00	0
Nchelenge Total						12	24	36	3	18	0.60	4.00	2.50	0
115	Luapula	Milenge	Mupita	Mwanda. B	Kalali	25	15	40	12	18	0.15	1.00	0.00	4
116	Luapula	Milenge	Mulumbi	Mazunda. C .M	Lukulashi	17	8	25	5	12	0.20	2.00	1.00	0
117	Luapula	Milenge	Kabange	Kango Gracious	Ngoyi	13	7	20	8	11	0.25	2.50	2.00	2
118	Luapula	Milenge	Ngomba	Banda Lackson	Ngomba	8	7	15	5	8	0.10	2.00	1.00	0
119	Luapula	Milenge	Stambuli	Kopa William	Lunuka	11	7	18	6	13	0.20	2.00	1.50	1
120	Luapula	Milenge	Kapalala	Mukuma .B	Kapalala	9	7	16	5	10	0.10	1.50	1.00	1
121	Luapula	Milenge	Mulambo	Sinkala Elliah	Itemba	6	5	11	4	6	0.08	1.00	0.50	0
Milenge Total						89	56	145	45	78	1.08	12.00	7.00	8
Luapula Province						444	376	820	361	447	28.11	125.05	90.31	14
3 Provines						1,633	1,166	2,799	1,563	1,682	122.66	694.05	381.23	34

Monitoring Sheet for Simple Weir Schemes Constructed in 2015 (As of End of October, 2015)

Achievement (New Sites and Improvement Sites)

Year	Type	Province	District	Site No.	Camp Name	Name of the BEO/ CEO	Category of Officer	Site Name	Date Weir is Improved	No. of member Household	No. of member farmers			Weir Type ²	Canal Length (km)	Original + Newly Irrigated Area (Ilima)	No of Fish Pond
											Male	Female	Total				
2015	New	Northern	KASAMA	4	Kapanda	Bwalya Mulenga	Main	Nsaje	23-Jul	15	12	3	15	2	0.6	2.0	4
2015	New	Northern	KASAMA	5	Kapanda	Bwalya Mulenga	Main	Kakoko	22-Jul	22	8	14	22	1	0.3	1.0	1
2015	New	Northern	KASAMA	6	Kapanda	Bwalya Mulenga	Main	Twikatan e	12-Aug	21	13	8	21	2	0.4	1.5	0
2015	New	Northern	KASAMA	7	Kapanda	Bwalya Mulenga	Main	Malanda	27-Oct	16	9	7	16	0	0.5	0.3	0
2015	New	Northern	KASAMA	8	Kapanda	Bwalya Mulenga	Main	Musanda	7-Jul	23	12	11	23	5	1.5	4.0	3
2015	New	Northern	KASAMA	9	Bulanda	Prekeria Mbewe	Main	Mumana Lupando	5-Aug	25	10	15	25	1	1.0	1.0	0
2015	New	Northern	KASAMA	10	Bulanda	Prekeria Mbewe	Main	Mubanga Lupiya	10-Aug	30	22	8	30	1	0.5	1.5	0
2015	New	Northern	KASAMA	11	Bulanda	Prekeria Mbewe	Main	Kaleya	12-Aug	20	11	9	20	1	1.5	2.0	0
2015	New	Northern	KASAMA	12	Mulanshi	Jeremiah Banda	Main	Luashya	20-Jun	35	15	20	35	2	1.5	3.5	0
2015	New	Northern	KASAMA	13	Mulanshi	Jeremiah Banda	Main	Lubusha	15-Jul	21	14	7	21	2	1.0	2.5	0
2015	New	Northern	KASAMA	14	Mulanshi	Phillip Chitongwa	TSB	Milundo	25-Jun	11	7	4	11	3	4.8	5.0	0
	New		KASAMA Total							239	133	106	239	20	13.57	24.25	8
2015	IMP	Northern	KASAMA	4	Milungu East	Andrew Nyirenda	Main	Mathew Mbulo	15-Sep	20	11	9	20	1	2.00	1.0	0
2015	IMP	Northern	KASAMA	5	Milungu East	Catherine Chileshe	TSB	Sume	13-Jul	25	12	13	25	3	3.00	1.5	0
2015	IMP	Northern	KASAMA	6	Mulanshi	Jeremiah Banda	Main	Mabula	23-Jun	16	7	9	16	1	3.50	7.0	10
2015	IMP	Northern	KASAMA	7	Mulanshi	Jeremiah Banda	Main	Lyoki	10-Jul								
2015	IMP	Northern	KASAMA	81	Kafwimbi	Francis Bwalya	TSB	Chimbala	11-Jun	12	9	3	12	1	2.30	12.00	0
	IMP		KASAMA Total							73	39	34	73	6	10.80	21.50	10
2015	New	Northern	LUWINGU	29	Luena	Matildah Nachona	Fellow	Mupeleka 1	10-Sep	18	18	18	36	2	1.5	3.0	0
2015	New	Northern	LUWINGU	30	Luena	Matildah Nachona	Fellow	Mupeleka 2	16-Jun	14	14	14	28	2	1.2	3.0	2
2015	New	Northern	LUWINGU	31	Katuta	Moonga Sibusenga	Main	Kashe	29-Jul	28	36	16	52	2	0.5	1.5	0
2015	New	Northern	LUWINGU	32	Katuta	Moonga Sibusenga	Main	Chishiba	6-Sep	11	18	8	26	2	0.5	1.0	0
2015	New	Northern	LUWINGU	33	Kapisha	Mulenga Henry	Main	Chishishe	6-Aug	15	15	10	25	3	0.6	1.5	0
2015	New	Northern	LUWINGU	34	Shimumbi	Simfukwe Thomas	Main	Mufubushi	7-Jun	27	27	30	57	3	1.5	1.0	0
2015	New	Northern	LUWINGU	35	Mufili	TSB (LWG)	TSB	Milandu Chibele	11-Aug	14	10	5	15	3	0.5	0.3	0
2015	New	Northern	LUWINGU	36	Mufili	TSB (LWG)	TSB	Chinyanga	14-May	12	11	5	16	3	0.7	0.3	0
2015	New	Northern	LUWINGU	37	Mufili	TSB (LWG)	TSB	Chitamba	16-Jul	10	11	6	17	3	0.2	0.5	0
	New		LUWINGU Total							149	160	112	272	23	7.15	12.00	2
2015	IMP	Northern	LUWINGU	25	Luena	Matildah Nachona	Fellow	Mupeleka	4-Jun	10	10	18	28	2	0.70	1.00	0
2015	IMP	Northern	LUWINGU	26	Kaatuta	Moonga Sibusenga	Main	Kaluba	11-Aug	21	15	20	35	2	1.00	1.00	0
2015	IMP	Northern	LUWINGU	27	Mfungwe	Brian Njovu	Main	Chishishe	6-Jul	31	16	22	38	2	0.50	0.80	0
	IMP		LUWINGU Total							62	41	60	101	6	2.20	2.80	0
2015	New	Northern	MBALA	15	Luchele	Memory Chisha	Main	Chiyanga	7-Jun	25	18	11	29	1	1.0	3.0	0
2015	New	Northern	MBALA	16	Luchele	Memory Chisha	Main	Kati	22-Jun	20	15	9	24	2	1.2	2.0	0
2015	New	Northern	MBALA	17	Lunzua	Farai Chigowe	Main	Chisa	4-Jun	25	18	14	32	1	2.0	3.5	0
2015	New	Northern	MBALA	18	Lunzua	Farai Chigowe	Main	Saise	29-Jun	17	15	12	27	1	1.5	4.0	0
2015	New	Northern	MBALA	19	Masamba	Bruno Mubanga	Main	Musisha	24-Jul	22	16	9	25	2	2.0	2.0	0
2015	New	Northern	MBALA	20	Masamba	Bruno Mubanga	Main	Kalwanga	8-Jul	15	12	7	19	2	1.9	3.0	0
2015	New	Northern	MBALA	21	Kawimbe	Cliff Kafula	Main	Kawama	11-Aug	18	14	8	22	2	2.0	2.0	0
2015	New	Northern	MBALA	22	Kawimbe	Cliff Kafula	Main	Lumi	27-Jun	17	15	5	20	1	1.0	1.5	0
2015	New	Northern	MBALA	23	Distrfict	Machua Kaira	TSB	Saise East	8-Jul	30	26	14	40	2	1.8	6.0	0
2015	New	Northern	MBALA	24	Distrfict	Machua Kaira	TSB	Kasulo	27-Aug	19	15	6	21	2	1.4	2.0	0
2015	New	Northern	MBALA	25	Distrfict	Annie Nyirongo	TSB	Mutwizi	28-Jul	15	13	9	22	2	1.2	3.0	0
2015	New	Northern	MBALA	26	Chindo	Chrispine Chirwa	Main	Chitusa	2-Jul	24	18	12	30	2	0.8	2.0	0
2015	New	Northern	MBALA	27	Chindo	Chrispine Chirwa	Main	Kapunda	6-Aug	20	19	14	33	1	0.9	1.0	0
2015	New	Northern	MBALA	28	Chindo	Chrispine Chirwa	Main	Misuku	28-Aug	27	30	12	42	2	1.0	2.0	0
	NEW		MBALA Total							294	244	142	386	22.9	19.70	37.00	0

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Year	Type	Province	District	Site No.	Camp Name	Name of the BEO/ CEO	Category of Officer	Site Name	Date Weir is Improved	No. of member Household	No. of member farmers			Weir Type ²	Canal Length (km)	Original + Newly Irrigated Area (Hima)	No of Fish Pond
											Male	Female	Total				
2015	IMP	Northern	MBALA	8	Lucheche	Memory Chisha	Main	Chilatila	10-Jul	15	16	9	25	5	2.20	8.0	4
2015	IMP	Northern	MBALA	9	Lucheche	Memory Chisha	Main	Mwambezi	30-Jun	20	15	10	25	1	3.00	8.0	3
2015	IMP	Northern	MBALA	10	Lucheche	Memory Chisha	Main	Isanya	7-Sep	25	11	6	17	2	3.00	9.5	2
2015	IMP	Northern	MBALA	11	Lunzua	Farai Chigowe	Main	Ntulo	5-Aug	20	17	12	29	2	4.00	9.50	9
2015	IMP	Northern	MBALA	12	Lunzua	Farai Chigowe	Main	Ntenda Central	29-Sep	14	10	5	15	2	4.80	7.00	6
2015	IMP	Northern	MBALA	13	Lunzua	Farai Chigowe	Main	Kakonde	11-Aug	21	17	11	28	2	3.80	8.80	11
2015	IMP	Northern	MBALA	14	Masamba	Bruno Mubanga	Main	Chindo	7-Jul	15	14	4	18	2	2.80	4.00	0
2015	IMP	Northern	MBALA	15	Masamba	Bruno Mubanga	Main	Kalamanza	15-Aug	22	16	7	23	2	3.40	7.00	0
2015	IMP	Northern	MBALA	16	Masamba	Bruno Mubanga	Main	Chingombe	28-Jul	26	17	9	26	2	3.40	7.50	0
2015	IMP	Northern	MBALA	17	Kawimbe	Cliff Kafula	Main	Mpamba	5-Jul	29	19	11	30	2	3.50	10.00	0
2015	IMP	Northern	MBALA	18	Kawimbe	Cliff Kafula	Main	Mulalo	17-Aug	27	15	8	23	2	3.40	6.00	9
2015	IMP	Northern	MBALA	19	Kawimbe	Cliff Kafula	Main	Mwandwizi	6-Aug	15	9	5	14	2	3.20	5.20	0
2015	IMP	Northern	MBALA	20	District	Annie Nyirongo	TSB	Mwanakatwe	8-Jul	30	18	15	33	3	4.10	9.00	0
2015	IMP	Northern	MBALA	21	District	Annie Nyirongo	TSB	Muzwai	20-Jul	19	15	11	26	2	2.50	7.00	0
2015	IMP	Northern	MBALA	22	District	Annie Nyirongo	TSB	Ntenda East	2-Aug	15	12	7	19	2	4.50	6.50	0
2015	IMP	Northern	MBALA	23	Chindo	Chrispine Chirwa	Main	Manzi	4-Sep	17	14	8	22	1	3.40	3.00	0
2015	IMP	Northern	MBALA	24	Chindo	Chrispine Chirwa	Main	Chindo	10-Oct	29	17	13	30	1	1.90	3.00	0
	IMP		MBALA Total							359	252	151	403	35	56.90	119.00	44
2015	New	Northern	MPOROKOSO	60	Mpalapata	Gift Malumo	Main	Bundesha	Jul	9	11	5	16	2	1.3	3.0	0
2015	New	Northern	MPOROKOSO	61	Kambobe	Chipeta.K.	Main	Kambobe	1-Sep	5	5	7	12	1	0.5	2.0	0
2015	New	Northern	MPOROKOSO	62	Kambobe	Chipeta.K.	Main	Kopeka	4-Sep	7	8	10	18	1	1.0	3.0	4
2015	New	Northern	MPOROKOSO	63	Katutwa	Nakamba K.	Main	Kabwe Changala	30-Oct	35	71	139	210	3	0.4	0.5	0
2015	New	Northern	MPOROKOSO	64	Moseni	Chisanga.B.	Main	Kashingishi	24-Jun	15	15	4	19	2	1.0	2.0	1
2015	New	Northern	MPOROKOSO	65	Moseni	Chisanga.B.	Main	Pamba	28-Jul	17	26	8	34	1	0.5	0.0	0
2015	New	Northern	MPOROKOSO	66	Moseni	Chisanga.B.	Main	Maute	23-Jul	16	16	14	30	1	1.8	1.5	0
2015	New	Northern	MPOROKOSO	67	Moseni	Chisanga.B.	Main	Ming'omba	16-Jul	23	35	35	70	3	0.6	0.0	0
2015	New	Northern	MPOROKOSO	68	Moseni	Chisanga.B.	Main	Matipa	7-Aug	21	43	33	76	1	0.5	0.5	0
2015	New	Northern	MPOROKOSO	69	Moseni	Chisanga.B.	Main	Kanyambi	12-Sep	18	12	14	26	3	1.0	1.5	0
2015	New	Northern	MPOROKOSO	70	Moseni	Chisanga.B.	Main	Twabuke	3-Oct	12	8	10	18	1	0.3	0.5	0
2015	New	Northern	MPOROKOSO	71	Moseni	Chisanga.B.	Main	Malonge	13-Oct	20	13	10	23	3	0.5	1.5	0
2015	New	Northern	MPOROKOSO	72	District	Chininga.C.	TSB	Mipa	4-Jul	8	11	8	19	2	0.3	0.3	0
	New		MPOROKOSO Total							206	274	297	571	24	9.65	16.25	5
2015	IMP	Northern	MPOROKOSO	54	Mpalapata	Gift Malumo	Main	Kachikashi	3-Jul	8	8	2	10	2	1.75	5.50	2
2015	IMP	Northern	MPOROKOSO	55	Mpalapata	Gift Malumo	Main	Mukumba	12-Aug	4	5	3	8	0	1.20	4.00	3
2015	IMP	Northern	MPOROKOSO	56	Mpalapata	Gift Malumo	Main	Fitungulu	25-Sep	11	13	8	21	2	1.40	4.00	3
2015	IMP	Northern	MPOROKOSO	57	Kambobe	Chipeta.K.	Main	Kampanda	17-Jun	4	6	4	10	1	0.50	2.00	2
2015	IMP	Northern	MPOROKOSO	58	Kambobe	Chipeta.K.	Main	Kapanda	7-Aug	3	4	3	7	1	0.64	1.50	0
2015	IMP	Northern	MPOROKOSO	59	Kambobe	Chipeta.K.	Main	Lukonko	12-Oct	3	3	2	5	2	1.24	7.00	0
2015	IMP	Northern	MPOROKOSO	60	Kambobe	Chipeta.K.	Main	Chilando	9-Oct	4	6	4	10	1	0.75	2.50	0
2015	IMP	Northern	MPOROKOSO	61	Katutwa	Nakamba K.	Main	Nshindano	7-Jul	70	94	28	122	3	5.00	3.00	0
2015	IMP	Northern	MPOROKOSO	62	Katutwa	Nakamba K.	Main	Machango	11-Sep	75	35	14	49	3	4.00	3.00	0
2015	IMP	Northern	MPOROKOSO	63	Katutwa	Nakamba K.	Main	Mwita	14-Oct	35	100	21	121	2	10.00	4.00	1
2015	IMP	Northern	MPOROKOSO	64	Moseni	Chisanga.B.	Main	Monta	10-Jul	33	28	56	84	5	4.80	3.50	28
2015	IMP	Northern	MPOROKOSO	65	Moseni	Chisanga.B.	Main	Twampane	5-Aug	12	18	14	32	4	3.40	2.00	6
2015	IMP	Northern	MPOROKOSO	66	Moseni	Chisanga.B.	Main	Ninga	22-Sep	17	14	9	23	2	3.40	3.50	1
2015	IMP	Northern	MPOROKOSO	67	District	Chininga.C.	TSB	Mushutu	9-Sep	21	38	11	49	2	0.80	2.50	2
2015	IMP	Northern	MPOROKOSO	68	District	Chininga.C.	TSB	Kapanda	26-Sep	14	24	16	40	2	1.00	4.00	0
2015	IMP	Northern	MPOROKOSO	69	District	Chininga.C.	TSB	Lupungu	13-Oct	16	32	18	50	3	1.50	4.25	0
	IMP		MPOROKOSO Total							330	428	213	641	35	41.38	56.25	48

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Year	Type	Province	District	Site No.	Camp Name	Name of the BEO/ CEO	Category of Officer	Site Name	Date Weir is Improved	No. of member Household	No. of member farmers			Weir Type ²	Canal Length (km)	Original + Newly Irrigated Area (Hm ²)	No of Fish pond
											Male	Female	Total				
2015	New	Northern	MUNGWI	52	Chimbola	Mapopa Tembo	Main	Nsunka	25-Jun	45	70	30	100	2	0.8	1.5	0
2015	New	Northern	MUNGWI	53	Chimbola	Mapopa Tembo	Main	Kampangala	14-Jul	30	53	19	72	2	0.5	0.0	0
2015	New	Northern	MUNGWI	54	Chimbola	Mapopa Tembo	Main	Chitawa	19-Oct	26	28	12	40	2	0.5	0.5	0
2015	New	Northern	MUNGWI	55	Ngulula	Aroster Chilla	Main	Twalubuka Katilungu	22-Sep	17	18	13	31	1	0.8	4.1	0
2015	New	Northern	MUNGWI	56	Makasa	Cornerious Chibale	Main	Kandwindwi	7-Jul	18	11	14	25	1	0.5	0.0	0
	New		MUNGWI Total							136	180	88	268	8	3.10	6.10	0
2015	IMP	Northern	MUNGWI	44	Mungwi East	Judith Lombe	Main	Twikatane	10-Jul	20	12	13	25	1	4.00	25.00	3
2015	IMP	Northern	MUNGWI	45	Chimbola	Mapopa Tembo	Main	Chisekelele	27-Jul	10	13	12	25	2	0.50	6.00	0
2015	IMP	Northern	MUNGWI	46	Ngulula	Aroster Chilla	Main	Kanyalupe2	8-Aug	17	21	13	34	1	4.80	13.80	4
2015	IMP	Northern	MUNGWI	47	Malole South	TSB (MGW)	TSB	Mutamba2	15-Oct	29	30	40	70	1	4.50	16.00	4
2015	IMP	Northern	MUNGWI	48	Makasa	Cornerious Chibale	Main	Munyangala	16-Jul	20	19	15	34	2	2.00	1.75	2
2015	IMP	Northern	MUNGWI	49	Makasa	Cornerious Chibale	Main	Kala	8-Oct	8	7	4	11	1	1.00	0.25	0
2015	IMP	Northern	MUNGWI	50	Rosa	Chiza Mubeteka	Fellow	Isondwa	1-Oct	20	18	10	28	2	3.20	3.50	0
	IMP		MUNGWI Total							124	120	107	227	10	20.00	66.30	13
2015	New	Northern	NSAMA	39	Mukotwe	Annie Nakamba	Main	Chilulu	Aug	7	5	5	10	2	0.5	2.0	0
2015	New	Northern	NSAMA	40	Mukotwe	Annie Nakamba	Main	Mukotwe2	Aug	5	5	4	9	1	0.5	2.0	0
2015	New	Northern	NSAMA	41	Mukotwe	Annie Nakamba	Main	Mukotwe3	7-Jul	7	10	5	15	2	0.5	0.5	3
2015	New	Northern	NSAMA	42	Kananda	Annie Nakamba	Main	Aug	6-Aug	15	10	7	17	1	0.5	0.5	0
2015	New	Northern	NSAMA	43	Mukotwe	Mulise.C.	Fellow	Kalolo	1-Jul	5	6	6	12	1	0.5	0.5	1
2015	New	Northern	NSAMA	80	Munyele1	James Simwinga	Fellow	Kalolo	1-Jul	5	6	6	12	1	0.5	2.0	1
2015	New	Northern	NSAMA	81	Mukotwe3	Annie Nakamba	Main	Mukotwe3	7-Jul	7	10	5	15	2	0.5	2.0	0
2015	New	Northern	NSAMA	82	Munyele	James Simwinga	Fellow	Kananda3	8-Aug	15	16	7	23	1	0.5	2.0	0
	New		NSAMA Total							66	68	45	113	11	4.00	11.50	5
2015	IMP	Northern	NSAMA	34	Katele	Chinza	Main	Katele	Aug	6	5	3	8	1	2.50	3.00	0
2015	IMP	Northern	NSAMA	35	Katele	Chinza	Main	Kalolo2	Aug	5	4	3	7	2	1.00	2.00	0
2015	IMP	Northern	NSAMA	36	TSB	Mulise.C.	Fellow	Matete	Aug	20	15	5	20	1	0.35	1.00	0
2015	IMP	Northern	NSAMA	37	Munyele	Mulise.C.	Fellow	Kananda	Aug	21	17	5	22	2	0.50	2.00	0
2015	IMP	Northern	NSAMA	38	Mukotwe	Annie Nakamba	Main	Kambakwe	Aug	10	25	5	30	1	1.00	4.00	0
2015	IMP	Northern	NSAMA	39	Mukotwe	Annie Nakamba	Main	Mukotwe	Jul	5	6	6	12	2	0.80	2.00	1
2015	IMP	Northern	NSAMA	75	Munyele	James Simwinga	Fellow	Kalolo	1-Jul	5	6	6	12	2	0.80	2.00	1
2015	IMP	Northern	NSAMA	76	Mukotwe	Annie Nakamba	Main	Mukotwe2	Aug	6	5	3	8	1	1.00	3.00	0
2015	IMP	Northern	NSAMA	77	Munyele	James Simwinga	Fellow	Matete	Aug	20	15	5	20	1	0.35	1.30	0
	IMP		NSAMA Total							98	98	41	139	13	8.30	20.30	2
	New		Northern P. Total							1,090	1,059	790	1,849	109	57.17	107.10	20
	IMP		Northern P. Total							1,046	978	606	1,584	105	139.58	286.15	117

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											Male	Female	Total				
2015	New	Luapula	MANSA	90	Chibalashi	Taza Zulu	Main	Mulundu	23-Jul	10	36	12	48	0	18.0	0.1	0
2015	New	Luapula	MANSA	91	Mano	Mike Silume	Main	Mashinda	24-Jun	11	16	4	20	3	0.3	2.1	0
2015	New	Luapula	MANSA	92	Mano	Mike Silume	Main	Kabengele	9-Jul	15	21	3	24	3	0.1	0.0	0
2015	New	Luapula	MANSA	93	Ntoposhi	Raphael Matipa	Main	Kansoka1	23-Jun	8	11	0	11	3	0.2	1.5	1
2015	New	Luapula	MANSA	94	Ntoposhi	Raphael Matipa	Main	Kansoka2	10-Jul	5	5	2	7	3	0.2	2.5	0
	New		MANSA Total							49	89	21	110	12.4	18.74	6.15	1
2015	IMP	Luapula	MANSA	88	Chibalashi	Taza Zulu	Main	Nsange	22-Jun	8	8	4	12	3	0.50	4.25	0
2015	IMP	Luapula	MANSA	89	Ntoposhi	Raphael Matipa	Main	Twikatane Riverside	19-Sep	7	7	3	10	2	0.25	2.00	0
2015	IMP	Luapula	MANSA	90	Ntoposhi	Raphael Matipa	Main	Munweumo	22-Oct	6	6	3	9	2	0.20	2.00	0
	IMP		MANSA Total							21	21	10	31	7	0.95	8.25	0
2015	New	Luapula	MILENGE	139	Kabange	Lackson Banda	Main	Matontola	6-Jul	9	10	6	16	2	0.5	1.0	0
2015	New	Luapula	MILENGE	140	Kabange	Lackson Banda	Main	Mibembo	15-Jul	15	15	10	25	2	0.8	3.0	0
2015	New	Luapula	MILENGE	141	Kafwanka	Mandala Hara	Main	Kamwango	16-Aug	7	9	5	14	2	0.2	2.0	0
2015	New	Luapula	MILENGE	142	Kafwanka	Mandaia Hara	Main	Akampungulu	19-Sep	10	15	9	24	2	0.20	0.00	0
	New		MILENGE Total							41	49	30	79	8	1.65	6.00	0
2015	IMP	Luapula	MILENGE	122	Kabange	Lackson Banda	Main	Chiswishi	25-Jul	15	11	14	25	5	4.00	4.50	1
2015	IMP	Luapula	MILENGE	123	Kabange	Lackson Banda	Main	Chiswishi	19-Aug	7	6	6	12	5	3.50	2.75	0
2015	IMP	Luapula	MILENGE	124	Kabange	Lackson Banda	Main	Chiswishi	27-Aug	8	8	6	14	5	2.70	2.25	1
	IMP		MILENGE Total							30	25	26	51	15	10.20	9.50	2
2015	New	Luapula	MWANSABOMBWE	125	Chillange	Douglas Kafula	Main	Kapweshi2	28-May	16	30	15	45	2	4.5	10.0	4
2015	New	Luapula	MWANSABOMBWE	126	Chillange	Douglas Kafula	Main	Sebo	11-Jun	9	24	6	30	4	1.0	5.0	1
2015	New	Luapula	MWANSABOMBWE	127	Chillange	Douglas Kafula	Main	Esther	17-Jul	10	18	7	25	2	0.5	1.5	2
2015	New	Luapula	MWANSABOMBWE	128	Kayo	Cryton Simbaya	Main	Kasenga	4-Aug	25	36	25	61	2	0.5	5.0	0
2015	New	Luapula	MWANSABOMBWE	129	Kayo	Cryton Simbaya	Main	Kambikambi	12-Jun	3	7	5	12	2	0.2	0.8	0
2015	New	Luapula	MWANSABOMBWE	130	Kabalange	Millo Sichila	Main	Mufuta	23-Jul	6	5	6	11	2	0.9	1.0	0
2015	New	Luapula	MWANSABOMBWE	131	Kayo	Kangwa Joseph	Fellow	Kayo	8-Jul	3	7	5	12	2	0.2	1.8	0
2015	New	Luapula	MWANSABOMBWE	132	Lufubu	Lostone Mwelwa	TSB	Chitipa	22-Aug	16	22	11	33	1	0.5	1.50	2
	New		MWANSABOMBWE Total							88	149	80	229	17	8.20	26.50	9
2015	IMP	Luapula	MWANSABOMBWE	111	Chillange	Douglas Kafula	Main	Kapweshi	19-Jul								
2015	IMP	Luapula	MWANSABOMBWE	112	Lufubu	Chongo Prince	Main	Kafuma	10-Aug	25	7	5	12	2	2.40	8.50	0
2015	IMP	Luapula	MWANSABOMBWE	113	Mumbolo	Happy Lamba	Fellow	Shimumbolo	24-Aug	18	6	12	18	2	1.20	1.60	0
	IMP		MWANSABOMBWE Total							43	13	17	30	4	3.60	10.10	0
2015	New	Luapula	MWENSE	108	TSB Officer	D. Chikwekwe	TSB	Kasengu	24-Jul	21	15	23	38	4	1.0	1.0	0
2015	New	Luapula	MWENSE	109	TSB Officer	D. Chikwekwe	TSB	Chifokotola	Jul	8	6	8	14	1	1.0	2.0	0
2015	New	Luapula	MWENSE	110	Kankomba	H. Kalobwe	Main	Kamisashi	7-Jul	11	11	9	20	1	0.3	2.0	0
2015	New	Luapula	MWENSE	111	Kankomba	H. Kalobwe	Main	Ombela	15-Jul	13	4	14	18	1	2.0	1.0	0
2015	New	Luapula	MWENSE	112	TSB Officer	L. Mukwanje	TSB	Kote	Jul	16	12	8	20	1	0.4	1.0	0
2015	New	Luapula	MWENSE	113	Kashiba	L. Witika	Main	Natubalange	9-Jul	20	19	20	39	2	0.3	1.0	0
2015	New	Luapula	MWENSE	114	Kashiba	L. Witika	Main	Shimulonga	1-Jul	10	12	13	25	2	0.2	1.0	0
2015	New	Luapula	MWENSE	115	Kashiba	L. Witika	Main	Muyomba	3-Aug	5	6	0	6	2	0.2	2.0	0
2015	New	Luapula	MWENSE	116	Lukwesa	A. Katongo	Main	Kakumbi	2-Jul	4	6	3	9	4	3.4	2.0	0
2015	New	Luapula	MWENSE	117	Katuta	M. Chungu	Main	Kombe Fitebo	12-Jul	12	10	8	18	2	0.2	2.0	0
	New		MWENSE Total							120	101	106	207	20	8.85	15.00	0

Monitoring Sheet for Simple Weir Schemes Constructed in 2015 (As of End of October, 2015)

Achievement (New Sites and Improvement Sites)

Year	Type	Province	District	Site No.	Camp Name	Name of the BEO/ CEO	Category of Officer	Site Name	Date Weir is Improved	No. of member Household	No. of member farmers			Weir Type ²	Canal Length (km)	Original + Newly Irrigated Area (Hm)	No of Fish pond
											Male	Female	Total				
2015	IMP	Luapula	MWENSE	94	Kankolmba	H. Kalobwe	Main	Finkesenge		4	4	4	8	1	0.45	5.00	0
2015	IMP	Luapula	MWENSE	95	Katuta	M. Chungu	Main	Fiteba	10-Aug	9	7	5	12	3	0.34	4.00	0
2015	IMP	Luapula	MWENSE	96	Lukwesa	A. Katongo	Main	Kanawa		3	8	6	14	4	3.00	6.00	3
2015	IMP	Luapula	MWENSE	97	Lukwesa	A. Katongo	Main	Lukwesa	4-Sep	3	3	7	10	2	1.20	3.00	2
2015	IMP	Luapula	MWENSE	98	Lukwesa	A. Katongo	Main	Kaimba	20-Sep	2	5	3	8	2	1.00	2.00	2
2015	IMP	Luapula	MWENSE	99	Kashiba	L. Mukwanje	TSB	Gershom	20-Aug	3	8	7	15	2	1.00	5.00	0
	IMP		MWENSE Total							24	35	32	67	14	6.99	25.00	7
2015	New	Luapula	NCHELENGE	133	Nchelenge Central	Besa Janet	Main	Kulungu	28-Jul	16	10		10	1	0.1	5.0	0
2015	New	Luapula	NCHELENGE	134	Nchelenge Central	Besa Janet	Main	Changa Fisali	8-Aug	12	8	4	12	13	0.0	0.0	0
2015	New	Luapula	NCHELENGE	135	Mulwe	Musonda.G.	Main	Chibolya	30-Jun	20	18	10	28	1	0.5	0.0	0
2015	New	Luapula	NCHELENGE	136	Mulwe	Musonda.G.	Main	Chipili	28-May	25	12	7	19	0	0.3	4.0	0
2015	New	Luapula	NCHELENGE	137	Mulwe	Musonda.G.	Main	Piyala	19-Jun	15	10	6	16	1	0.2	2.0	0
2015	New	Luapula	NCHELENGE	138	Kasamba	Musonda.G.	Main	Kaseketi	22-Sep	30	40	10	50	2	0.0	0.0	0
	New		NCHELENGE Total							118	98	37	135	18	1.10	11.00	0
	New		Luapula P. Total							678	727	490	1,217	116	47.74	81.30	10
	IMP		Luapula P. Total							273	249	194	443	71	37.89	94.80	102
	New		3 Provinces Total							2,260	2,360	1,757	4,117		121.25	249.40	36
	IMP		3 Provinces Total							1,658	1,650	1,096	2,746		208.37	608.75	236

Monitoring Sheet for Simple Weir Schemes Constructed in 2016 (As of End of October, 2016)

Achievement (New Sites)

No.	District	Camp	Name of TSB/BEO/CEO	Site Name	No. of member Household	No. of member farmers			Canal Length	Area irrigated	No. of fish pond	Dissemination by Officers to Farmers (Y: yes, N: no)							Application of Disseminated Technology by Farmers (Y: yes, N: no)								
						Male	Female	Total				Irrigation Tech		Farming Tech					Market-Oriented Farming	Irrigation Tech		Farming Tech					Market-Oriented Farming
												O&M	On-Farm Irrigation	Contour-ridge	Soil Improve	Companion cropping	Nutritious crop	Others		O&M	On-Farm Irrigation	Contour-ridge	Soil Improve	Companion cropping	Nutritious crop	Others	
						Nos.	Nos.	Nos.				Σ Nos.	km	lima	Nos.	O&M	On-Farm Irrigation	Contour-ridge	Soil Improve	Companion c ropping	Nutritious crop	Others	Market-Oriented Farming	O&M	On-Farm Irrigation	Contour-ridge	Soil Improve
1	Kasama	TSB	Francis K. Bwalya	Kateshi	14	8	16	24	2.80	12.60	4	Y	Y	Y	Y	Y	Y	N	Y	N	Y	Y	Y	N	Y		
2	Kasama	TSB	Kanda Prudence	Kalulu	22	18	13	31	6.70	5.10	0	Y	Y	Y	Y	Y	Y	N	Y	N	Y	Y	Y	Y	N	Y	
3	Kasama	TSB	Catherine Chileshe	Misambo	24	9	7	16	1.80	12.00	0	Y	Y	N	Y	Y	Y	N	Y	N	Y	Y	Y	Y	Y	Y	
4	Kasama	TSB	Phillip Chitongwa	Milundo	17	12	18	30	2.30	4.00	0	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	
5	Kasama	TSB	Phillip Chitongwa	Sume	42	10	12	22	4.10	7.00	2	Y	Y	N	Y	N	Y	Y	Y	N	Y	N	Y	Y	N	Y	
6	Kasama	TSB	Phillip Chitongwa	Raphael Mubanga	52	24	18	42	3.90	2.30	12	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	
7	Kasama	TSB	Phillip Chitongwa	Mankalala	17	12	8	20	2.40	6.70	0	Y	N	Y	Y	N	Y	Y	Y	N	Y	N	Y	Y	N	Y	
8	Kasama	Kasonde Chisuna	Valness Zulu	Kaseke	27	29	23	52	2.50	4.50	0	Y	Y	N	N	Y	Y	Y	Y	N	Y	Y	Y	Y	N	Y	
9	Kasama	Kasonde Chisuna	Valness Zulu	Chisanga	13	11	9	20	0.75	1.50	0	Y	Y	Y	Y	N	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	
10	Kasama	Chilufya	Gift Zimba	Maipambe	21	32	28	60	0.57	0.20	0	Y	N	N	Y	N	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	
11	Kasama	Chilufya	Gift Zimba	Chimallio	17	20	10	30	0.30	2.00	0	Y	Y	Y	Y	Y	Y	Y	N	Y	N	Y	Y	N	N	N	
12	Kasama	Chilufya	Gift Zimba	Petelonsabo	8	14	11	25	0.40	4.00	0	Y	N	N	N	N	Y	Y	N	N	N	N	N	N	N	N	
13	Kasama	Chilufya	Gift Zimba	Chibote	9	20	15	35	0.30	7.00	0	Y	N	N	N	Y	Y	N	N	N	N	N	N	N	N	N	
14	Kasama	Chilufya	Gift Zimba	Moboshi	7	8	13	21	0.30	0.50	0	Y	Y	N	Y	N	Y	N	Y	N	N	N	Y	N	Y	N	
Kasama Total					290	227	201	428	29.12	69.40	18																
15	Mungwi	Chafumbu	Andrew Timba	Nsongolo	15	25	12	37	1.00	4.00	2	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N	
16	Mungwi	Chafumbu	Andrew Timba	Munwa	12	13	15	28	1.20	3.00	0	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N	
17	Mungwi	TSB	Judith Nanyangwe	Pamuchina	11	18	20	38	2.60	8.20	0	Y	Y	Y	Y	N	Y	Y	N	Y	Y	Y	N	Y	Y	N	
18	Mungwi	Mungwi west	Karen Chilembo	Chendela	16	35	32	67	3.50	5.00	1	Y	Y	Y	Y	N	Y	Y	N	Y	Y	Y	N	Y	Y	N	
19	Mungwi	Nseluka	Lucy Nkhoma	Chishimba	19	30	26	56	1.40	2.60	0	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	N	
20	Mungwi	Nseluka	Lucy Nkhoma	Kapata	15	25	20	45	1.00	2.30	0	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	N	
21	Mungwi	Chonya	Robert Chanda	Nseko	20	15	20	35	1.00	6.00	3	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	N	
22	Mungwi	Chonya	Robert Chanda	Kallaku Swela	30	25	15	40	1.50	8.00	4	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	N	
23	Mungwi	Malole North	Augustine Katuwende	Bwambi	24	17	15	32	0.80	6.40	0	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
24	Mungwi	TSB	Olivier Chanda	Kampanda	15	20	18	38	1.00	8.00	7	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	N	
Mungwi Total					177	223	193	416	15.00	53.50	17																
25	Luwingu	Shimumbi	Gerald Kawimbe	Mubeshe	48	27	31	58	0.70	4.00	0	Y	Y	Y	Y	N	N	N	Y	Y	Y	Y	N	N	N	Y	
26	Luwingu	Shimumbi	Gerald Kawimbe	Fikonkota	51	33	21	54	0.90	4.80	0	Y	Y	Y	Y	N	N	N	N	Y	Y	N	Y	N	N	N	
27	Luwingu	Chifwile	Kelvin Mumba	Bushimbe	12	9	13	22	0.80	0.40	1	Y	Y	Y	Y	N	Y	N	Y	Y	Y	Y	N	N	Y	Y	
28	Luwingu	Chibaya	Joshua Muyunda	Chibusa	10	6	4	10	0.10	10.00	0	Y	Y	Y	N	N	Y	N	Y	Y	Y	Y	N	N	Y	Y	
29	Luwingu	Chibaya	Joshua Muyunda	Mulala	11	8	3	11	0.10	8.00	0	Y	Y	Y	N	N	Y	N	Y	Y	Y	Y	N	N	Y	Y	
30	Luwingu	TSB	Chabu Stanley	Chifumo	12	7	5	12	0.70	2.80	0	Y	Y	Y	N	N	N	N	N	Y	N	N	N	N	N	N	
Luwingu Total					144	90	77	167	3.30	30.00	1																

Monitoring Sheet for Simple Weir Schemes Constructed in 2016 (As of End of October, 2016)

Achievement (Improvement Sites)

No.	District	Camp	Name of TSB/BEO/CEO	Site Name	No. of member Household	No. of member farmers			Canal			Irrigated Area			No. of Fish Pond			Dissemination by Officers to Farmers (Y: yes, N: no)								Application of Disseminated Technology by Farmers (Y: yes, N: no)							
						Male	Female	Total	(A)	(B)	(A)+(B)	(c)	(d)	(c)+(d)	(e)	(f)	(e)+(f)	Irrigation Tech		Farming Tech					Market-Oriented Farming	Irrigation Tech		Farming Tech					Market-Oriented Farming
																		O&M	On-Farm Irrigation	Contour-ridge	Soil Improve	Companion cropping	Nutritious crop	Others		O&M	On-Farm Irrigation	Contour-ridge	Soil Improve	Companion cropping	Nutritious crop	Others	
						Nos.	Nos.	Nos.	Σ Nos.	km	km	Σ km	lima	lima	Σ lima	Nos.	Nos.	Σ Nos.															
125	Kawambwa	Musungu	Ngenda Joseph	Miswau	9	11	6	17	0.80	0.40	1.20	1.50	1.00	2.50	1	0	1	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	N	N	Y	N	N
126	Kawambwa	Musungu	Ngenda Joseph	Manjelebwe	10	11	4	15	0.40	0.00	0.40	0.20	0.30	0.50	0	0	0	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	N	N	Y	N	N
127	Kawambwa	Musungu	Ngenda Joseph	Luongo	7	9	4	13	1.00	0.50	1.50	0.90	0.50	1.40	1	0	1	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	N	N	Y	N	N	
128	Kawambwa	Muyembe	Peggy Makofi	Mitongwa	3	6	8	14	3.50	2.00	5.50	1.50	1.00	2.50	0	0	0	N	Y	Y	Y	Y	Y	N	Y	N	Y	N	Y	Y	Y	Y	
129	Kawambwa	Muyembe	Peggy Makofi	Lubulafita II	10	25	30	55	3.00	2.00	5.00	1.00	0.50	1.50	0	0	0	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	N	Y	Y	Y
130	Kawambwa	Lengwe	Phiri Elliot	Nsemive	7	9	7	16	0.90	0.50	1.40	1.70	1.00	2.70	2	2	4	Y	Y	Y	N	N	Y	N	Y	Y	N	Y	N	N	Y	Y	Y
Kawambwa Total					46	71	59	130	9.60	5.40	15.00	6.80	4.30	11.10	4	2	6																
131	Mwense	Mubende	Chalwe John	Mubende	25	16	9	25	1.50	1.50	3.00	4.00	4.00	8.00	6	2	8	Y	Y	N	N	N	N	Y	Y	Y	Y	N	N	N	Y	Y	Y
132	Mwense	Mubende	Chalwe John	Chibwe	11	18	13	31	3.00	3.00	6.00	9.00	9.00	18.00	8	1	9	Y	Y	N	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
133	Mwense	Munua	Dickens Chikwekwe	Mulenga	4	4	4	8	0.50	1.00	1.50	2.00	2.00	4.00	0	0	0	Y	Y	Y	N	N	Y	N	Y	Y	Y	N	N	Y	N	Y	
134	Mwense	Munua	Lovemore Mukwanje	Kalusha	5	6	4	10	0.50	1.00	1.50	2.00	2.00	4.00	0	0	0	Y	Y	Y	N	N	Y	N	Y	Y	Y	N	N	Y	N	Y	
Mwense Total					45	44	30	74	5.50	6.50	12.00	17.00	17.00	34.00	14	3	17																
135	Mwansabombwe	Chilange	Lostone Mwelwa	Sebo	12	24	6	30	1.00	0.50	1.50	0.60	1.00	1.60	1	0	1	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
136	Mwansabombwe	Chilange	Lostone Mwelwa	Easther	11	24	7	31	0.50	0.80	1.30	1.50	0.50	2.00	2	0	2	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
137	Mwansabombwe	Kayo	Kangwa Joseph	Kambi-Kambi	10	11	5	16	0.30	0.40	0.70	0.25	7.75	8.00	7	9	16	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N	Y	Y	
138	Mwansabombwe	Kapesa	Sakala Pearson	Kasenda2	8	12	7	19	0.15	0.60	0.75	0.45	1.50	1.95	4	0	4	N	Y	N	Y	N	Y	Y	N	N	N	Y	N	N	N		
139	Mwansabombwe	Kapesa	Ngenda Inambao	Kasengwi	12	23	15	38	1.20	0.00	1.20	6.50	0.50	7.00	4	0	4	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
Mwansabombwe Total					53	94	40	134	3.15	2.30	5.45	9.30	11.25	20.55	16	9	27																
Luapula P					411	487	262	749	33.92	25.93	59.85	110.85	70.33	181.18	52	17	69																
3 Provinces					2,371	2,453	1,806	4,259	183.69	119.58	303.27	536.20	405.68	941.88	98	35	133																

Monitoring Sheet for Simple Weir Schemes constructed in 2014 and 2015 (As of End of October, 2016)

District: Kasama

Please indicate "Y" for the ones the officer has disseminated by End of Oct 2016 and "N" for the ones not disseminated
Please indicate "Y" for the ones the farmers have applied by End of Oct 2016 and "N" for the ones not applied

Construction Year	Camp	CEO	Site Name	New or Imp as of construction year	Achievement in 2014 or 2015				Achievement by End of October 2016 <u>in TOTAL</u>							Dissemination by Officers by End of October 2016 (Y: yes, N: no)								Application by Farmers by End of October 2016 (Y: yes, N: no)																			
					No. of member Farmers in the site				Canal Length (km)	Area irrigated (lima)	No. of fish pond	No. of member Farmers in the site				Canal Length (km)	Area irrigated (lima)	No. of fish pond	Irrigation Tech			Farming Tech					Irrigation Tech			Farming Tech					Market-Oriented Farming								
					No. of HH	Male	Female	Total				No. of HH	Male	Female	Total				O&M	On-Farm Irrigation	Contour-ridge	Soil Improve	Companion cropping	Nutritious crop	Others	O&M	On-Farm Irrigation	Contour-ridge	Soil Improve	Companion cropping	Nutritious crop	Others											
Constructed In 2015	Kapanda	Bwalya Mulenga	Nsanje	New	15	12	3	15	0.60	2.00	4	15	12	3	15	0.60	2.00	4	Y	Y	Y	N	Y	Y	Y	N	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	N	N	Y				
	Kapanda	Bwalya Mulenga	Kakoko	New	22	8	14	22	0.30	1.00	1	22	8	14	22	0.30	1.00	1	Y	Y	Y	N	Y	N	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	N	Y				
	Kapanda	Bwalya Mulenga	Twikatane	New	21	13	8	21	0.37	1.50	0	21	13	8	21	0.37	1.50	0	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	N	Y	Y	N	Y			
	Kapanda	Bwalya Mulenga	Malanda	New	16	9	7	16	0.50	0.25	0	16	9	7	16	0.50	0.25	0	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N			
	Kapanda	Bwalya Mulenga	Musanda	New	23	12	11	23	1.50	4.00	3	12	12	11	23	1.50	4.00	3	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	N	Y		
	Bulanda	Prekeria Mbeve	Mumana Lupando	New	25	10	15	25	1.00	1.00	0	30	12	16	25	4.00	4.00	12	Y	Y	Y	N	Y	Y	N	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	N	Y	Y	N	Y		
	Bulanda	Prekeria Mbeve	Mubanga Lupiya	New	30	22	8	30	0.50	1.50	0	30	22	8	30	2.00	1.50	0	Y	Y	Y	N	Y	Y	N	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	N	Y	Y	N	Y		
	Bulanda	Prekeria Mbeve	Kaleyia	New	20	11	9	20	1.50	2.00	0	20	11	9	20	1.50	2.00	0	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N		
	Mulanshi	Jeremiah Banda	Lukashya	New	35	15	20	35	1.50	3.50	0	35	15	20	35	1.50	3.50	0	Y	Y	Y	N	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	
	Mulanshi	Jeremiah Banda	Lubusha	New	21	14	7	21	1.00	2.50	0	21	14	7	21	1.00	2.50	0	Y	Y	N	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	N	Y	Y	Y	Y	Y		
	Milungu West	Phillip Chitongwa	Milundo	New	11	7	4	11	4.80	5.00	0	23	12	8	11	6.00	22.00	2	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	N	Y	
				Total		239	133	106	239	13.57	24.25	8	245	140	111	239	19.27	44.25	22																								
	Mulanshi	Jeremiah Banda	Mabula	Imp	16	7	9	16	3.50	7.00	10	16	7	9	16	3.50	7.00	10	Y	Y	N	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	N	Y	Y	N	Y	Y		
	Milungu East	Andrew Nyirenda	Mathew Mbulo	Imp	20	11	9	20	2.00	1.00	0	20	11	9	20	2.00	3.00	0	Y	N	N	Y	N	N	N	Y	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Y	
	Ngoli	Catherine Chileshe	Sume	Imp	25	12	13	25	3.00	1.50	0	25	12	13	25	4.00	4.00	0	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	N	Y
	Munkonge	Francis K. Bwalya	Chimbala	Imp	12	9	3	12	2.30	12.00	0	12	9	3	12	2.30	12.00	0	Y	Y	Y	N	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	N	Y	
				Total		73	39	34	73	10.80	21.50	10	73	39	34	73	11.80	26.00	10																								

Monitoring Sheet for Simple Weir Schemes constructed in 2014 and 2015 (As of End of October, 2016)

District: Shiwang'andu

Please indicate "Y" for the ones the officer has disseminated by End of Oct 2016 and "N" for the ones not disseminated

Please indicate "Y" for the ones the farmers have applied by End of Oct 2016 and "N" for the ones not applied

Construction Year	Camp	CEO	Site Name	New or Imp as of construction year	Achievement in 2014 or 2015				Achievement by End of October 2016 in TOTAL				Dissemination by Officers by End of October 2016 (Y: yes, N: no)							Application by Farmers by End of October 2016 (Y: yes, N: no)																		
					No. of member Farmers in the site				Canal Length (km)	Area irrigated (lima)	No. of fish pond	No. of member Farmers in the site				Canal Length (km)	Area irrigated (lima)	No. of fish pond	Irrigation Tech			Farming Tech				Market-Oriented Farming	Irrigation Tech			Farming Tech				Market-Oriented Farming				
					No. of HH	Male	Female	Total				No. of HH	Male	Female	Total				O&M	On-Farm Irrigation	Contour-ridge	Soil Improve	Companion cropping	Nutritious crop	Others		O&M	On-Farm Irrigation	Contour-ridge	Soil Improve	Companion cropping	Nutritious crop	Others					
Constructed in 2014		Brian Sazombo	Gombe	Imp	8	10	12	22	0.60	4.00	0	8	10	12	22	1.00	4.50	1	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
	Total				8	10	12	22	0.60	4.00	0	8	10	12	22	1.00	4.50	1																				
	Chasosa	Brian Sazombo	Kabundi	New	10	8	10	18	0.40	1.00	1	10	8	10	18	0.40	0.50	1	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	N	Y	Y	Y	N	Y	Y		
	Lwarya	Mambve Joackim	Itulo	New	6	6	4	10	0.10	0.42	0	6	6	4	10	0.10	0.20	0	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N		
Total				16	14	14	28	0.50	1.42	1	16	14	14	28	0.50	0.70	1																					
Constructed in 2015	Mukungwa	Joackim.M.	Mukungwa	New	20	26	17	43	0.40	0.00	?	0	0	0	0	0.00	0.00	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	C hasosa	Everson.M.	Munjesa	New	12	13	16	29	0.80	0.00	0	12	13	16	29	0.80	0.50	2	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	N	N	N	N	Y	Y		
	Musonko	Chanda. E.	Mpelembe	New	10	10	6	16	0.20	2.00	1	10	10	6	16	0.20	1.90	2	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	
	Total				42	49	39	88	1.40	2.00	1	22	23	22	45	1.00	2.40	4																				
	Musonko	Chanda. E.	Atumani	Imp	8	6	5	11	1.20	2.50	4	8	6	5	11	1.20	2.00	3	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	N	Y	N	Y	N	Y	Y	Y		
	District Chasosa	Brian Sazombo	Chiseko	Imp	7	9	6	15	0.70	5.00	0	7	9	6	15	0.70	4.50	0	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	N	Y	N	Y	Y		
	District	Brian Sazombo	Mpelembe	Imp	10	7	11	18	0.50	1.00	1	10	7	11	18	0.70	1.60	1	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N	Y	Y	Y	Y	
	Total				25	22	22	44	2.40	8.50	5	25	22	22	44	2.60	8.10	4																				

Monitoring Sheet for Simple Weir Schemes constructed in 2014 and 2015 (As of End of October, 2016)

District: Mafinga

Please indicate "Y" for the ones the officer has disseminated by End of Oct 2016 and "N" for the ones not disseminated

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Construction Year	Camp	CEO	Site Name	New or Imp as of construction year	Achievement in 2014 or 2015						Achievement by End of October 2016 in TOTAL						Dissemination by Officers by End of October 2016 (Y: yes, N: no)								Application by Farmers by End of October 2016 (Y: yes, N: no)											
					No. of member Farmers in the site				Canal Length (km)	Area irrigated (lima)	No. of fish pond	No. of member Farmers in the site				Canal Length (km)	Area irrigated (lima)	No. of fish pond	Irrigation Tech			Farming Tech					Market-Oriented Farming	Irrigation Tech			Farming Tech					Market-Oriented Farming
					No. of HH	Male	Female	Total				No. of HH	Male	Female	Total				O&M	On-Farm Irrigation	Contour-ridge	Soil Improve	Companion cropping	Nutritious crop	Others	O&M		On-Farm Irrigation	Contour-ridge	Soil Improve	Companion cropping	Nutritious crop	Others			
Constructed in 2014					NIL																															
Constructed in 2015	TSB Chanama	Emmanuel Chibeluka	Kabiya	IMP	20	23	28	51	1.70	3.00	0	25	28	30	58	1.70	3.50	0	Y	Y	Y	Y	N	Y	N	Y	Y	Y	N	Y	Y	Y	N	Y	N	Y
	Muyombe	Mayembe Nicolas	Kalanga	IMP	33	72	33	105	2.00	5.00	0	35	70	30	100	2.50	5.00	0	Y	Y	N	Y	N	N	N	Y	Y	Y	N	Y	Y	Y	N	N	N	Y
	Chifunda	Nathan Nkota	Janakazi	IMP	5	7	10	17	0.20	4.00	0	7	8	12	20	0.30	5.00	0	Y	Y	N	Y	N	Y	N	Y	Y	Y	Y	Y	Y	N	Y	N	Y	
	Chifunda	Nathan Nkota	Chifunda	IMP	19	18	25	43	0.70	5.00	0	23	21	30	51	0.90	6.00	0	Y	Y	N	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	N	Y	N	Y	
				Total	77	120	96	216	4.60	17.00	0	90	127	102	229	5.40	19.50	0																		
	TSB Chilapo	Emmanuel Chibeluka	Lupita	New	21	18	22	40	0.30	4.00	1	22	19	25	44	0.40	5.00	2	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	N	Y	Y	Y	N	Y	N	Y
	TSB Thendele	Emmanuel Chibeluka	Jamba	New	19	26	19	45	0.20	4.00	0	18	26	23	49	0.30	4.20	0	Y	Y	Y	Y	N	N	N	Y	Y	Y	N	Y	Y	N	Y	N	Y	
	Katanga	Mayembe Nicolas	Kasalauka	New	13	9	17	26	0.17	1.00	0	18	9	20	29	0.17	1.00	0	Y	Y	N	Y	N	N	N	Y	Y	Y	N	Y	N	N	N	N	Y	
	Katanga	Mayembe Nicolas	Mphalayi	New	16	23	14	37	0.12	1.00	0	16	25	14	39	0.12	1.00	0	Y	Y	N	Y	N	N	N	Y	Y	Y	N	Y	N	N	N	N	Y	
	Chifunda	Nathan Nkota	Kambwii	New	10	21	14	35	0.20	4.00	0	20	30	41	71	0.50	6.00	0	Y	Y	N	Y	N	Y	N	Y	Y	Y	N	Y	N	Y	N	Y		
Chifunda	Nathan Nkota	Thili	New	22	25	23	48	0.50	10.00	0	22	30	25	55	0.60	5.00	0	Y	Y	N	Y	Y	Y	N	Y	Y	Y	N	Y	Y	Y	Y	N	Y		
			Total	101	122	109	231	1.49	24.00	1	116	139	148	287	2.09	22.20	2																			

Monitoring Sheet for Simple Weir Schemes constructed in 2014 and 2015 (As of End of October, 2016)

District: Milenge

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Construction Year	Camp	CEO	Site Name	New or Imp as of construction year	Achievement in 2014 or 2015							Achievement by End of October 2016 in TOTAL							Dissemination by Officers by End of October 2016 (Y: yes, N: no)							Application by Farmers by End of October 2016 (Y: yes, N: no)									
					No. of member Farmers in the site				Canal Length (km)	Area irrigated (lima)	No. of fish pond	No. of member Farmers in the site				Canal Length (km)	Area irrigated (lima)	No. of fish pond	Irrigation Tech			Farming Tech				Market-Oriented Farming	Irrigation Tech			Farming Tech				Market-Oriented Farming	
					No. of HH	Male	Female	Total				No. of HH	Male	Female	Total				O&M	On-Farm Irrigation	Contour-ridge	Soil Improve	Companion cropping	Nutritious crop	Others		O&M	On-Farm Irrigation	Contour-ridge	Soil Improve	Companion cropping	Nutritious crop	Others		
Sites constructed in 2014	Mumanse	Shipopa.H	Muchemeshi	Imp	10	10	7	17	1.00	2.50	1	10	10	7	17	1.00	0.00	6	N	Y	N	N	N	N	Y	Y	N	N	N	N	N	N	Y	Y	
	Mupita	Mwanda. B	Kansanda	Imp	15	20	12	32	0.30	2.00	4	12	15	10	25	1.00	1.00	0	Y	Y	N	N	N	N	Y	Y	Y	Y	N	N	N	N	Y	Y	
	Mulumbi	Mazunda. C. M	Bomba	Imp	8	12	8	20	0.25	1.00	0	8	12	8	20	0.10	0.20	0	N	Y	N	N	N	N	Y	Y	N	N	N	N	N	N	Y	Y	
				Total	33	42	27	69	1.55	5.50	5	30	37	25	62	2.10	1.20	6																	
	Mupita	Mwanda. B	Kalali	New	18	25	15	40	0.15	0.00	4	18	25	15	40	0.00	0.00	0	N	N	N	N	N	N	Y	N	N	N	N	N	N	N	N	N	
	Mulumbi	Mazunda. C. M	Lukulashi	New	12	17	8	25	0.20	1.00	0	12	17	8	25	0.00	0.00	0	N	Y	N	N	N	N	Y	N	N	Y	N	N	N	N	Y	Y	
	Kabange	Kango Gracious	Ngoyi	New	11	13	7	20	0.25	2.00	2	11	13	7	20	0.00	0.00	0	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	
	Ngomba	Banda Lackson	Ngomba	New	8	8	7	15	0.10	1.00	0	8	8	7	15	0.10	0.50	0	N	Y	N	N	N	N	Y	Y	N	Y	N	N	N	N	Y	Y	
	Stambuli	Kopa William	Lunuka	New	13	11	7	18	0.20	1.50	1	13	11	7	18	0.00	0.00	0	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
	Kapalala	Mukuma. B	Kapalala	New	10	9	7	16	0.10	1.00	1	10	9	7	16	0.00	0.00	0	N	N	N	N	N	N	Y	N	N	N	N	N	N	N	Y	N	
Mulambo	Sinkala Elliah	Itemba	New	6	6	5	11	0.08	0.50	0	6	6	5	11	1.00	1.00	0	N	Y	N	N	N	N	Y	Y	N	Y	N	N	N	N	Y	Y		
			Total	78	89	56	145	1.08	7.00	8	78	89	56	145	1.10	1.50	0																		
Sites constructed in 2015	Kabange	Lackson Banda	Chiswishi	Imp	15	11	14	25	4.00	4.50	1	16	15	10	25	4.00	5.00	0	N	Y	N	N	N	N	Y	N	N	Y	N	N	Y	N	Y		
	Kabange	Lackson Banda	Chiswishi	Imp	7	6	6	12	3.50	2.75	0	8	7	6	13	4.00	3.00	0	Y	Y	N	N	N	N	Y	Y	N	Y	N	N	N	Y	Y		
	Kabange	Lackson Banda	Chiswishi	Imp	8	8	6	14	2.70	2.25	1	8	8	6	14	3.00	2.00	1	N	Y	N	N	N	N	Y	Y	N	Y	N	N	N	Y	Y		
				Total	30	25	26	51	10.20	9.50	2	32	30	22	52	11.00	10.00	1																	
	Kabange	Lackson Banda	Matontola	New	9	10	6	16	0.45	1.00	0	8	10	6	16	1.00	1.00	0	N	Y	N	N	N	N	Y	Y	N	Y	N	N	N	N	Y	Y	
	Kabange	Lackson Banda	Mibembo	New	15	15	10	25	0.80	3.00	0	10	10	10	20	1.00	3.00	0	N	Y	N	N	N	N	Y	N	N	Y	N	N	N	N	Y	N	
	Kafvanka	Mandala Hara	Kamvango	New	7	9	5	14	0.20	2.00	0	7	9	5	14	1.00	1.00	0	N	Y	N	N	N	N	N	Y	N	N	N	N	N	N	N	N	
Kafvanka	Mandala Hara	Akampumbulu	New	10	15	9	24	0.00	0.00	0	10	15	9	24	1.00	0.00	0	N	N	N	N	N	N	N	Y	Y	N	N	N	N	N	N	N		
			Total	41	49	30	79	1.85	6.00	0	35	44	30	74	4.00	5.00	0																		

Monitoring Sheet for Simple Weir Schemes constructed in 2014 and 2015 (As of End of October, 2016)

District: Chipili

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Construction Year	Camp	CEO	Site Name	New or Imp	Achievement in 2014 and 2015							Achievement by End of October 2016 in TOTAL							Dissemination by Officers by End of October 2016 (Y: yes, N: no)								Application by Farmers by End of October 2016 (Y: yes, N: no)											
					No. of member Farmers in the site				Canal Length (km)	Area Irrigated (lima)	No. of fish pond	No. of member Farmers in the site				Canal Length (km)	Area Irrigated (lima)	No. of fish pond	Irrigation Tech				Market-Oriented Farming	Irrigation Tech				Market-Oriented Farming										
					No. of HH	Male	Female	Total				No. of HH	Male	Female	Total				O&M	On-Farm Irrigation	Contour-ridge	Soil improve		Companion cropping	Nutritious crop	Others	O&M		On-Farm Irrigation	Contour-ridge	Soil Improve	Companion cropping	Nutritious crop	Others				
2014	Chipili	Dickson Nguni	Kankalamu	New	36	12	24	36	1.00	0.50	0	16	18	12	30	1.00	0.50	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	
			Total		36	12	24	36	1.00	0.50	0	16	18	12	30	1.00	0.50	1																				
2015	Musalango	Barnabas Silomba	Mulla chembe	Imp	6	11	4	15	0.30	4.00	1	10	17	6	23	2.00	6.00	2	N	N	N	N	N	N	N	N	N	Y	Y	N	Y	N	Y	N	Y	Y		
	Musonda	Batister Mwape	Ifumapelo	Imp	9	6	8	14	0.20	1.00	0	9	10	8	18	1.00	2.00	0	Y	Y	N	N	Y	Y	Y	Y	Y	Y	Y	Y	N	N	Y	Y	Y	Y	Y	
			Total		15	17	12	29	0.50	5.00	1	19	27	14	41	3.00	8.00	2																				
	Kanshamba	Gift Phiri	Kanshamba	New	10	21	6	27	0.18	0.00	0	6	15	4	19	0.02	0.50	0	N	Y	N	N	N	Y	N	Y	Y	Y	Y	N	N	N	Y	N	Y	N	Y	
	Musalango	Barnabas Silomba	Musufya	New	10	17	11	28	0.40	0.00	0	8	16	8	24	1.00	1.50	0	N	Y	N	N	N	N	Y	Y	Y	Y	N	N	N	N	N	N	Y	N	Y	
	Mupeta	Barnabas Silomba	Dauti	New	20	15	20	35	0.67	0.30	0	15	15	6	21	0.90	0.63	0	Y	Y	Y	Y	Y	N	N	Y	Y	Y	Y	N	Y	N	Y	N	Y	N	Y	
	Kamami	Barnabas Silomba	Kamami	New	5	4	7	11	0.23	0.20	0	5	3	7	10	0.50	2.00	1	Y	Y	N	N	Y	Y	Y	Y	Y	Y	N	N	N	N	Y	Y	Y	Y		
	Mulpula	Sarah Goma	Katwe	New	15	25	17	42	0.00	0.30	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Mukonshi	Miriam Chikashi	Chibalashi	New	20	12	20	32	0.13	0.20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			Total		80	94	81	175	1.43	1.00	0	34	49	25	74	2.42	4.63	1																				

Monitoring Sheet for Simple Weir Schemes constructed in 2014 and 2015 (As of End of October, 2016)

District: Nchelenge

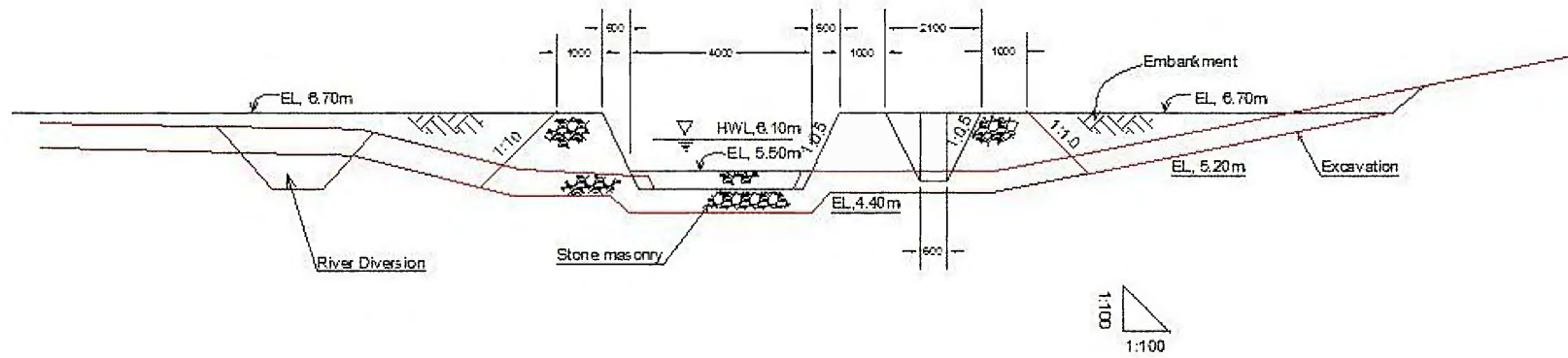
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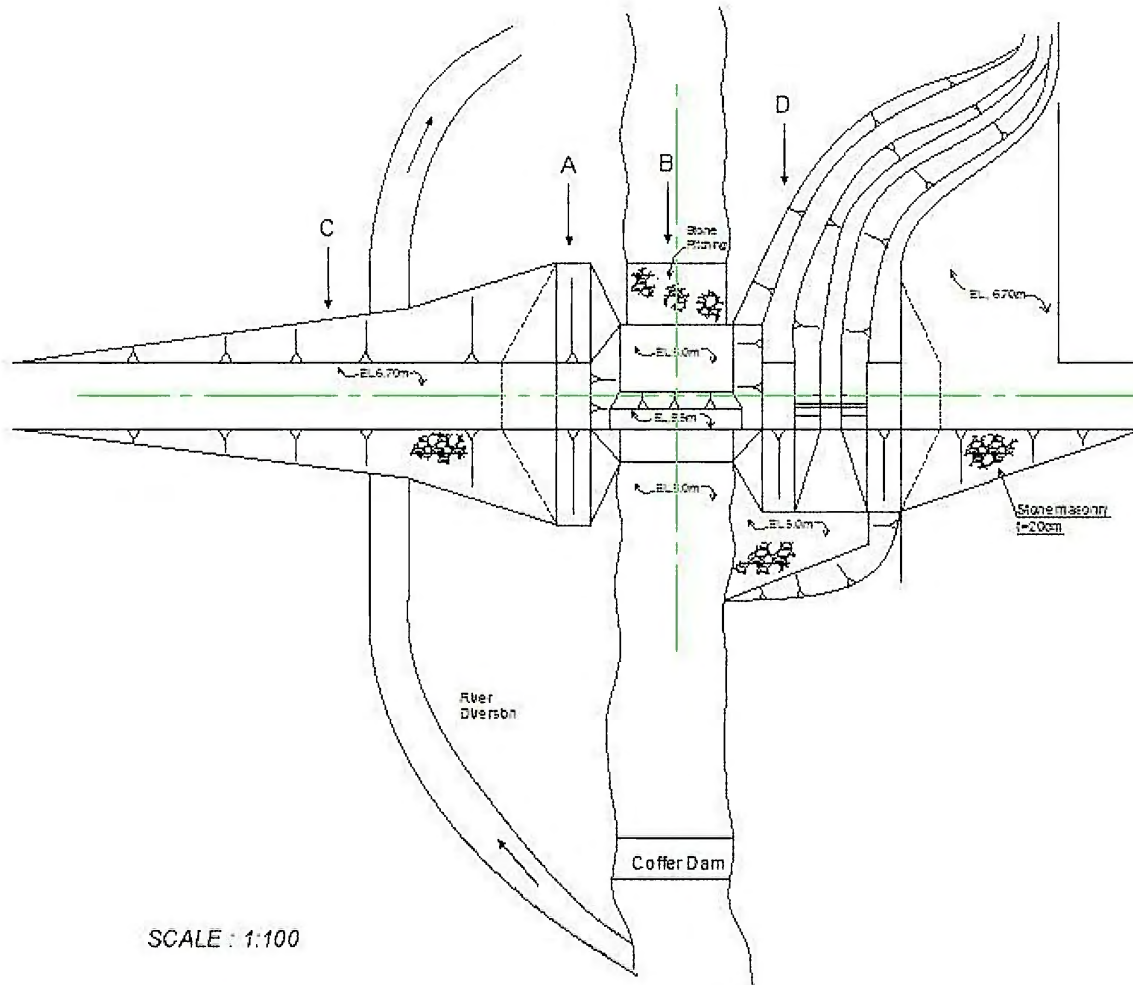
Construction Year	Camp	CEO	Site Name	New or Imp	Achievement in 2014 or 2015						Achievement by End of October 2016 in TOTAL						Dissemination by Officers by End of October 2016 (Y: yes, N: no)								Application by Farmers by End of October 2016 (Y: yes, N: no)														
					No. of member Farmers in the site				Canal Length (km)	Area irrigated (lima)	No. of fish pond	No. of member Farmers in the site				Canal Length (km)	Area irrigated (lima)	No. of fish pond	Irrigation Tech			Farming Tech					Irrigation Tech			Farming Tech					Market-Oriented Farming				
					No. of HH	Male	Female	Total				No. of HH	Male	Female	Total				O&M	On-Farm Irrigation	Contour ridge	Soil Improve	Companion cropping	Nutritious crop	Others	Market-Oriented Farming	O&M	On-Farm Irrigation	Contour ridge	Soil Improve	Companion cropping	Nutritious crop	Others						
2014	Kabuta	Alex Sichula	Munsa	Imp	11	2	12	14	0.20	1.25	0	59	42	40	82	5.47	65.00	0	Y	Y	N	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	N	Y
	Mwalishi	Alex Sichula	Mwalishi	Imp	15	11	6	17	0.30	3.00	0	15	11	6	17	0.00	0.00	0	N	Y	Y	Y	N	N	N	N	N	N	Y	Y	Y	N	N	N	N	N	N	N	
	Munsa	F. Mapulanga	Chansa 1	Imp	2	2	0	2	0.10	0.75	2	2	2	0	2	0.10	0.75	2	N	N	N	Y	N	Y	N	N	N	N	N	Y	N	Y	N	N	N	N	N	N	
	Total				28	15	18	33	0.60	5.00	2	76	55	46	101	5.57	65.75	2																					
2015	Kabuta	Alex Sichula	Kabuta E	New	12	8	22	30	0.40	1.50	0	8	10	12	22	0.40	1.25	0	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	N	Y	Y	Y	N	Y				
	Mulanga	Donald Simpanda	Kafulwa	New	6	4	2	6	0.20	1.00	0	6	4	2	6	0.00	0.00	0	N	N	N	Y	N	N	N	N	N	N	N	Y	N	N	N	N	N	N	N		
	Total				18	12	24	36	0.60	2.50	0	14	14	14	28	0.40	1.25	0																					
2015	Nchelenge Central	Besa Janet	Kulungu	New	16	10	?	10	0.10	5.00	0	24	20	25	45	0.5	0.00	3	N	Y	N	N	N	N	N	Y	N	Y	N	N	N	N	N	N	N	Y			
	Nchelenge Central	Besa Janet	Changa Fisali	New	12	8	4	12	0.00	0.00	0	15	18	16	34	0.00	0.00	0	N	N	N	N	N	N	N	Y	N	N	N	N	N	N	N	N	N	N	Y		
	Mulve	Musonda.G.	Chiboya	New	20	18	10	28	0.50	0.00	0	24	22	20	42	0.50	5.00	0	N	Y	Y	Y	N	Y	N	Y	N	Y	Y	Y	N	Y	N	Y	N	Y			
	Mulve	Musonda.G.	Chipili	New	25	12	7	19	0.30	4.00	0	25	12	7	19	0.30	4.00	0	N	Y	Y	Y	N	N	N	Y	N	Y	Y	Y	N	N	N	N	N	Y			
	Mulve	Musonda.G.	Piyala	New	15	10	6	16	0.20	2.00	0	15	10	6	16	0.20	2.00	0	N	Y	Y	Y	N	N	N	Y	N	Y	Y	Y	N	N	N	N	Y	N	Y		
Kasamba	Tembo T	Kaseketi	New	30	40	10	50	0.00	0.00	0	30	40	10	50	0.00	0.00	0	N	N	N	N	Y	Y	N	N	N	N	N	N	Y	Y	Y	N	N	N	N			
Total				118	98	37	135	1.10	11.00	0	133	122	84	206	1.00	11.00	3																						

MPOROKOSO 14-1 MPELA

AP-II-D-1

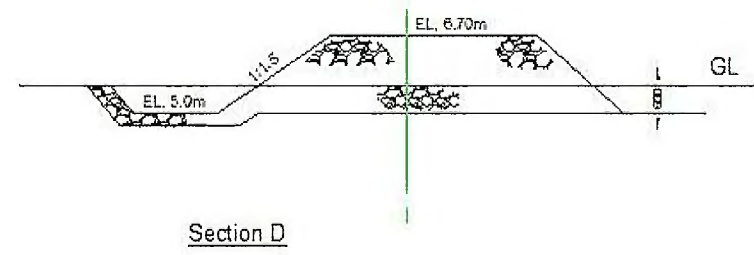
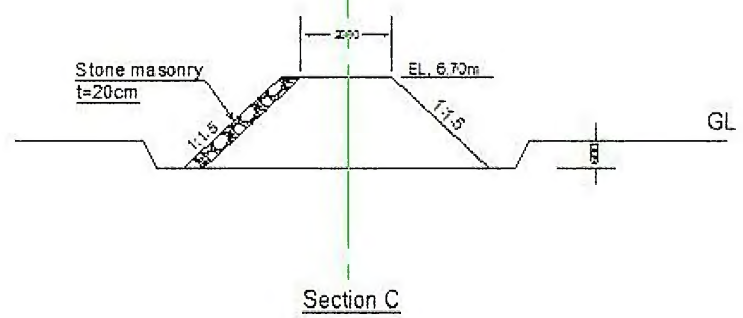
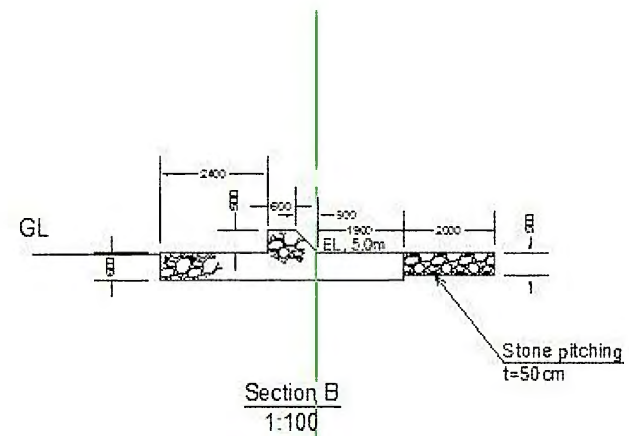
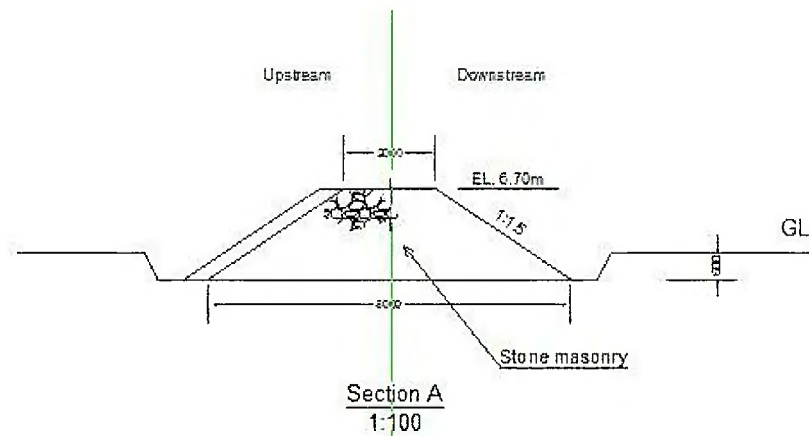


MPOROKOSO 14-1 MPELA



SCALE : 1:100

MPOROKOSO 14-1 MPELA



AP-II-D-3

PROGRESS SCHEDULE MPR 14-1 Mpela

Item No.	Work Description	Quantity	Unit	2014																	
				July			August				September				October			November			
				20	30	10	20	30	10	20	30	10	20	30	10	20	30	10	20	30	
1	Preparation Work			<div style="display: flex; justify-content: space-between; border-top: 1px solid black; border-bottom: 1px solid black;"> July August September October November </div>																	
1-1	Site clearing	5.0	day	10 unskilled labor																	
1-2	Gathering stones	26.2	day	10 unskilled labor																	
1-3	Gathering sand	5.8	day	10 unskilled labor																	
1-4	Preparation of tools	1.0	day	3 unskilled labor																	
2	Temporary Work																				
2-1	Preparation of access road	5.0	day	10 unskilled labor																	
2-2	Preparation of temporary stock yard	1.0	day	10 unskilled labor																	
2-3	Excavation of river diversion	2.2	day	20 unskilled labor																	
2-4	Excavation of left side	3.3	day	20 unskilled labor																	
2-5	Excavation of right side	3.2	day	20 unskilled labor																	
2-6	Construction of coffer dam	2.0	day	20 unskilled labor																	
3	Stone masonry	95.1	day	<div style="border: 1px solid black; padding: 5px; display: inline-block; margin: 5px;"> Stone masonry work 1set 6 unskilled labor 1 skilled labor 4 helper x 2 sets /day </div>																	
3-1	Left side abutment	15.9	day	2sets																	
3-2	Left side bank upstream slope	2.7	day	6 unskilled labor																	
3-3	Weir	1.1	day	6 unskilled labor																	
3-4	Apron	9.2	day	2sets																	
3-5	Right side abutment (left)	50.0	day	6 unskilled labor																	
3-6	Right side abutment (right)	9.5	day	6 unskilled labor																	
3-7	Right side bank upstream slope	1.3	day	6 unskilled labor																	
3-8	Right side intake upstream	2.1	day	6 unskilled labor																	
3-9	Canal lining	2.3	day	6 unskilled labor																	
3-10	Intake	1.0	day	6 unskilled labor																	
3-11	Mortan mixing	43.6	day	<div style="border: 1px solid black; padding: 5px; display: inline-block; margin: 5px;"> Mortar mixing 6 unskilled labor x 2 sets/day </div>																	
4	River bed protection	1.0	day	6 unskilled labor																	
5	Embankment/back filling	11.6	day																		
5-1	Right side	4.2	day	10 unskilled labor																	
5-2	River diversion	2.5	day	15 unskilled labor																	
5-3	Left side	4.9	day	15 unskilled labor																	
6	Weekly Meeting	161.4	day																		
	supervision by CEO, TSB																				
	Supervision by JICA Expert																				
	Foreman																				
	Skilled Labor																				
	Unskilled Labor																				
	Total																				

54

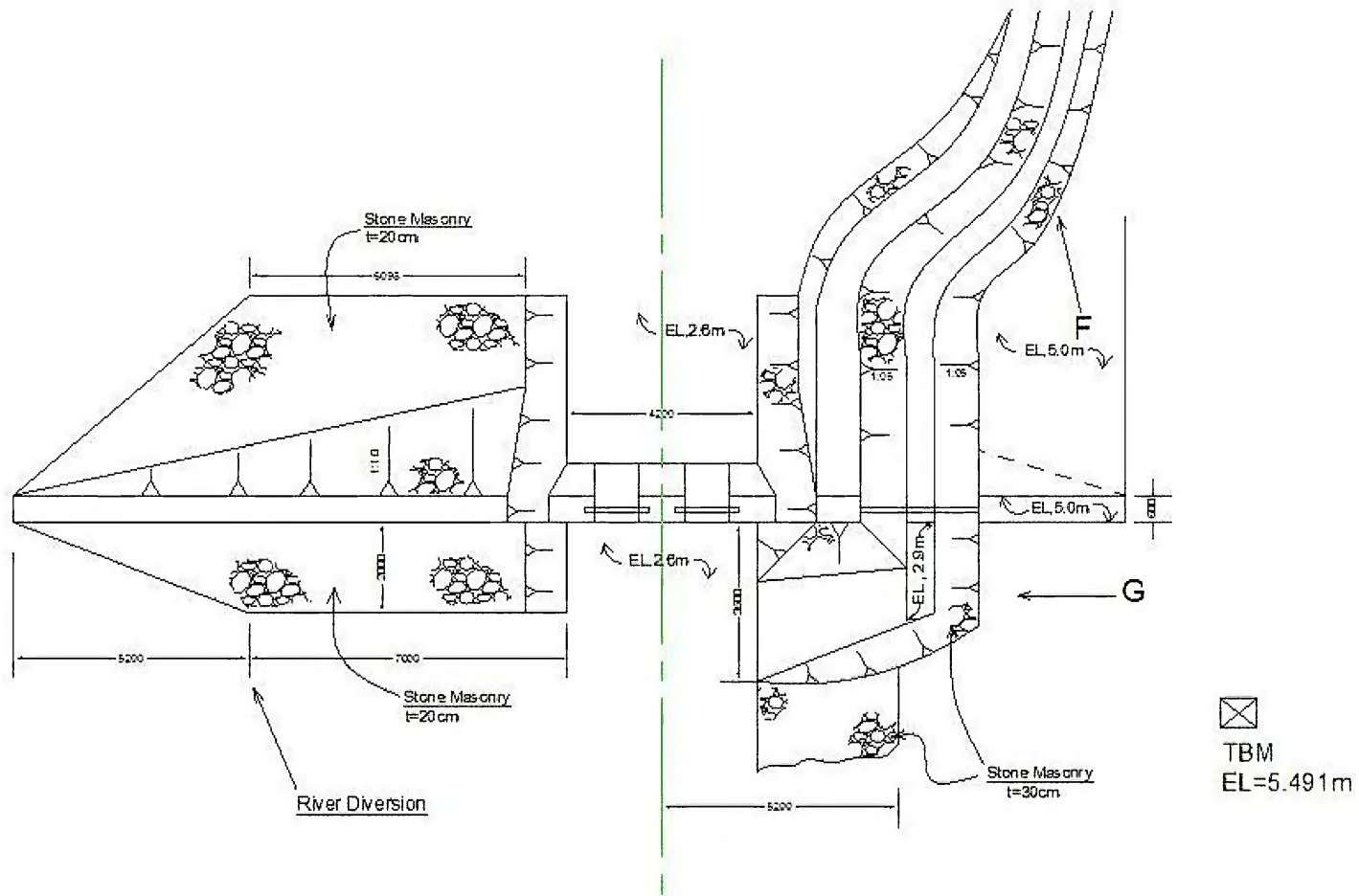
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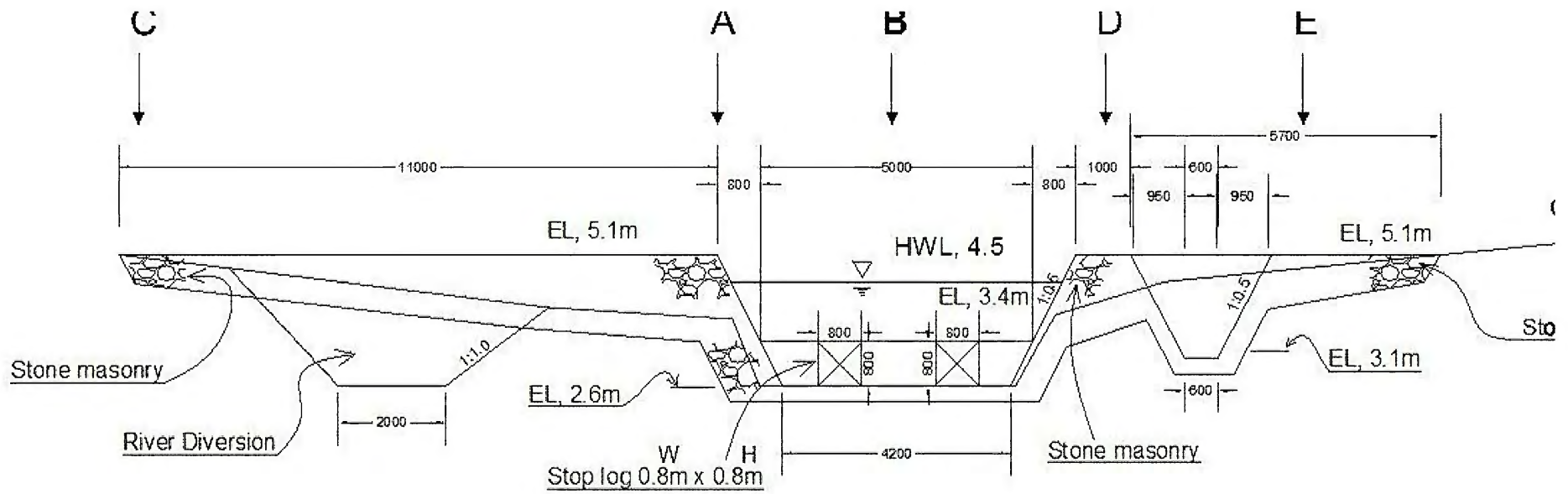
1325

AP-11-D-4

MBALA 2-7 KAWAMA

AP-II-D-5





PROGRESS SCHEDULE MBL 2-7 Kawama

Item No.	Work Description	Quantity		2014												
				July			August			September			October			
				20	30	10	20	30	10	20	30	10	20	30	10	
1	Preparation Work			←-----→												
1-1	Site clearing	5.0	day	10 unskilled labor												
1-2	Gathering stones	5.6	day	30 unskilled labor												
1-3	Gathering sand	5.8	day	10 unskilled labor												
1-4	Preparation of tools	1.0	day	3 unskilled labor												
2	Temporary Work															
2-1	Preparation of access road	5.0	day	10 unskilled labor												
2-2	Preparation of temporary stock yard	1.0	day	10 unskilled labor												
2-3	Excavation of river diversion	11.3	day	20 unskilled labor												
2-4	Excavation of left side	3.1	day	20 unskilled labor												
2-5	Excavation of right side	3.0	day	20 unskilled labor												
2-6	Construction of coffer dam	2.0	day	20 unskilled labor												
3	Stone masonry															
3-1	Left side abutment	12.4	day													
3-2	Left side slope	4.0	day													
3-3	Weir	2.6	day													
3-4	Right side bank	17.7	day													
3-5	Right side abutment	1.6	day													
3-6	Right side upstream protection	2.8	day													
3-7	Canal lining	10.6	day													
3-8	Intake	1.3	day													
3-9	River diversion filling stone masonry	14.5	day													
3-10	Mortan mixing	57.1	day													
4	Embankment/back filling															
4-1	Right side	2.4	day													
4-2	River diversion	12.2	day													
5	Weekly Meeting	124.8	day													
	supervision by CEO, TSB															
	Supervision by JICA Expert															
	Foreman															
	Skilled Labor															36
	Unskilled Labor															1257
	Total															1293

AP-II-D-7

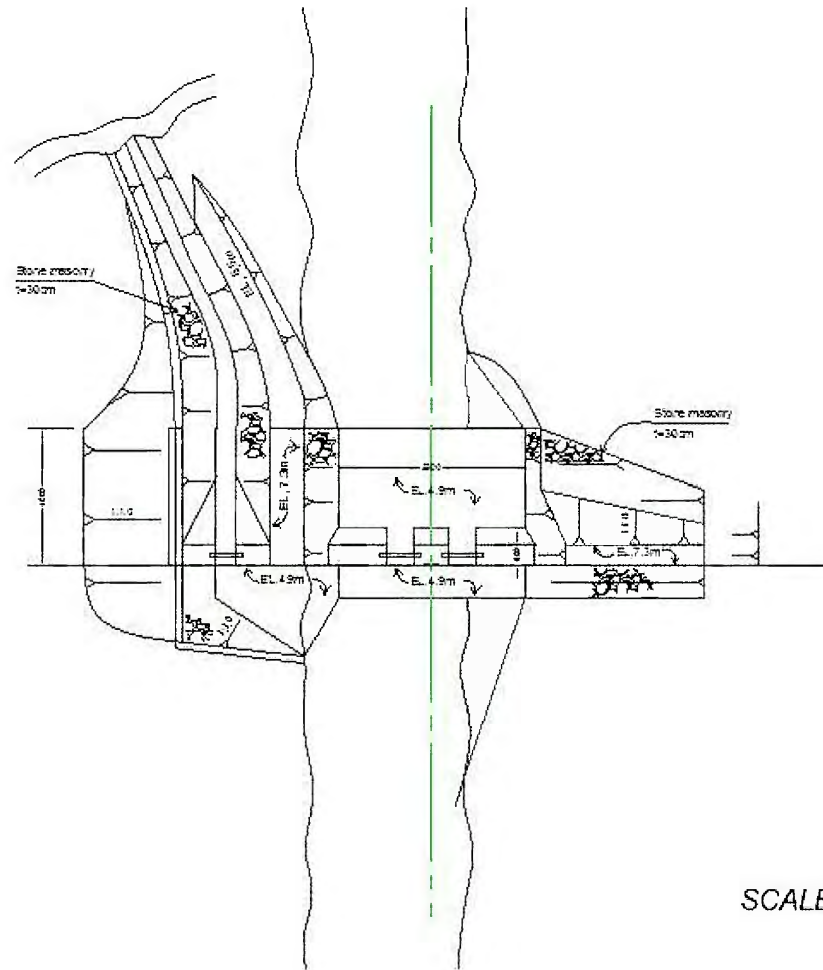
Stone masonry work
1set
6 unskilled labor
1 skilled labor
8 helper

Mortar mixing
6 unskilled labor

3 unskilled labor

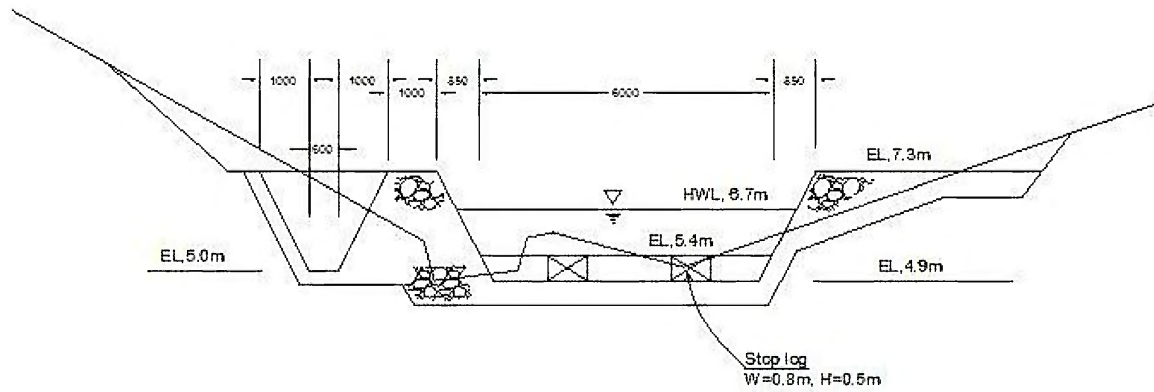
15 unskilled labor

LUWINGU 5-2 MUFILI CHIBWARE



SCALE : 1:100

LUWINGU 5-2 MUFILI CHIBWARE



SCALE: 1:100

PROGRESS SCHEDULE LWG 5-2 Mufili Chibware

Item No.	Work Description	Quantity		2014														
				July			August			September			October			November		
				20	30	10	20	30	10	20	30	10	20	30	10	20	30	10
1	Preparation Work																	
1-1	Site clearing	2.5	day															
1-2	Gathering stones	3.7	day															
1-3	Gathering sand	5.8	day															
1-4	Preparation of tools	1.0	day															
2	Temporary Work																	
2-1	Preparation of access road	5.0	day															
2-2	Preparation of temporary stock yard	1.0	day															
2-3	Excavation of river diversion	0.0	day															
2-4	Excavation of left side	6.2	day															
2-5	Excavation of right side	1.1	day															
2-6	Excavation of apron	2.7	day															
2-7	Construction of coffer dam	1.0	day															
3	Stone masonry		day															
3-1	Left side abutment	26.3	day															
3-2	Left side intake upstream	1.6	day															
3-3	Weir	1.7	day															
3-4	Apron	12.9	day															
3-5	Right side abutment	4.7	day															
3-6	Right side slope	1.8	day															
3-7	Canal lining	2.0	day															
3-8	Intake	2.1	day															
3-9	Mortan mixing	50.5	day															
4	River bed protection	0.0	day															
5	Embankment/back filling	0.0	day															
5-1	Right side	0.0	day															
5-2	River diversion	0.0	day															
5-3	Left side	0.0	day															
6	Weekly Meeting	83.1	day															
	supervision by CEO, TSB																	
	Supervision by JICA Expert																	
	Foreman																	
	Skilled Labor																	
	Unskilled Labor																	
	Total																	

AP-IT-D-10

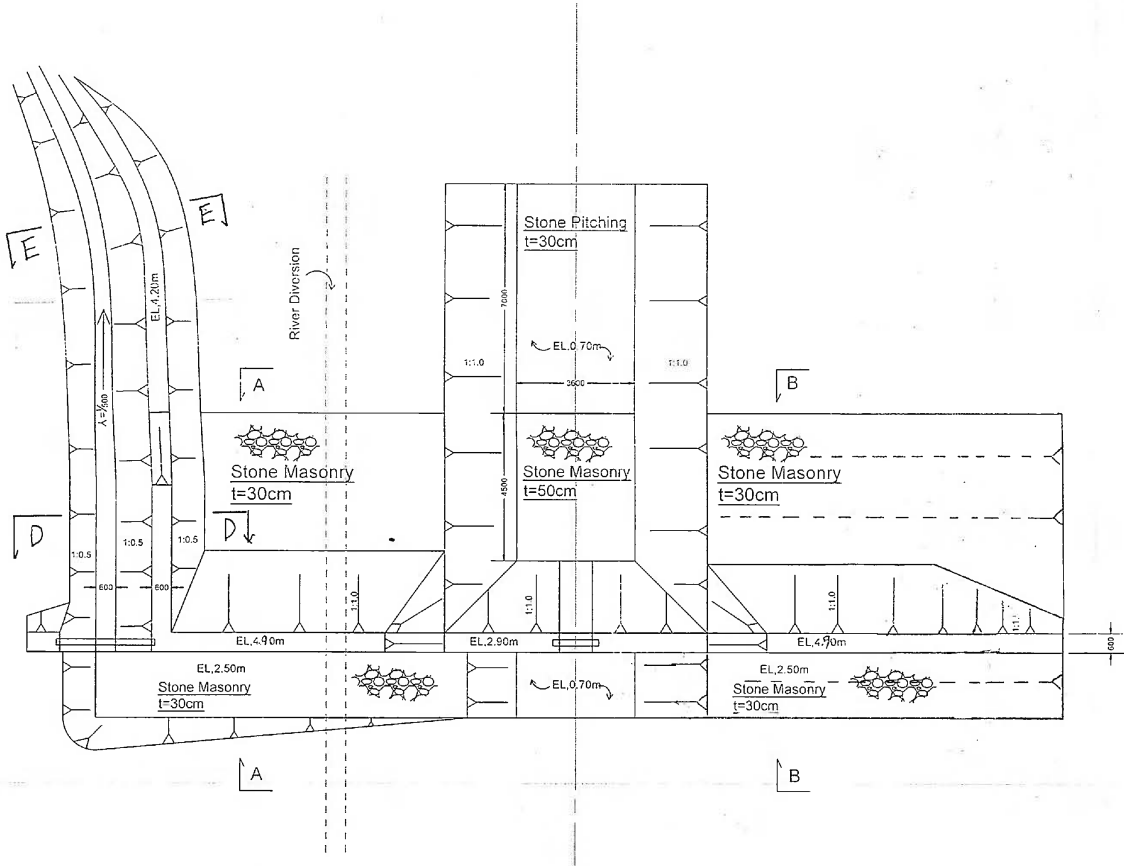
Stone masonry work
6 unskilled labor
1 skilled labor
4 helper
x 1 set/day

Mortar mixing
6 unskilled labor
x 1 set/day

28
703
731

MUNYELE, NSAMA

Rev. 8.14

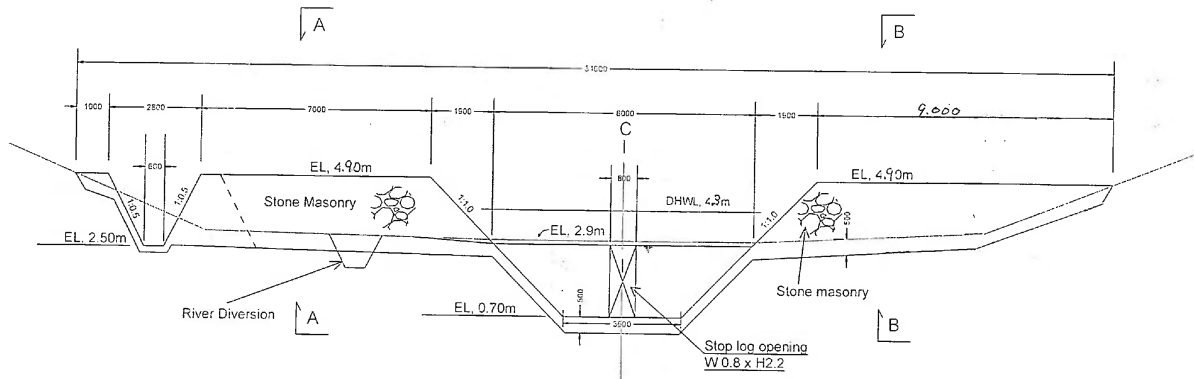


AP-II-D-11

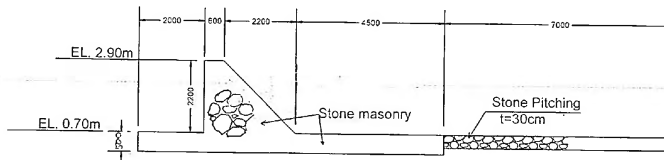
PROJECT	
CLIENT	T-COCSI, JICA
DESIGNED	
DRAWN	DAVID MPHUKA TEMBO
SCALE	1:100
DATE	24/06/2015

MUNYELE, NSAMA

Rev. 8.14



La=4.5
L =11.5
Lb = 7.0



CROSS SECTION C
1:100

PROJECT	
CLIENT	T-COBSI, JICA
DESIGNED	
DRAWN	DAVID MPHUKA TEMBO
SCALE	1:100
DATE	24/06/2015

PROGRESS SCHEDULE NSM Munyele rev.8.14

AP-II-D-13

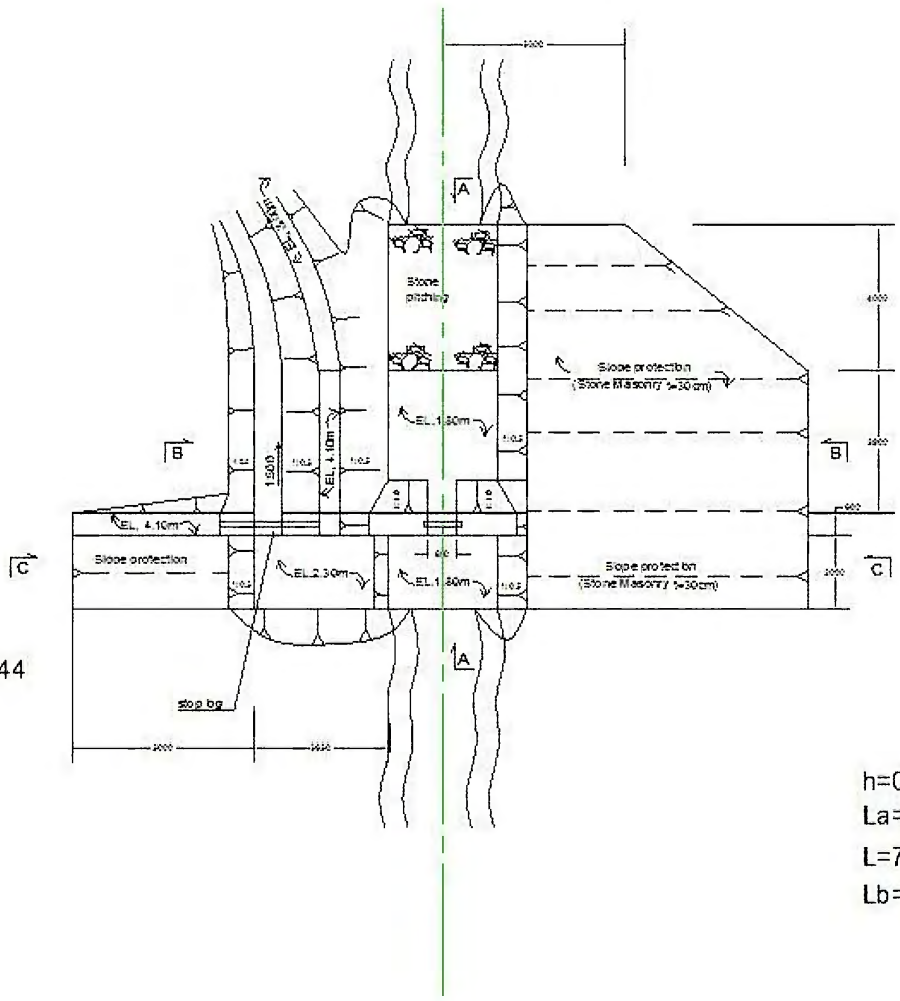
Item No.	Work Description	Quantity		2015																		
		Quantity	Period	July			August			September			October				November					
		unit	unit	10	20	30	10	20	30	10	20	30	10	20	30		10	20	30			
1	Preparation Work																					
1-1	Site clearing	1.0	LS, 2.0 day	■ 25 unskilled labor																		
1-2	Gathering stones	193.0	m ³ , 14.5 day	■ 30 unskilled labor																		
1-3	Gathering sand	73.5	m ³ , 2.8 day	■ 20 unskilled labor																		
1-4	Transportation of Stones and Sand	63.0	trip, 7.0 day	■																		
2	Temporary Work, Excavation																					
2-1	Preparation of access road	1.0	LS, 1.0 day	■ 25 unskilled labor																		
2-2	Preparation of temporary stock yard	1.0	LS, 1.0 day	■ 25 unskilled labor																		
2-3	Excavation of river diversion	31.5	m ³ , 1.8 day	■ 20 unskilled labor																		
2-4	Excavation of left side	48.2	m ³ , 2.8 day	■ 20 unskilled labor																		
2-5	Excavation of right side	58.8	m ³ , 3.4 day	■ 20 unskilled labor																		
2-6	Excavation of apron	45.6	m ³ , 2.7 day	■ 20 unskilled labor																		
2-7	Construction of coffer dam	1.0	LS, 1.0 day	■ 30 unskilled labor																		
3	Stone masonry	167.0	m ³ , 133.1 day																			
3-1	Apron	16.7	m ³ , 15.1 day	■																		
3-2	Spillway	13.5	m ³ , 12.1 day	■																		
3-3	Left Abutment	37.5	m ³ , 33.7 day	■																		
3-4	Left Canal	31.0	m ³ , 27.9 day	■																		
3-5	Left Canal Lining	6.6	m ³ , 5.9 day	■																		
3-6	Left Upstream Slope Protection	12.1	m ³ , 10.9 day	■																		
3-7	Left Downstream Slope Protection	9.8	m ³ , 8.8 day	■																		
3-8	Right Abutment	20.7	m ³ , 18.6 day	■																		
3-9	Right Canal	0.0	m ³ , 0.0 day	■																		
3-10	Right Canal Lining	0.0	m ³ , 0.0 day	■																		
3-11	Right Upstream Slope Protection	12.1	m ³ , 10.9 day	■																		
3-12	Right Downstream Slope Protection	7.0	m ³ , 6.3 day	■																		
3-15	Mortar mixing	91.9	m ³ , 68.9 day	■																		
4	Stone Pitching	12.6	m ³ , 9.5 day	■ 4 unskilled labor																		
5	Embankment/back filling		2.4 day																			
5-1	Backfilling	31.5	m ³ , 2.4 day	■ 15 unskilled labor																		
6	Weekly Meeting supervision by CEO, TSB Supervision by JICA Expert		271.1 day																			
	Foreman																					79
	Skilled Labor																					2042
	Unskilled Labor																					2121
	Total																					

Stone masonry work
1set
6 unskilled labor
1 skilled labor
4 helper
x 2 sets/day

Mortar mixing
6 unskilled labor
x 2 sets/day

MUSANDA, KASAMA (2)

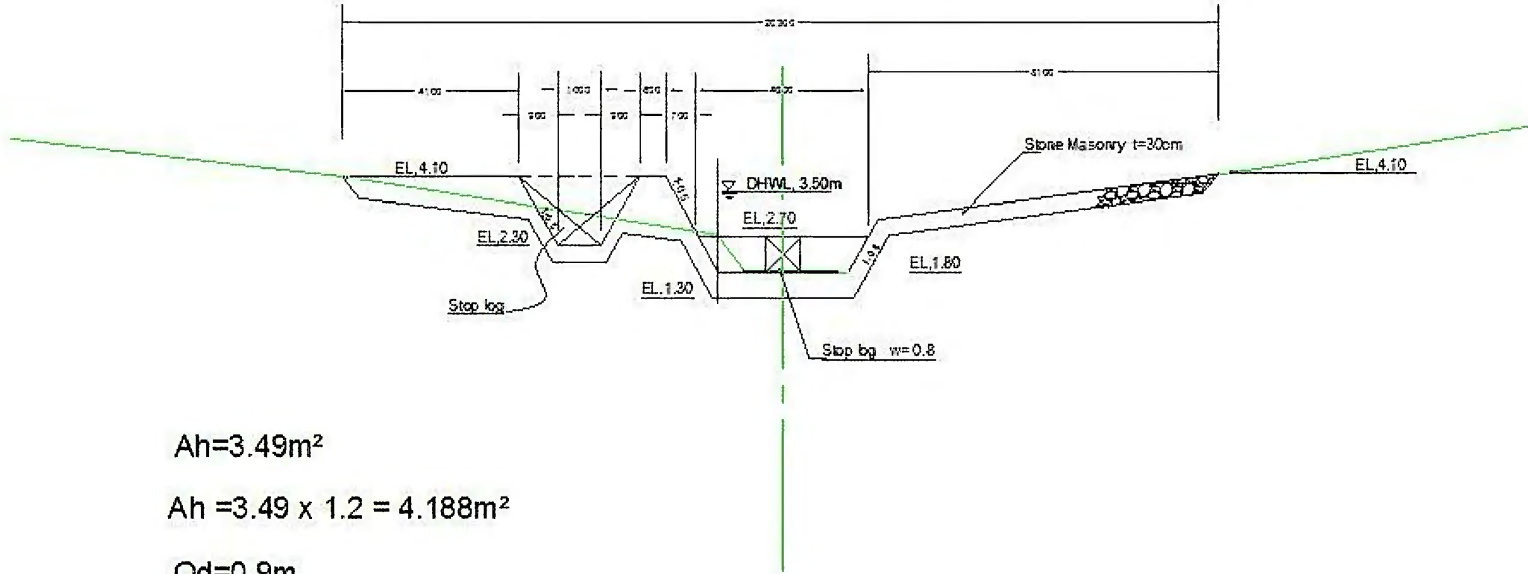
1:100



h=0.9
La=3.0
L=7.0
Lb=4.0

MUSANDA, KASAMA (2)

1:100



$A_h = 3.49\text{m}^2$

$A_h = 3.49 \times 1.2 = 4.188\text{m}^2$

$O_d = 0.9\text{m}$

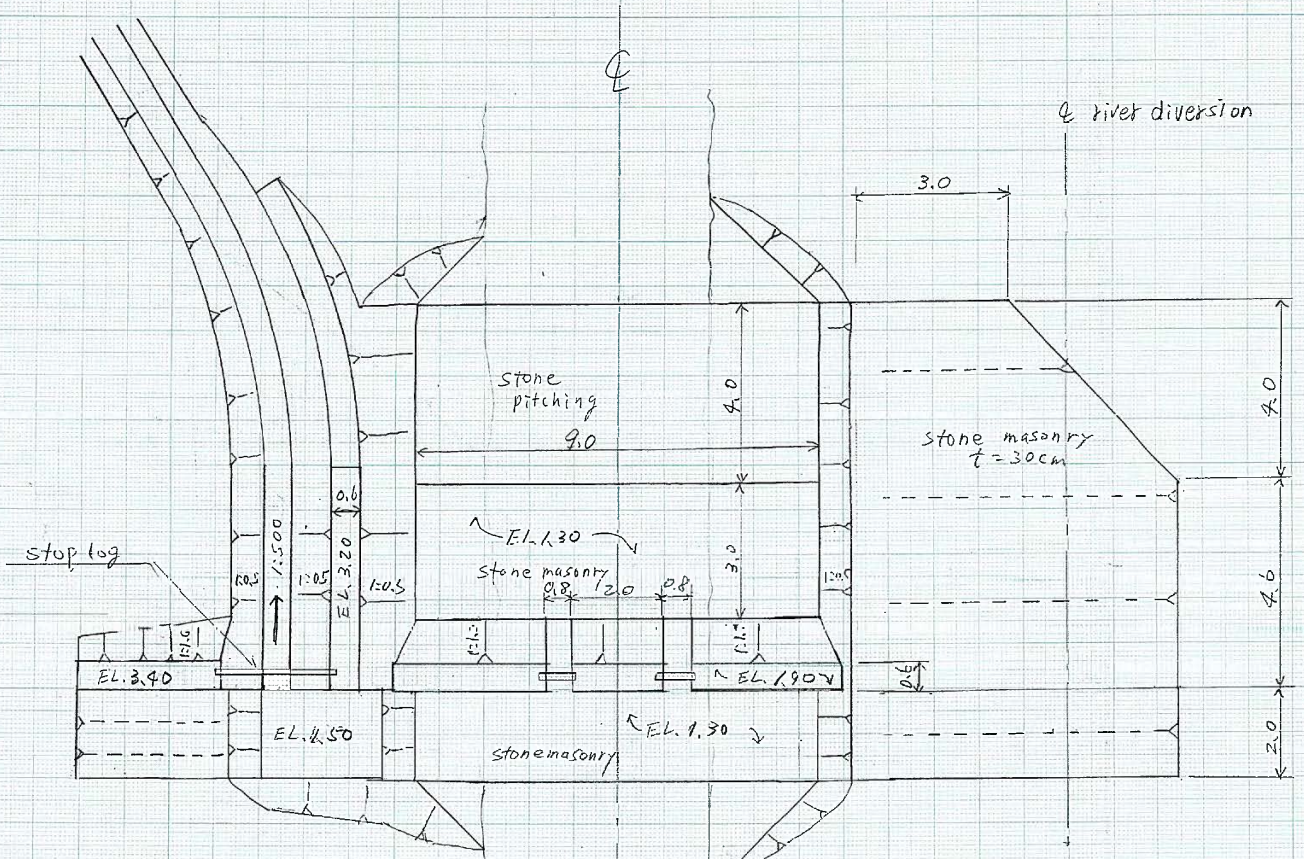
stop log 0.72m^2

$A_{HD} = 3.50 + 0.72 = 4.22\text{m}^2$

AP-II-D-15

TWIKATANE
1:100

BM: EL. 3.665



apron
 $h = 1.0$
 $L_a = 3.0 \text{ m}$
 $L_b = 4.0 \text{ m}$
 $L_l = 7.0 \text{ m}$

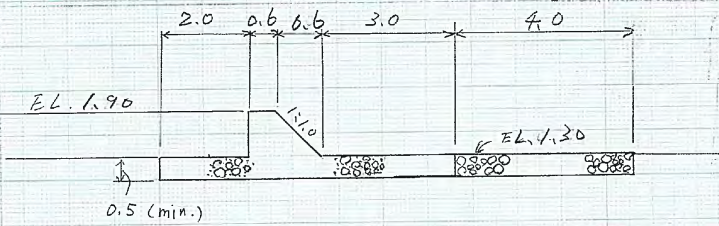
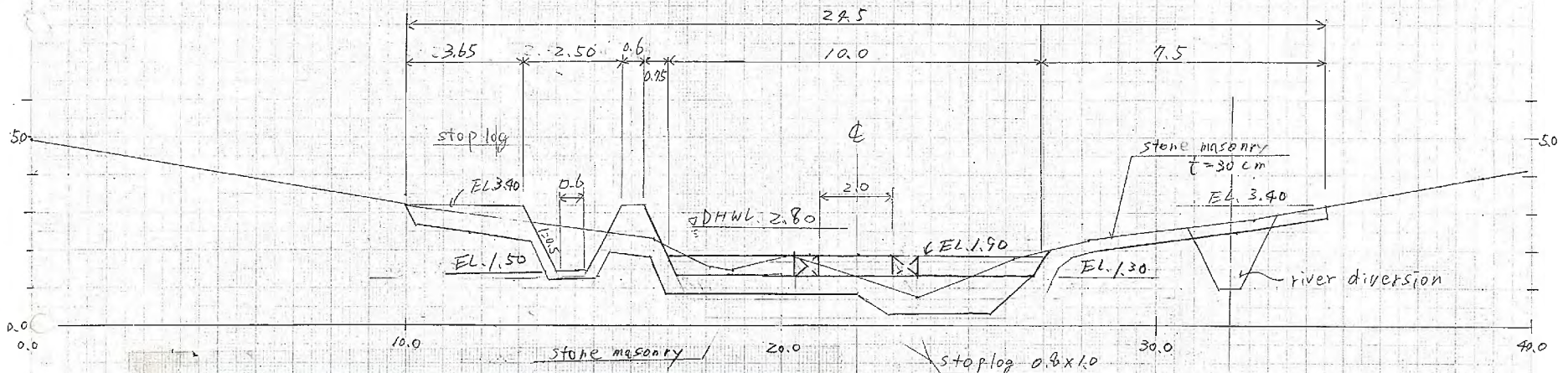
V. 10.07
 Chiba

AP-II-D-17

AP-II-D-18

TWIKATANE

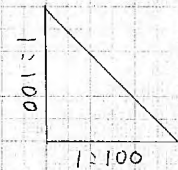
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Cross section A-A
1:100

HWL = EL. 2.30
WL = EL. 2.04

BM: EL = 6.00

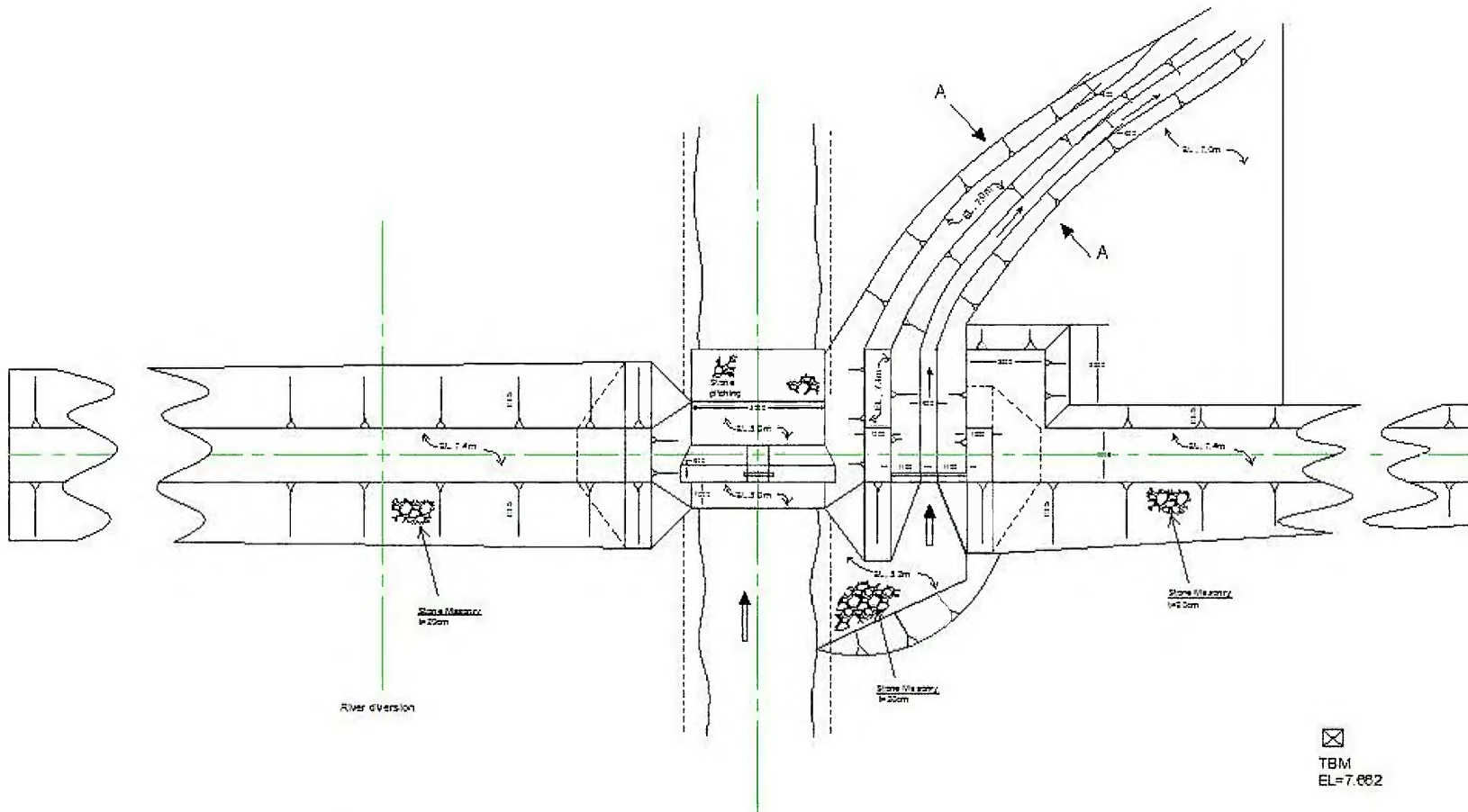


V. 20.07 Chiba

PROGRESS SCHEDULE MGW Twikatane

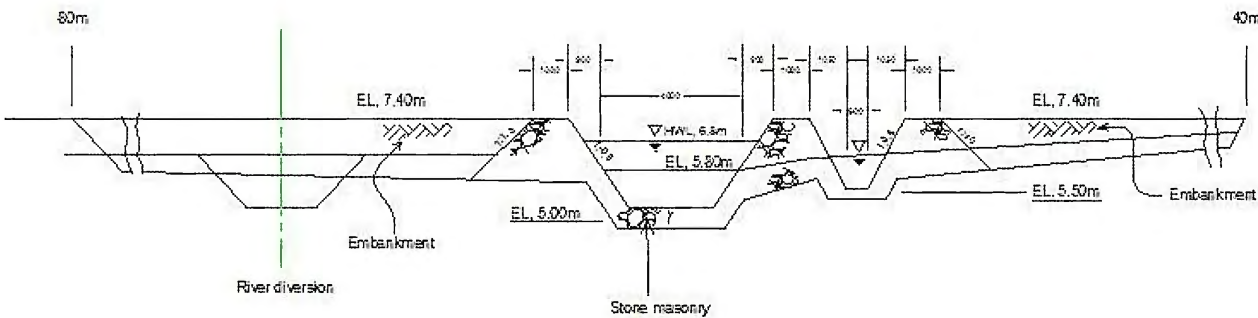
Item No.	Work Description	Quantity		period	2016																													
		Quantity	unit		May	June	July	August	September	October	November																							
					10	20	30	10	20	30	10	20	30	10	20	30	10	20	30	10	20	30	10	20	30	10	20	30	10	20	30			
1	Preparation Work																																	
1-1	Site clearing	1.0	L.S.	2.5	day																													
1-2	Gathering stones	123.9	m ³	9.3	day																													
1-3	Gathering sand	49.5	m ³	3.7	day																													
1-4	Transportation of Stones and Sand	43.3	trip	16.3	day																													
2	Temporary Work: Excavation																																	
2-1	Preparation of access road	1.0	L.S.	1.0	day																													
2-2	Preparation of temporary stock yard	1.0	L.S.	1.0	day																													
2-3	Excavation of river diversion	74.0	m ³	4.3	day																													
2-4	Excavation of left side	61.0	m ³	3.6	day																													
2-5	Excavation of right side	27.8	m ³	1.6	day																													
2-6	Excavation of apron	26.9	m ³	9.0	day																													
2-7	Construction of coffer dam	1.0	L.S.	1.0	day																													
3	Stone masonry	99.9	m ³	89.9	day																													
3-1	Apron	26.9	m ³	24.2	day																													
3-2	Spillway	8.1	m ³	7.3	day																													
3-3	Left Abutment	2.2	m ³	2.0	day																													
3-4	Left Slope Protection	7.7	m ³	7.0	day																													
3-5	Left canal	27.1	m ³	24.4	day																													
3-6	Right Abutment	0.0	m ³	0.0	day																													
3-7	Right Upstream Slope Protection	6.2	m ³	5.6	day																													
3-8	Right Downstream Slope Protection	21.6	m ³	19.4	day																													
3-15	Mortar mixing	54.9	m ³	82.4	day																													
4	Stone Pitching	16.0	m ³	4.8	day																													
5	Embankment/back filling			4.2	day																													
5-1	river diversion	74.0	m ³	4.2	day																													
6	Weekly Meeting			234.6	day																													
	Foreman																																	
	Skilled Labor																																	
	Unskilled Labor					20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20			
	Total					20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20			

NAKONDE 1-3 MUSANZA

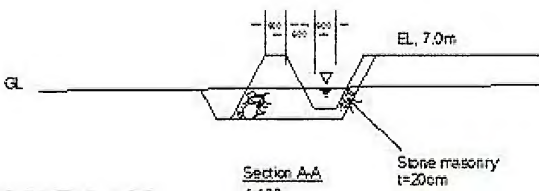


SCALE : 1 : 100

NAKONDE 1-3 MUSANZA



SCALE:1:100



SCALE:1:100

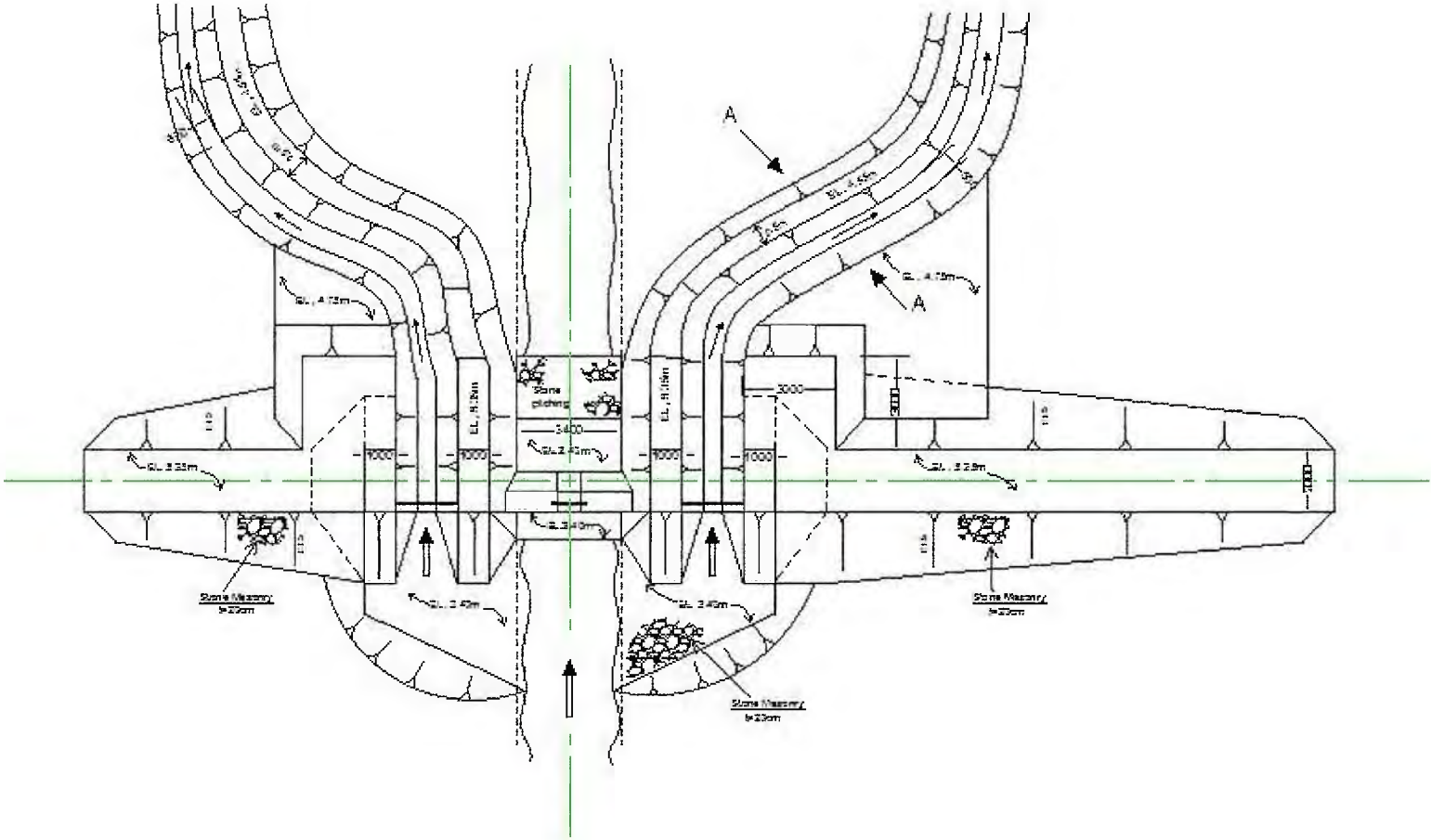
PROGRESS SCHEDULE NKD 1-3 Musanza

Item No.	Work Description	Quantity		2014																	
				July			August			September			October			November			December		
				20	30	10	20	30	10	20	30	10	20	30	10	20	30	10	20	30	10
1	Preparation Work																				
1-1	Site clearing	2.5	day	20 unskilled labor																	
1-2	Gathering stones	17.1	day	20 unskilled labor																	
1-3	Gathering sand	5.8	day	10 unskilled labor																	
1-4	Preparation of tools	1.0	day	-																	
2	Temporary Work, Excavation																				
2-1	Preparation of access road	3.0	day	20 unskilled labor																	
2-2	Preparation of temporary stock yard	1.0	day	20 unskilled labor																	
2-3	Excavation of river diversion	6.9	day	20 unskilled labor																	
2-4	Excavation of left side	8.6	day	30 unskilled labor																	
2-5	Excavation of right side	6.6	day	30 unskilled labor																	
2-6	Excavation of apron	0.6	day	20 unskilled labor																	
2-7	Construction of coffer dam	2.0	day	20 unskilled labor																	
3	Stone masonry	76.4	day																		
3-1	Left side abutment	14.0	day	-																	
3-2	Left side bank upstream slope	22.5	day	-																	
3-3	Weir	2.0	day	-																	
3-4	Apron	6.1	day	-																	
3-5	Right side abutment (left)	20.5	day	-																	
3-6	Right side abutment (right)	11.3	day	-																	
3-7	Right side canal	31.9	day	-																	
3-8	Right side bank upstream slope	11.9	day	-																	
3-9	Intake	2.5	day	-																	
3-10	Mortar mixing	57.2	day	-																	
4	River bed protection	1.8	day																		
5	Embankment/back filling	34.1	day																		
5-1	Left side bank	16.8	day	20 unskilled labor																	
5-2	Left side backfilling	6.7	day	20 unskilled labor																	
5-3	Right side bank	8.5	day	20 unskilled labor																	
5-4	Right side backfilling	2.1	day	20 unskilled labor																	
6	Weekly Meeting	187.4	day	-																	
	supervision by CEO, TSB			-																	
	Supervision by JICA Expert			-																	
	Foreman			-																	
	Skilled Labor			-																	
	Unskilled Labor			-																	
	Total			-																	

70
2190
2260

MPIKA 1-7 LUBANGA

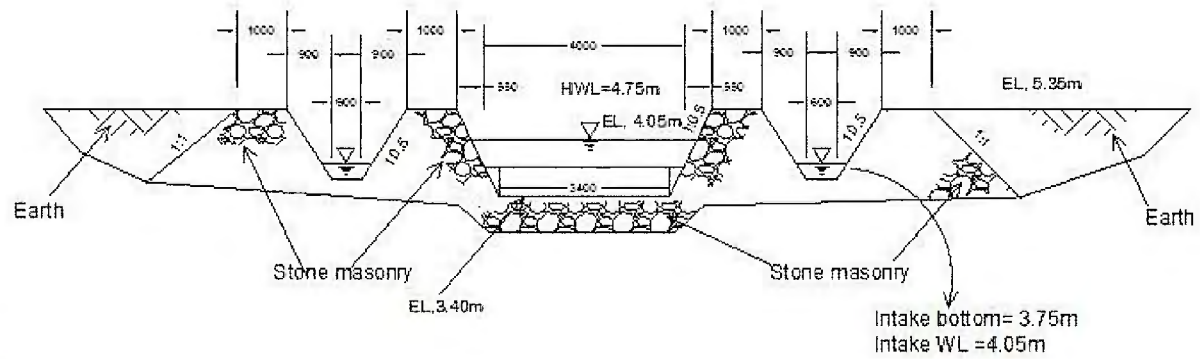
AP-II-D-23



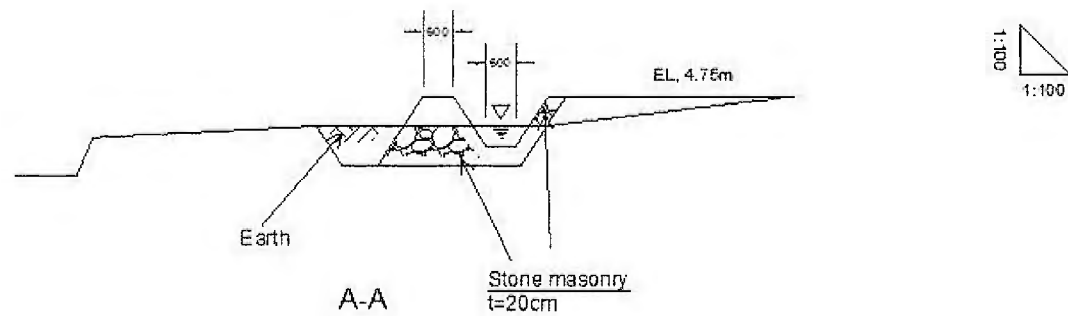
SCALE : 1 : 100

☒ TBM
EL=5.442

MPIKA 1-7 LUBANGA



SCALE : 1 : 100



1:100
1:100

SCALE : 1 : 100

PROGRESS SCHEDULE MPK 1-17 Lubanga

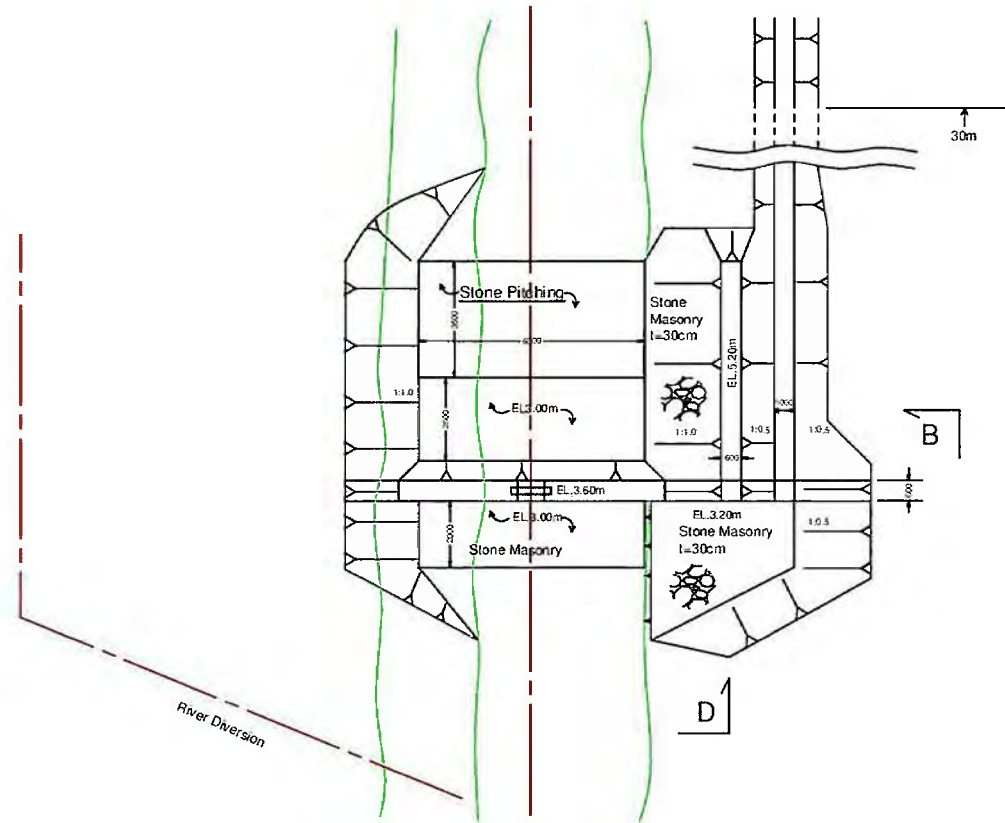
Item No.	Work Description	Quantity		2014																																			
				July							August							September							October							November							
				20	30	10	20	30	10	20	30	10	20	30	10	20	30	10	20	30	10	20	30	10	20	30	10	20	30	10	20	30							
1	Preparation Work																																						
1-1	Site clearing	2.5	day	20 unskilled labor																																			
1-2	Gathering stones	11.4	day	30 unskilled labor																																			
1-3	Gathering sand	5.8	day	10 unskilled labor																																			
1-4	Preparation of	1.0	day																																				
2	Temporary Work, Excavation																																						
2-1	Preparation of access road	3.0	day	20 unskilled labor																																			
2-2	Preparation of temporary stock yard	1.0	day	20 unskilled labor																																			
2-3	Excavation of river diversion	2.2	day																																				
2-4	Excavation of left side	3.7	day	20 unskilled labor																																			
2-5	Excavation of right side	4.7	day	20 unskilled labor																																			
2-6	Excavation of apron	0.6	day	20 unskilled labor																																			
2-7	Construction of coffer dam	2.0	day	20 unskilled labor																																			
3	Stone masonry	109.3	day																																				
3-1	Left side abutment (left)	10.1	day																																				
3-2	Left side abutment (right)	14.7	day																																				
3-3	Left side canal	18.8	day																																				
3-4	Left side bank upstream slope	2.5	day																																				
3-5	Left side intake upstream	8.6	day																																				
3-6	Weir	1.5	day																																				
3-7	Apron	5.3	day																																				
3-8	Right side abutment (left)	17.9	day																																				
3-9	Right side abutment (right)	11.0	day																																				
3-10	Right side canal	18.8	day																																				
3-11	Right side bank upstream slope	4.8	day																																				
3-12	Right side intake upstream	8.6	day																																				
3-13	Intake (left)	0.9	day																																				
3-14	Intake (right)	0.9	day																																				
3-15	Mortar mixing	57.0	day																																				
4	River bed protection	1.8	day	4 unskilled labor																																			
5	Embankment/back filling	9.7	day																																				
5-1	Left side bank	2.1	day	15 unskilled labor																																			
5-2	Left side backfilling	1.1	day	15 unskilled labor																																			
5-3	Right side bank	4.3	day	15 unskilled labor																																			
5-4	Right side backfilling	2.2	day	15 unskilled labor																																			
6	Weekly Meeting	172.1	day																																				
	supervision by CEO, TSB																																						
	Supervision by JICA Expert																																						
	Foreman																																						
	Skilled Labor																																		78				
	Unskilled Labor																																		1755				
	Total																																		1833				

AP-II-D-25

Stone masonry work
1 set
6 unskilled labor
1 skilled labor
4 helper
x 2 sets/day

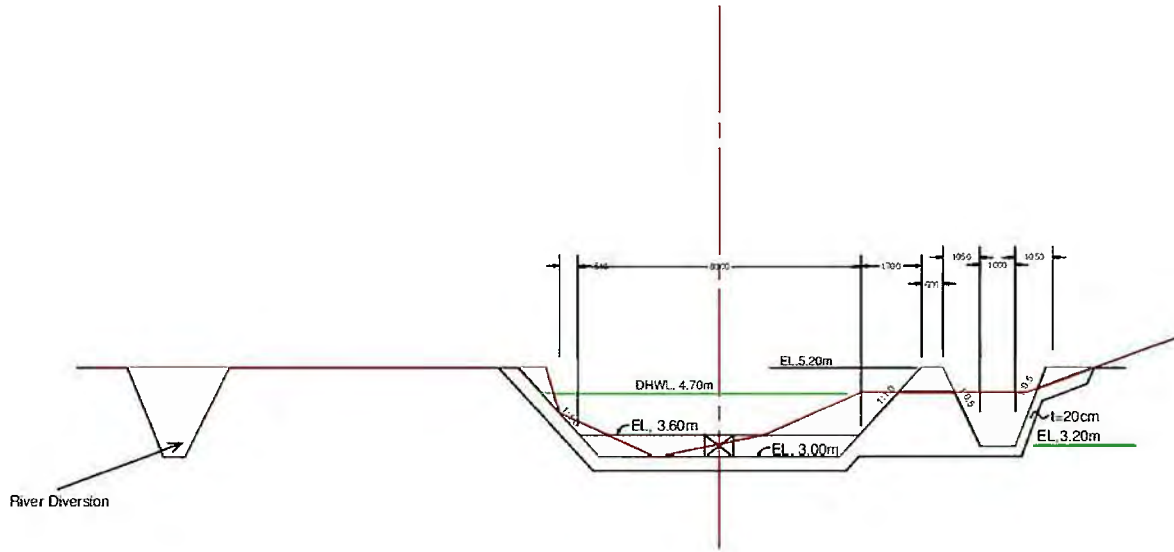
Mortar mixing
6 unskilled labor
x 2 sets/day

LUALIZI, ISOKA

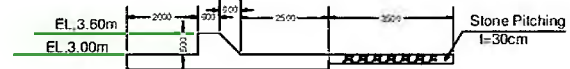


PROJECT	
CLIENT	T-COBSL JICA
DESIGNED	
DRAWN	DAVID MPHUKA TEMBO
SCALE	1:100
DATE	24/06/2015

LUALIZI, ISOKA



h=0.6
La=2.5
Lb = 3.5



CROSS SECTION OF APRON
1:100

1:100

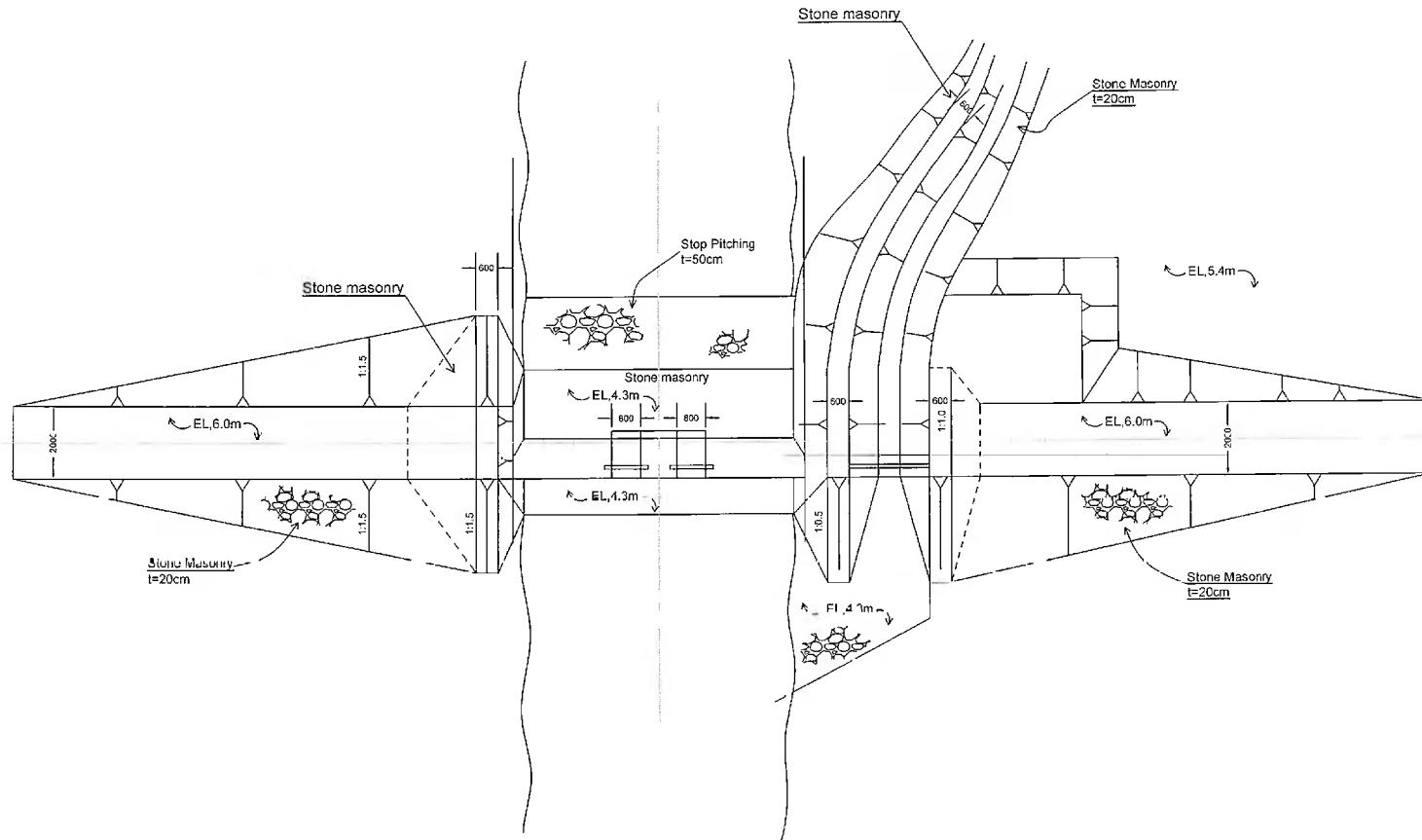
PROJECT	
CLIENT	T-COBSI, JICA
DESIGNED	
DRAWN	DAVID MPHUKA TEMBO
SCALE	1:100
DATE	24/06/2015

PROGRESS SCHEDULE ISK Lualizi

Item No.	Work Description	Quantity		2015																																	
		Quantity	period	July							August							September							October							November					
		unit	unit	10	20	30	10	20	30	10	20	30	10	20	30	10	20	30	10	20	30	10	20	30	10	20	30	10	20	30							
1	Preparation Work																																				
1-1	Site clearing	1.0	LS.	2.0	day	■ 25 unskilled labor																															
1-2	Gathering stones	94.2	m3	7.1	day	■ 30 unskilled labor																															
1-3	Gathering sand	35.5	m3	1.3	day	■ 20 unskilled labor																															
1-4	Transportation of Stones and Sand	30.0	trip	7.0	day	■ 20 unskilled labor																															
2	Temporary Work, Excavation																																				
2-1	Preparation of access road	1.0	LS.	1.0	day	■ 25 unskilled labor																															
2-2	Preparation of temporary stock yard	1.0	LS.	1.0	day	■ 25 unskilled labor																															
2-3	Excavation of river diversion	226.2	m3	17.6	day	■ 15 unskilled labor																															
2-4	Excavation of left side	47.7	m3	3.7	day	■ 15 unskilled labor																															
2-5	Excavation of right side	214.3	m3	16.7	day	■ 15 unskilled labor																															
2-6	Excavation of apron	30.2	m3	2.4	day	■ 20 unskilled labor																															
2-7	Construction of coffer dam	1.0	LS.	1.0	day	■ 30 unskilled labor																															
3	Stone masonry	80.6	m3	72.6	day																																
3-1	Apron	21.9	m3	19.8	day	■																															
3-2	Spillway	4.6	m3	4.2	day	■																															
3-3	Left Abutment	0.0	m3	0.0	day	■																															
3-4	Left Slope Protection	12.7	m3	11.4	day	■																															
3-5	0	0.0	m3	0.0	day	■																															
3-6	Right Abutment	8.6	m3	7.8	day	■																															
3-7	Right Canal lining	22.6	m3	20.4	day	■																															
3-8	Right Upstream Slope Protection	10.1	m3	9.1	day	■																															
						Stone masonry work 1 set 6 unskilled labor 1 skilled labor 4 helper																															
3-15	Mortar mixing	44.3	m3	66.5	day	■																															
4	Stone Pitching	7.1	m3	5.4	day	■																															
5	Embankment/back filling			12.9	day																																
5-1	river diversion	226.2	m3	12.9	day	■ 20 unskilled labor																															
6	Weekly Meeting supervision by CEO, TSB Supervision by JICA Expert			218.2	day	■																															
	Foreman																																				
	Skilled Labor																																				
	Unskilled Labor																																				
	Total																																				

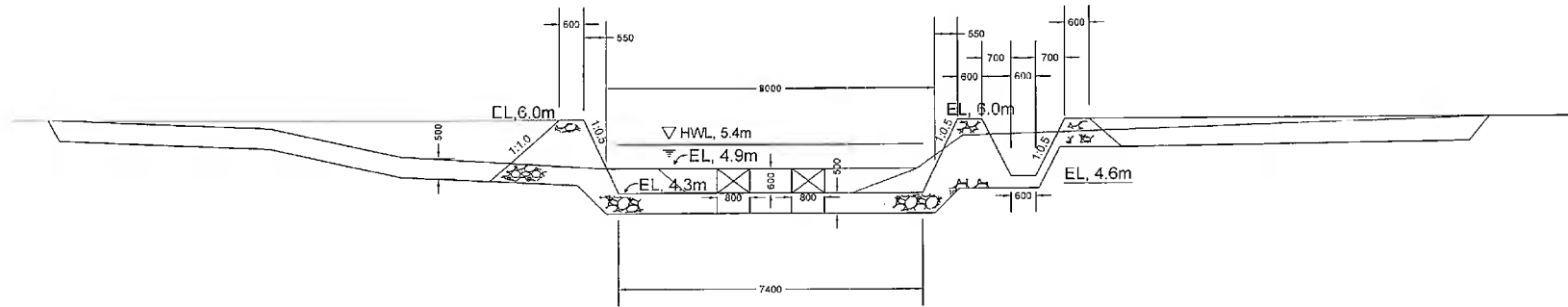
A-11-D-28

MWENSE 6-1 BUYANTANSHI



MP-II-D-29

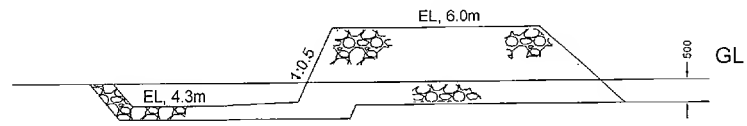
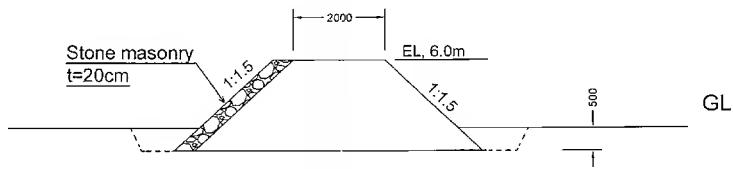
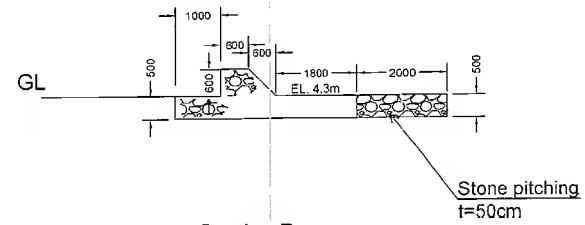
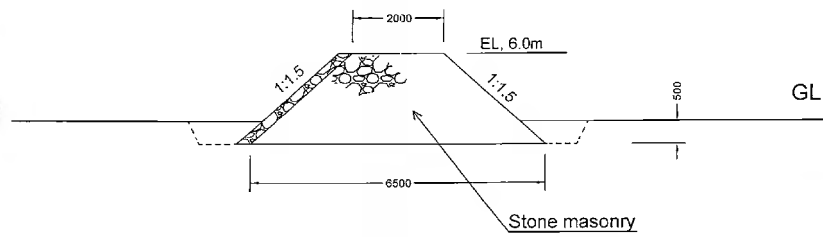
MWENSE 6-1 BUYANTANSHI



AP-II-D-30

MWENSE 6-1 BUYANTANSHI

Upstream Downstream



AP-II-D-31

PROGRESS SCHEDULE MWS 6-1 BUYANTANSHI

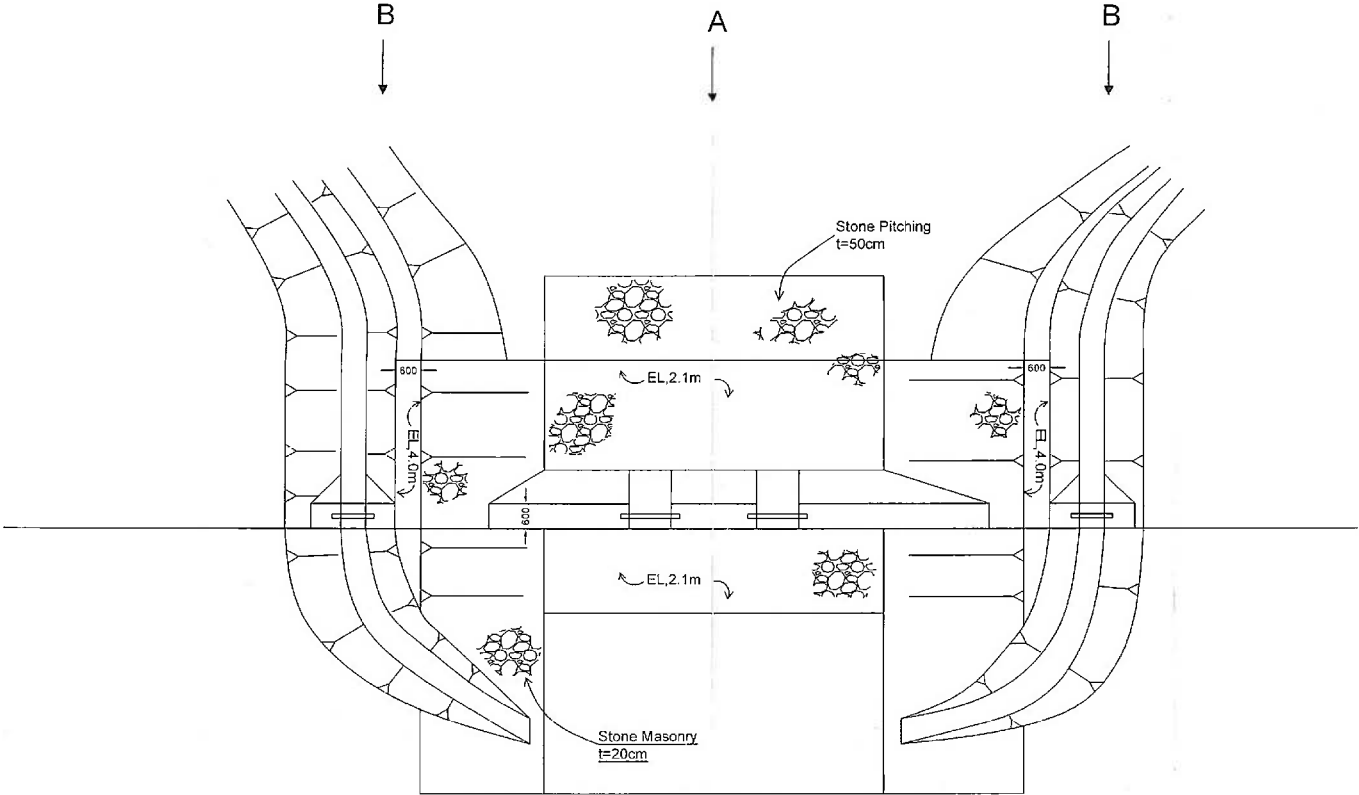
Item No.	Work Description	Quantity		2014																
				July			August			September			October			November				
				20	30	10	20	30	10	20	30	10	20	30	10	20	30	10	20	30
1	Preparation Work																			
1-1	Site clearing	2.5	day																	
1-2	Gathering stones	6.1	day																	
1-3	Gathering sand	5.8	day																	
1-4	Preparation of roots	1.0	day																	
2	Temporary Work																			
2-1	Preparation of access road	5.0	day																	
2-2	Preparation of temporary stock yard	1.0	day																	
2-3	Excavation of river diversion	5.7	day																	
2-4	Excavation of left side	4.7	day																	
2-5	Excavation of right side	5.2	day																	
2-6	Excavation of apron	0.8	day																	
2-7	Construction of coffer dam	2.0	day																	
3	Stone masonry		day																	
3-1	Left side abutment	13.2	day																	
3-2	Left side bank upstream slope	5.1	day																	
3-3	Weir	2.1	day																	
3-4	Apron	9.9	day																	
3-5	Right side abutment (left)	37.9	day																	
3-6	Right side abutment (right)	3.1	day																	
3-7	Right side bank upstream slope	5.6	day																	
3-8	Right side intake upstream	1.8	day																	
3-9	Canal lining	7.5	day																	
3-10	Intake	1.2	day																	
3-11	Mortan mixing	40.1	day																	
4	River bed protection	1.8	day																	
5	Embankment/back filling	15.3	day																	
5-1	Right side	6.3	day																	
5-2	River diversion	3.2	day																	
5-3	Left side	5.7	day																	
6	Weekly Meeting	144.4	day																	
	supervision by CEO, TSB																			
	Supervision by JICA Expert																			
	Foreman																			
	Skilled Labor																			
	Unskilled Labor																			
	Total																			

58

1477

1535

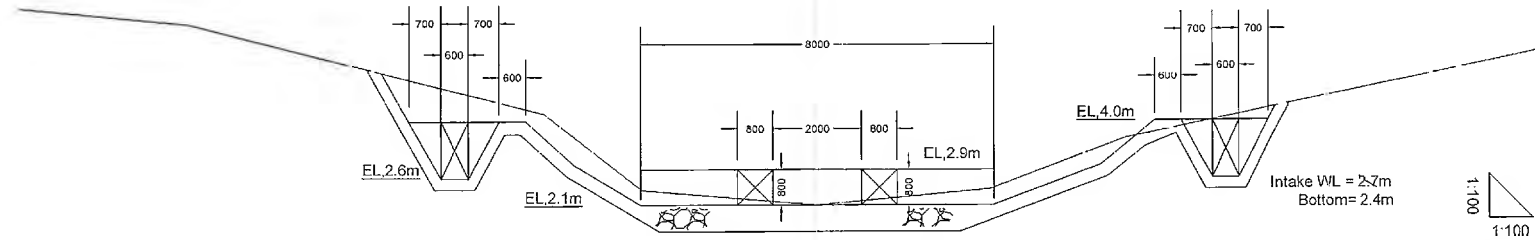
NCHELENGE 6-1 MUNSA



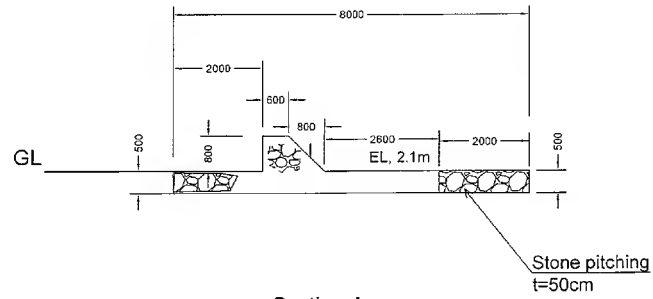
PLAN
1:100

NCHELENGE 6-1 MUNSA

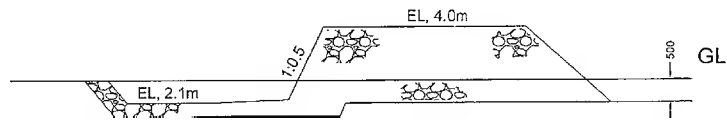
AP-II-D-34



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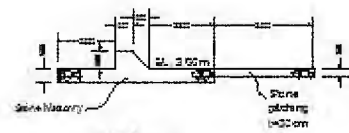
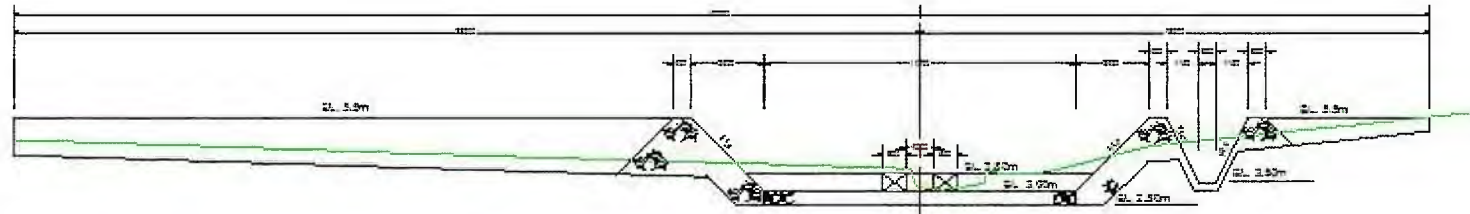
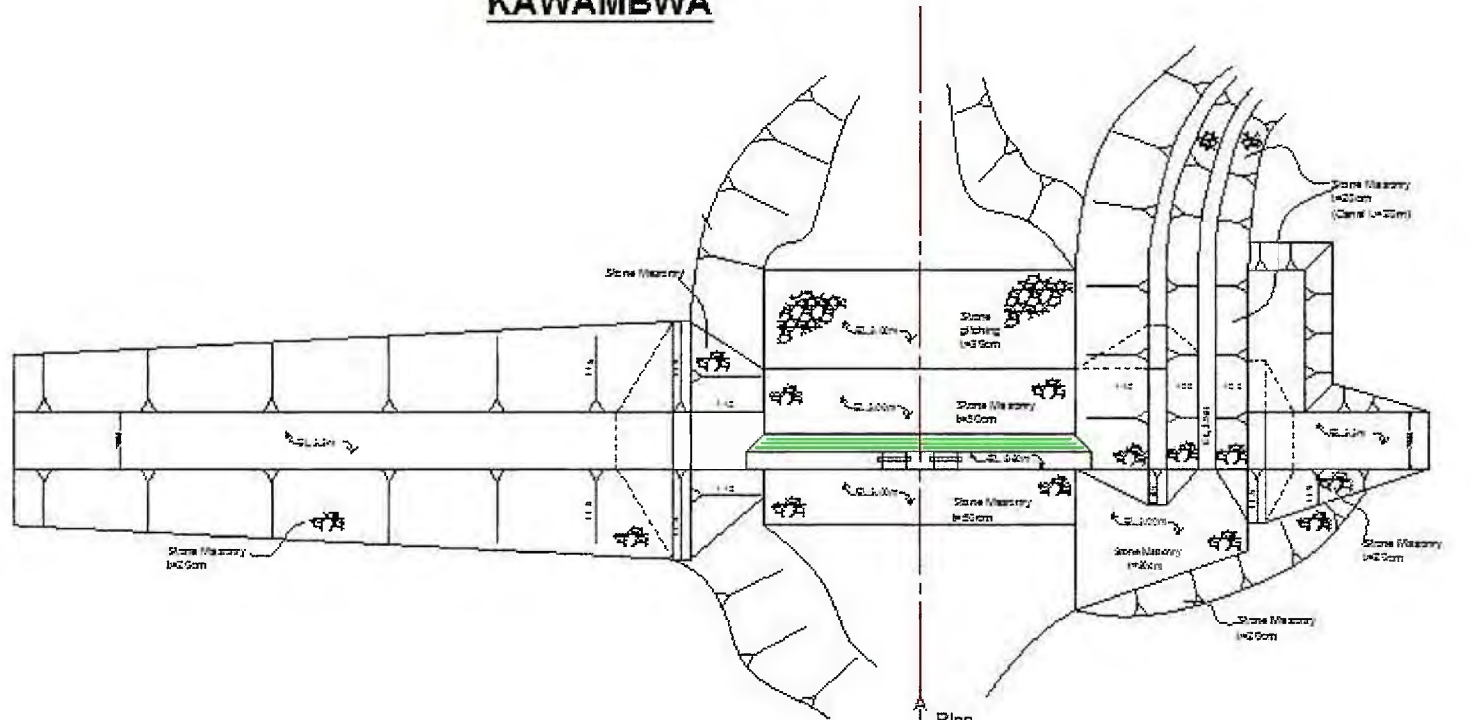


Section A
1:100



Section B

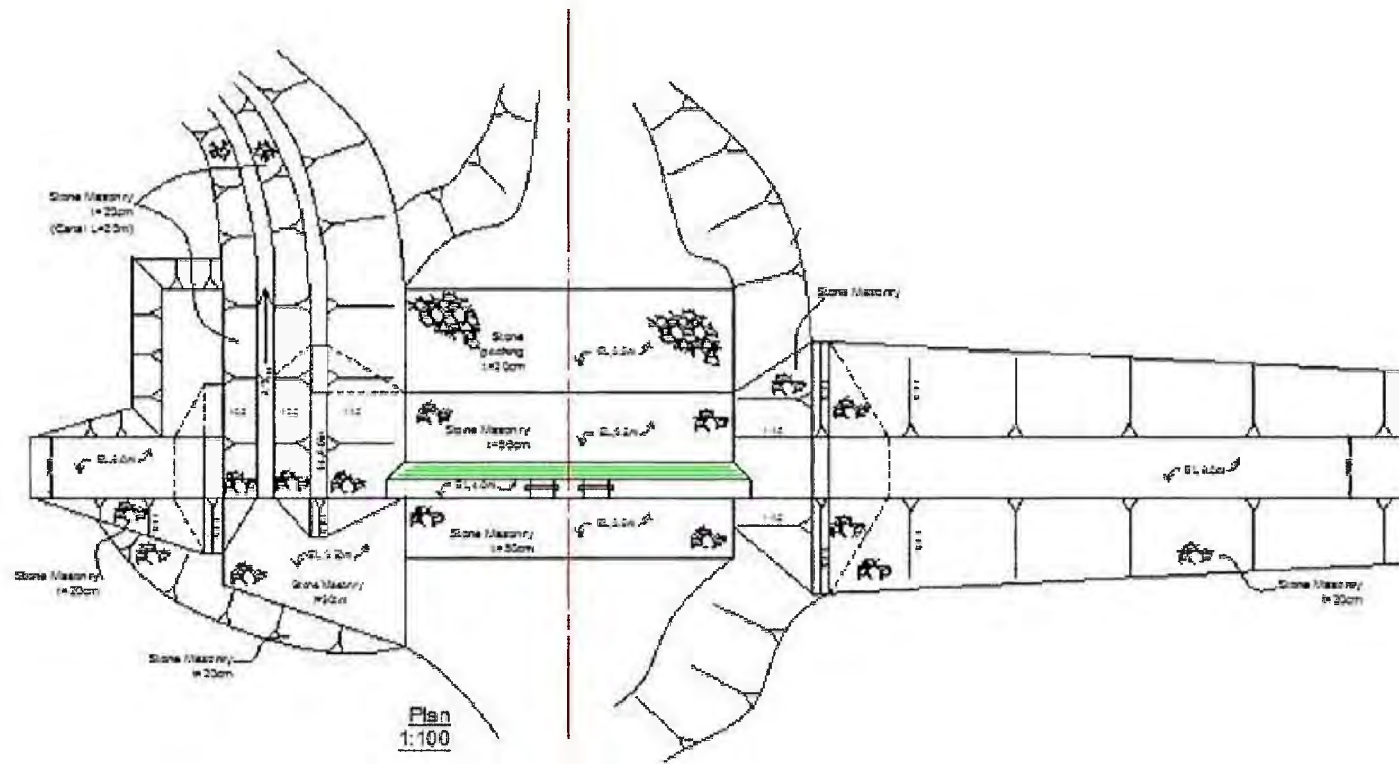
CHANSAMALAMBA KAWAMBWA



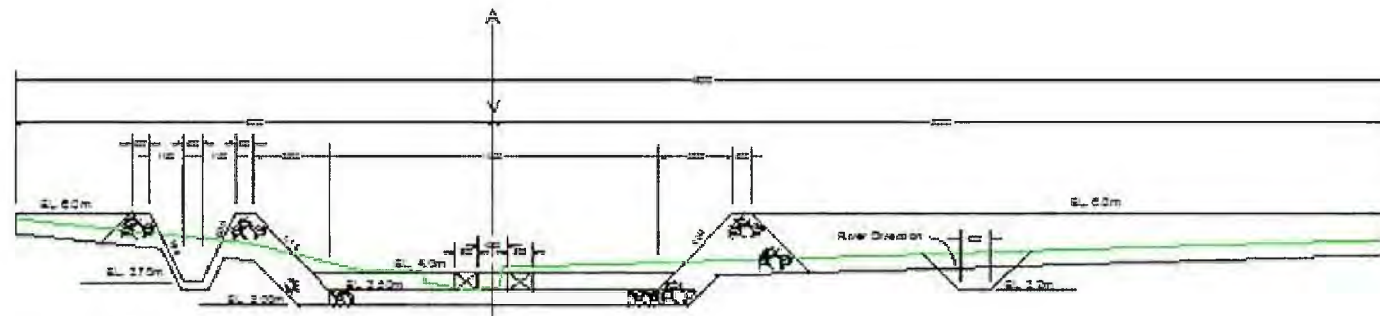
AP-II-D-37

PROJECT	
CLIENT	MOOSE JICA
DESIGNED	
DRAWN	SAIHO MITSUKI TRUSS
SCALE	1:100
DATE	24/09/2015

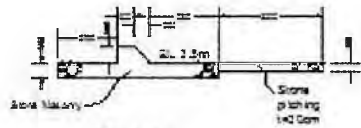
KALILA, MANSA



Plan
1:100



Longitudinal Section
1:100



Section A
1:100

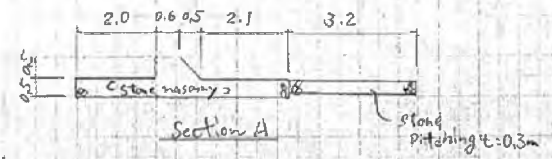
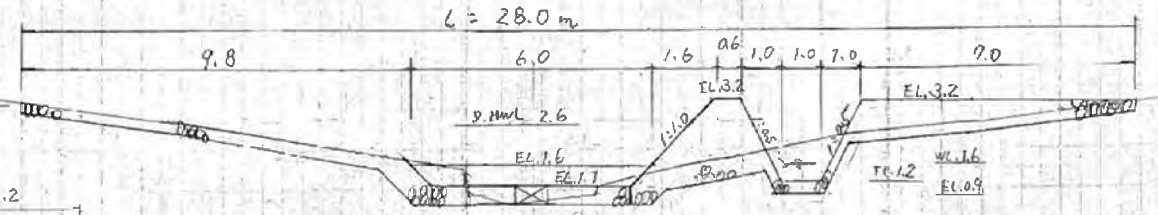
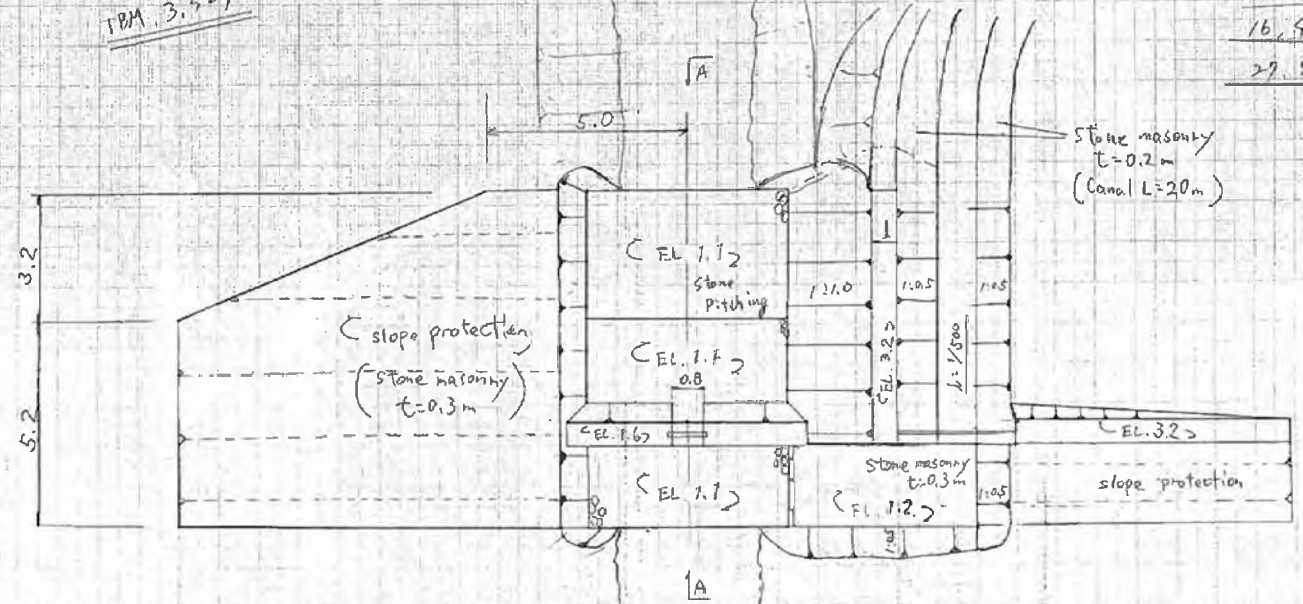
MP-II-D-39

PROJECT	
CLIENT	FEDDES JICA
DESIGNED	
DRAWN	DAVID MURUKA TEMBO
SCALE	1:100
DATE	24/05/2014

Fitungula, CHIPILI

5. 2, 2015
 16. 4, 2016
 27. 8, 2016

BM (3.32)



$A_n = 55 m^2$
 $A_n d = 5.8 \times 1.2 = 70.4$

to 12% to 15%

AP-II-D-41

PROGRESS SCHEDULE CHP Fitungulu (6th January - 10th August)

Work Description	Quantity/unit		2015																																
			April							May							June							July							August				
			10	20	30	10	20	30	10	20	30	10	20	30	10	20	30	10	20	30	10	20	30	10	20	30	10	20	30	10	20	30			
Preparation Work																																			
Site clearing	1	LS	5.0	day																															
Gathering stones	94.4	m ³	5.0	day																															
Gathering sand	36.3	m ³	3.2	day																															
Preparation of tools	1	LS	1.0	day																															
Temporary Work																																			
Preparation of access road	1	LS	5.0	day																															
Preparation of temporary stock yard	1	LS	1.0	day																															
Excavation of Apron	50.4	m ²	3.4	day																															
Excavation of Abutment	30.0	m ³	2.0	day																															
Excavation of Slope protection (L)	15.6	m ³	1.1	day																															
Excavation of Slope protection (R)	1.7	m ³	0.1	day																															
Excavation of River diversion	102.1	m ³	7.0	day																															
Construction of coffer dam	1	LS	2.0	day																															
Stone masonry																																			
Apron	13.0	m ³	13.7	day																															
Weir	2.6	m ³	2.7	day																															
Abutment	25.9	m ³	27.2	day																															
Canal	22.0	m ³	23.1	day																															
Slope protection (L)	17.6	m ³	18.5	day																															
Slope protection (R)	1.5	m ³	1.6	day																															
Mortar mixing	45.4	m ³	39.8	day																															
River bed protection	4.8	m ³	1.6	day																															
Weekly Meeting																																			
supervision by CEO, TSB																																			
Supervision by JICA Expert																																			
Foreman																																			
Skilled Labor																																			
Unskilled Labor																																			
Total																																			

Stone masonry work
1 set
6 unskilled labor
1 skilled labor
4 helper

Mortar mixing
6 unskilled labor

AP-II-D-42



Republic of Zambia

Ministry of Agriculture

SMALLHOLDER PRODUCTIVITY PROMOTION
PROGRAMME (3SP)

Design Report for Chilemba Permanent Weir in
Kasama District

FEBRUARY 2017

COMPILED BY:

TECHNICAL SERVICE BRANCH

Location Map

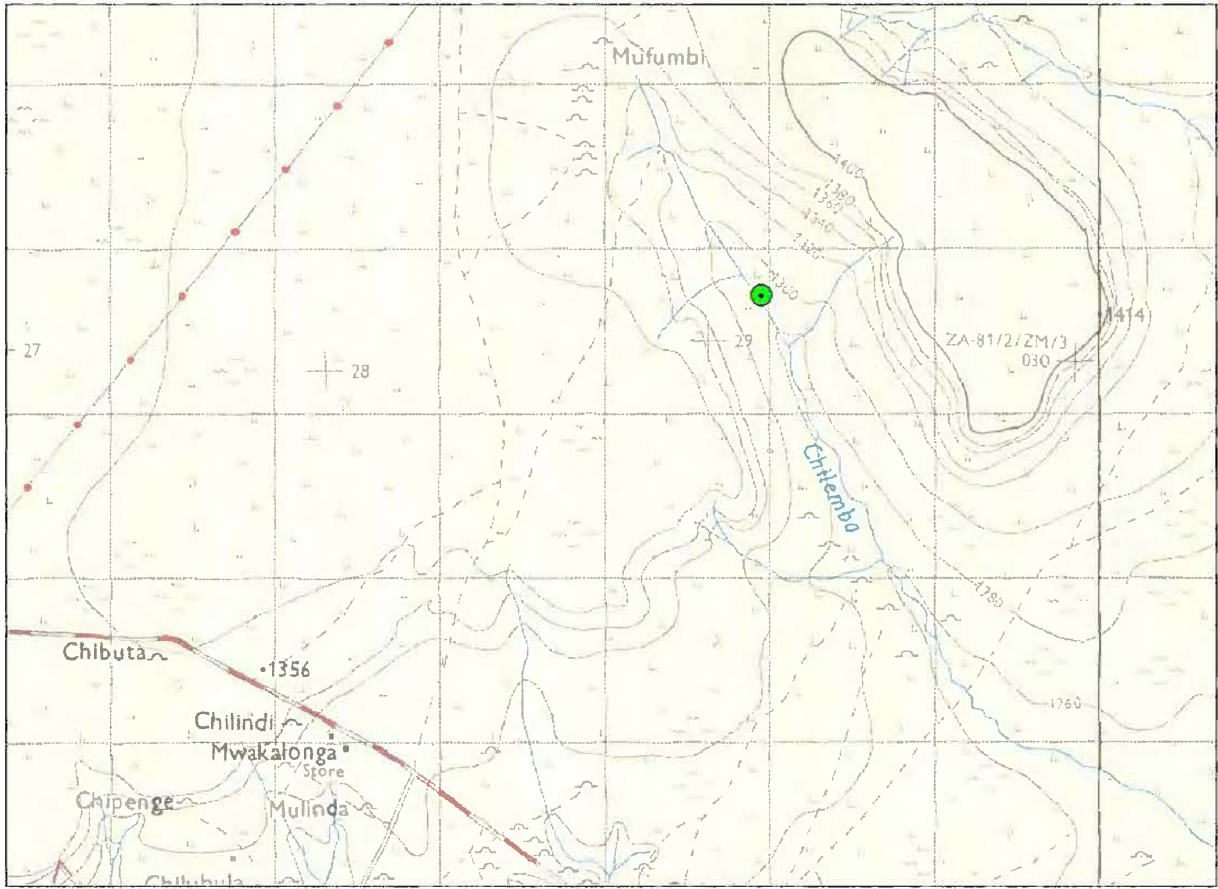


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2. Design Concept	AP- II -E-1
3. Site Condition.....	AP- II -E-1
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3.2 Socio-economic Conditions.....	AP- II -E-2
3.3 Farming and Cultivation Conditions.....	AP- II -E-2
3.4 Construction Conditions.....	AP- II -E-3
3.5 Other Conditions	AP- II -E-4
4. Design of the Weir.....	AP- II -E-4
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4.2 Determination of Various Elevations.....	AP- II -E-6
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Attachment 1 Irrigation Water Requirement

Attachment 2 Drawings

Attachment 3 Bill of Quantity

1. Objectives of the project

Permanent-diversion-weir irrigation scheme is introduced based on the concept that weir structure is upgraded to be stone masonry structure where existing simple weir irrigation scheme is well functioning and well maintained by the users so that upgraded irrigation system can be more sustainable. Under this concept, Chilemba scheme were selected to be upgraded from the existing simple weir irrigation schemes that had been constructed during and after the pilot project of the COBSI Study and during T-COBSI. Objectives of the project are to reduce maintenance work of weir and to realize the maximum utilization of water source that enables extension of irrigated area. It is expected that agriculture production and income will increase in the scheme.

2. Design Concept

In this project, diversion weir with permanent structure, made of stones and mortar, is constructed. As it is a smallholder irrigation development, the type of weirs should be something that can be constructed with farmers' participation, not by the contractor, and then manageable by the farmers for operation and maintenance.

The type of weir shall be fixed type weir that does not require sophisticated operation. The weir body, apron, spillway and intake are made of stone masonry that can be constructed by some skilled labors and unskilled labors from the farmers. The weir should discharge flood water safely, therefore, spillway which has enough capacity should be equipped. Stop-logs shall be provided for maintenance work. The volume of stone masonry shall be less than the volume that can be constructed within one dry season.

3. Site Condition

The site consists of medium clay soil, few forest trees away from the traditional believe and it's easily accessed. It's about 3 km from the main road.

3.1 Natural Conditions

(1) Meteorological Conditions

Chilemba scheme is located in Lukulu North camp in Kasama district and at 47 km from the district offices Latitude isS, longitude is E and altitude ism. Meteorological data are available in this area that of Kasama location is adopted.

(2) River Condition.

Water source of scheme is chilemba stream, and it is a perennial stream. Stream center line is stable because of sand on the base. The slope of the stream is gentle and less sediment.

Water flow quantity is estimated 200 lit/s (Dec. 8, 2015) and .400 lit/s (May, 2016). Monthly flow quantity is estimated as follows;

Table 3.2 Estimated Monthly Flow Quantity (lit/s)

May	June	July	August	September	October	November	December
400	370	340	310	280	250	220	200

Rising up the water level by constructing the weir does not affect upstream area.

There are few trees along the stream.

(3) Foundation

River bed material is rocky and gravel. Both Right side slope and left side slope contains clay soil.

3.2 Socio-economic Conditions

(1) Scheme

Describe name of village, total population, number of households, number of scheme member (men, women), income structure, major economic activities, etc. Operation and maintenance of irrigation system.

Scheme

Name of village	Total population	Number of household	Number of scheme member	
			men	women
Chilemba	275	40	35	55

Describe name of farmers group, activity, member fee, etc.

Name of scheme committee members.

Position	Name	Contact No.
Chairman	Mr Kambole	0979529339
Secretary		

Future plan for expansion.

(2) Water Usage

Describe water usage in the scheme; domestic, irrigation, fish ponds, etc.

The water will be used for irrigation and for fish ponds.

Describe water usage; upstream 1 km irrigation, 2km, downstream irrigation

Water right:

At downstream, at upstream.

Water right of Chilemba -not registered

- The water from the scheme shall be used for irrigation purpose
- fish ponds
- drinking
- washing

(3) Problems and Issues

Inadequate water during dry season due to seepage in the canal.

3.3 Farming and Cultivation Conditions

(1) Cropping pattern

Table 3.3 Current Cropping Pattern (20XX)

Crop name	Area planted (lima)	Planting date	Harvesting date
Carrots	2	01/07	
Chinese cabbage	1	12/07	
Green maize	3	05/07	
Tomatoes	2	04/08	
Cabbage	2	12/08	

Onions	1	02/09	
Rape	1	10/09	
Bondwe	1	04/09	
TOTAL	13		

Table 3.4 Planned Cropping Pattern

Crop name	Area planted (lima)	Planting date	Harvesting date
Onion	6	01/04	
Green Maize	3	06/04	
Tomato	5	10/04	
Cabbage	4	15/04	
Rape	6	25/4	
Total Area	24		

Table 3.4 SOIL DATA

Soil name	Medium (clay)	
Total available soil moisture(FC-WP)	290	mm/meter
Maximum rain infiltration rate	40	Mm/day
Maximum rooting depth	60	Centimeters
Initial soil moisture depletion(as %TAM)	0	%
Initial available soil moisture	290	Mm/meter

Number of fish ponds.

There are no fish ponds, but ones the permanent weir is constructed they will be set up

Number of livestock

The total number of livestock (goats) is 700.

(2) Cultivation Technology

Irrigation method, rule (rotation, gravity irrigation, companion cropping and on farm irrigation etc.)

(3) Market

There are two markets and these are Chilubula, chikumanino, Chambeshi and TAZARA market.

Major market.

Chilubula

(4) Problems and issues

Any problems and issues on farming.

3.4 Construction Conditions

(1) Availability of labor

18Men/day 10 Women/day

No Skilled labour

Working hour: 08:00 hours to 15:00 hours

No working day: 5 Saturday, Sunday and holidays.

(2) Availability of material

Stones: 500m from the site, free of charge

Sand: 5 km from the site, price/tonne-K300.00

Access to the site: road condition, bridge, etc.

The site is easily accessed by road.

(3) Any special condition

There is no special condition. 3.5 Other Conditions

(1) Related Projects

In order to establish the design and the construction plan, examine whether there are any other development projects, including those under planning.

If there are any, investigate the features of their plan and design, the route selection, the structure, the construction year, and the conditions at the time of construction.

Currently there are no developmental projects.

4. Design of the Weir

4.1 Design High Water Level

Design high water level is determined according to following procedure.

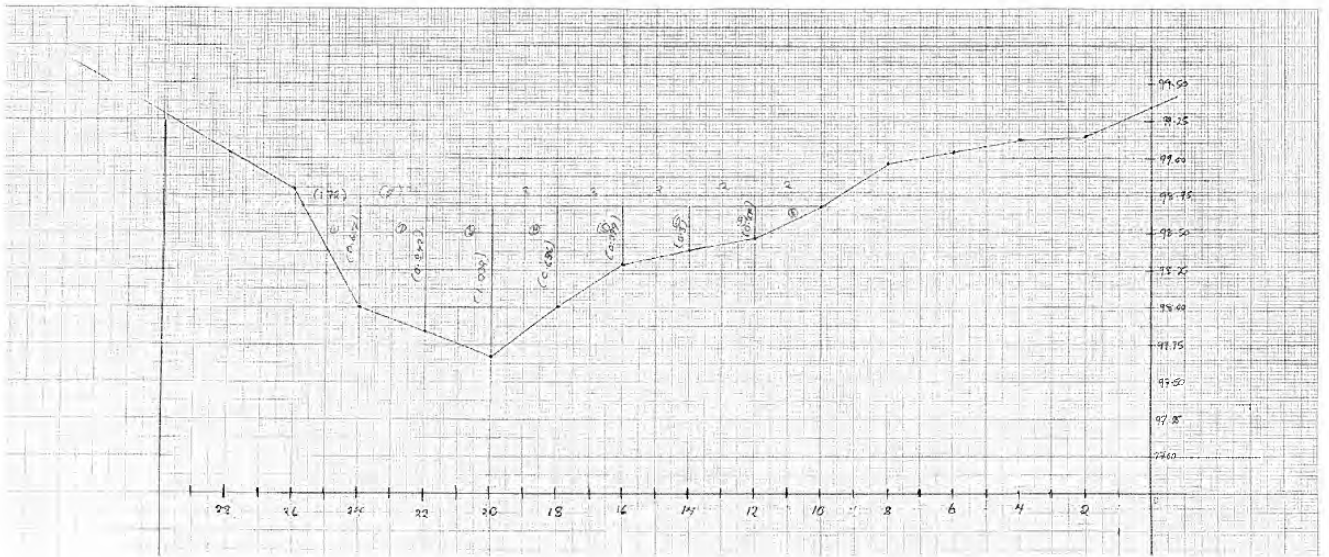
- ① Draw cross section of river at the weir center line
- ② Put high water level in the drawing
- ③ Calculate the flow water area at the high water level : Ah
- ④ Decide intake water level (spillway crest level) : IWL
Crest level of spillway = existing intake water level + 0.1 ~ 0.2m
- ⑤ Decide the width of spillway \doteq Width of existing river
- ⑥ Decide design flow water area at the high water level: Ahd > Ah x 1.2 (20% margin)
- ⑦ Decide the design high water level
- ⑧ Decide the weir crest level = DHWL + 0.6m

(1) Calculation of Ah

- ① $(25.75 - 24) \times (98.675 - 98.00) / 2 = 0.565$
- ② $\{(98.675 - 98.00) + (98.675 - 97.825)\} / 2 \times (24 - 22) = 1.499$
- ③ $\{(98.675 - 97.825) + (98.675 - 97.675)\} / 2 \times (22 - 20) = 1.844$
- ④ $\{(98.675 - 97.675) + (98.675 - 98.00)\} / 2 \times (20 - 18) = 1.638$
- ⑤ $\{(98.675 - 98.00) + (98.675 - 98.3)\} / 2 \times (18 - 16) = 1.016$
- ⑥ $\{(98.675 - 98.3) + (98.675 - 98.375)\} / 2 \times (16 - 14) = 0.679$
- ⑦ $(98.675 - 98.375) + (98.675 - 98.45) / 2 \times (14 - 12) = 0.504$
- ⑧ $(12 - 10) \times (98.675 - 98.45) / 2 = 0.204$

$$Ah = 0.565 + 1.499 + 1.844 + 1.638 + 1.016 + 0.679 + 0.504 + 0.204 = 7.948 \text{ m}^2$$

$$\text{Required area} = 7.948 \times 1.2 = 7.948 \text{ m}^2$$



(2) Calculation of Spillway

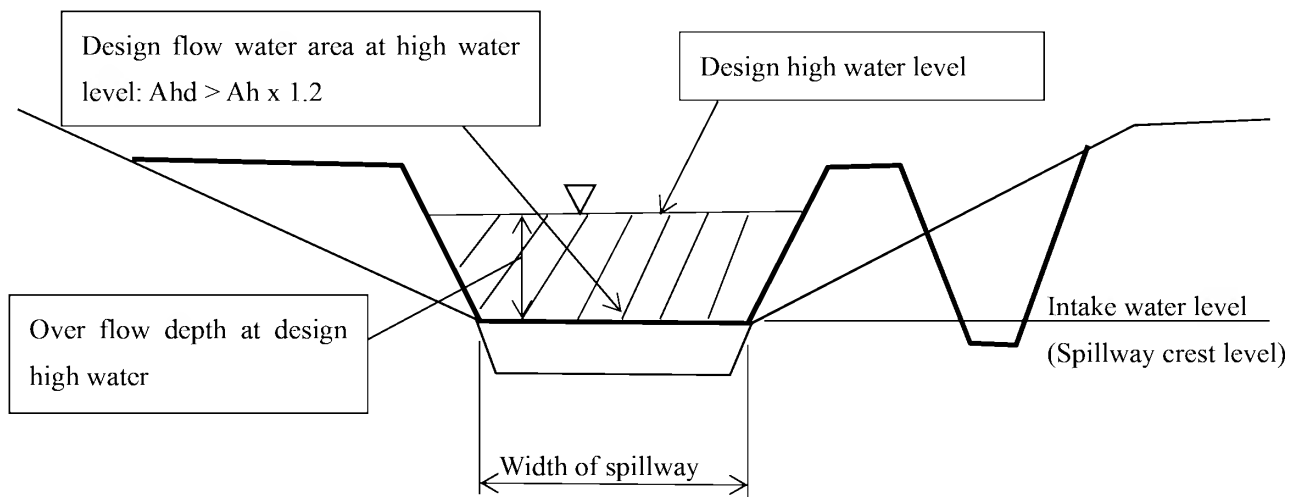


Figure 4.2 Design Flow Area

Width of existing stream is 6 to 14 m.

Table 4.1 Calculation of Spillway Flow area

W (m)	D (m)	A (m ²)
8.00	1.00	9.00
8.00	1.10	10.01
8.00	1.20	11.04
9.00	1.00	10.00
9.00	1.10	11.11
10.00	0.90	9.81
10.00	1.10	12.21
11.00	0.80	9.44
11.00	0.90	10.71
11.00	1.00	12.00

According to the table above, width of spillway is 9 m.

Existing water level: EL. 98.3 m

Intake water level: EL. 98.50 m

Spillway crest level: EL. 98.50 m

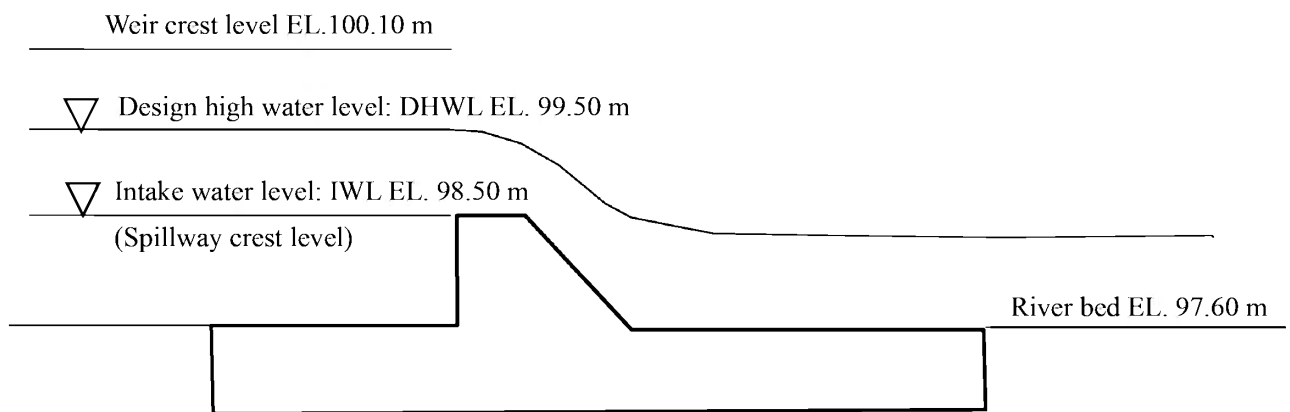
Design High Water Level = EL. 98.50 + 1.00 = EL.99.50 m

Weir crest level = EL.99.50 + 0.6 = EL. 100.10 m

4.2 Determination of Various Elevations

- River bed: Actual elevation based on the survey = EL. 97.60 m
- Intake water level (IWL) = existing water level + 0.1 = EL. 98.50 m
- Spillway crest elevation: = IWL = EL. 98.50 m
- Design high water level (DHWL): spillway crest elevation + overflow depth 1.0m = EL. 99.50 m
- Main weir crest elevation: DHWL + 0.6m = EL.100.10 m
- Intake bottom elevation: spillway crest elevation – 0.4 > riverbed + 0.2 = EL. 98.10 m

Figure 4.3 Various Elevations



4.3 Length of Apron

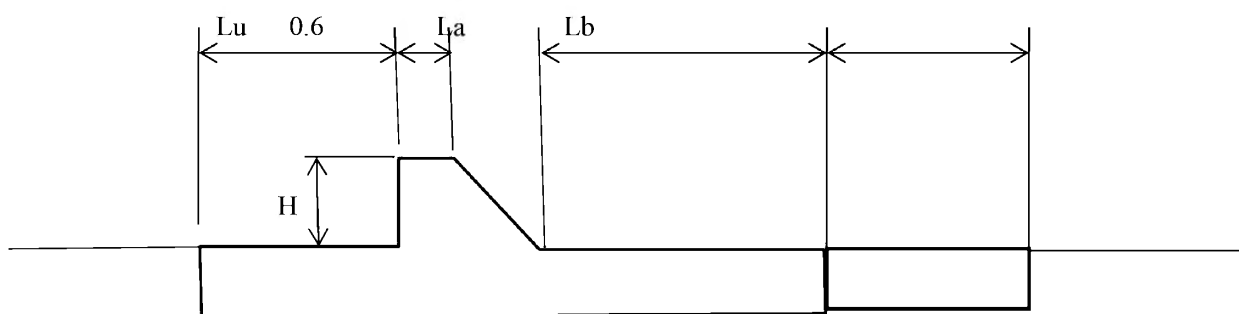


Figure 4.4 Length of Apron.

Recommended length of apron is showed in the Table 4.2

H = 0.9m, Medium clay

Therefore, La = 2.9 m. Lb = 4.3 m, Lu = 2.0m (standard)

Table 4.2 Recommended length of apron

Foundation	H (m)	La (m)	Lb (m)	L (m)
Medium clay	0.6	2.3	3.5	5.8
Medium clay	0.8	2.7	4.0	6.7
Medium clay	1.0	3.0	4.5	7.5
Sandy soil	0.6	5.6	8.3	13.9
Sandy soil	0.8	6.4	9.7	16.1
Sandy soil	1.0	7.2	10.8	18.0

4.4 Various Dimension

(1) Intake

- Bottom width of intake

Bottom width of intake is decided to meet to required discharge capacity.

Beneficiary area is estimated 30 ha. However, stream water flow is about 750 lit/s (December, 2016).

Width of existing furrow is about 0.5 m.

Considering these conditions,

Bottom width: 1.0 m

Intake water depth: 0.4 m

According to Table 4.3, capacity of intake is 350 lit/s, velocity 0.72 m/s

Table 4.3 Main Canal Hydraulic Analysis

Bottom Width = 1.0m, I = 0.002, n = 0.025							
Q (m ³ /s)	V (m/s)	A (m ²)	P (m)	R (m)	Water Depth (m)	Freeboard (m)	Canal Height (m)
0.200	0.6109	0.327	1.640	0.200	0.2864	0.114	0.400
0.225	0.6330	0.355	1.689	0.210	0.3080	0.192	0.500
0.250	0.6532	0.383	1.735	0.221	0.3288	0.171	0.500
0.275	0.6717	0.409	1.780	0.230	0.3487	0.151	0.500
0.300	0.6889	0.436	1.823	0.239	0.3679	0.132	0.500
0.325	0.7049	0.461	1.864	0.247	0.3864	0.114	0.500
0.350	0.7199	0.486	1.904	0.255	0.4044	0.196	0.600
0.375	0.7341	0.511	1.943	0.263	0.4219	0.178	0.600
0.400	0.7475	0.535	1.981	0.270	0.4389	0.161	0.600
0.450	0.7723	0.583	2.055	0.284	0.4716	0.128	0.600
0.500	0.7948	0.629	2.124	0.296	0.5027	0.197	0.700

- Slope of side wall shall be 1 : 0.5
- Slope of intake canal (hydraulic gradient) : 1/500
- Thickness of stone masonry lining : minimum 20cm
- Width of top of intake : minimum 60cm

(2) Main Weir

- Width of crest of overflow section : 60cm (minimum)
- Width of crest of non-overflow section : 60cm (minimum)
- Downstream slope of weir : 1 : 1 (standard cross section)
- Upstream face of weir : vertical (standard cross section)

- Width of stop-log : 80cm (maximum)
- Thickness of apron : minimum 50cm (soil foundation)
- Thickness of slope protection: 30cm (minimum)
- Setting Depth of main weir : minimum 50cm (soil foundation)

4.5 Specifications

Table 4.4 Specification of Weir

No.	
Name of scheme	Chilemba
Province	Northern
District	Kasama
No. of members	
Present irrigated area (ha)	3.25
Scheme area (ha)	>10
Type of weir	Fixed type stone masonry with stop log.
Total length of weir	36.9 m
Height of weir	2.5 m
Spillway	W= 9.0m Design flow depth: 1.0m Stop log: W = 0.8m x 1
Top Elevation*1	EL.100.10 m
Over flow crest elevation*1	EL.98.50 m
Intake	Left side Trapezoid Bottom width: 1.0 m Bottom elevation : EL.98.1 m
Design discharge (lit/s)*2	344
Maximum irrigable area (ha)*3	25.9

*1 relative elevation

*2 design discharge > actual river flow

*3 design capacity

5. Work Plan

(1) Bill of Quantity

Detailed bill of quantity and manpower plan is shown in attachment 3. Table 5.1 shows summary of bill of quantity.

Table 5.1 Summary of Bill of Quantity

Item	Specification/Quality	Unit	Quantity
Excavation		m ³	169
Back filling/Embankment		m ³	23.4
Stone masonry		m ³	171.85
Stone pitching		m ³	10.97
Rubble stone	10cm – 30cm	m ³	196.96
Mortar		m ³	94.52
Sand		m ³	85.06
Cement	Ordinary portland	Bags	850.65
Stop-log	Plank	m ²	4.77
Stop-log	Timber 50 x 50	m	15.4
Stop-log frame	[- 40 x 75, D12	L.S.	1

(2) Manpower Plan and Work Schedule

Required manpower is calculated based on required quantity. According to required manpower and manpower plan, work period is estimated.

Table 5.2 shows summary of required manpower and work period.

Table 5.2 Summary of manpower plan

Item	Quantity	Unit	man· day	man/day	Net period (day)	Gross period (Net x 2.0 day)
Excavation	196	m ³	152.8	30	5.1	10.2
Back filling/embankment	23.4	m ³	17.8	30	0.6	1.0
Stone masonry	171.85	m ³	773.3	12	64.4	128.8
Mortar mixing	94.52	m ³	425.34	12	35.4	70.9
Stone pitching	10.97	m ³	21.9	20	1.1	2.2

Work schedule is shown in attachment 3.

(3) Cost Estimation

Summary of construction cost is shown in Table 5.3

Table 5.3 Summary of Construction Cost

Item	specification	quantity	unit	unit price	price
rubble stone		196.56	m ³	0.0	0
sand		85.06	m ³	0.0	0
cement	ordinary portland	851	bag	75.0	63,825
Plank	25x200x5,500	5	pc	70	300
Timber	50x50x5,500	4	pc	22.5	90
Stop-log frame		1	L.S.	3,500	3,500
Total material cost					67,715.0
Tools		1	L.S.		15,000
Transportation	Cement	5	trips	2,000	10,000
	Sand	22	trips	800	17600
	Stones	50	trips	800	40000
	Tools	1	trip	1,500	1,500
Transportation total					
foreman		51.6	man	0.0	0
skilled labor		103.1	man	100.0	10310.7
unskilled labor		1776.9	man	30.0	53305.7
Total labor cost					
Total Construction Cost					147716.4
Cost for S/V					
	Fuel	1850	litre	10.72	19832.00
	MA	105	day	85.00	8925.00
Total Project Cost					244238.5

Attachment Irrigation Water Requirement

1. Irrigation Water Requirement

1.1. General conditions

(1) Irrigation water requirement of each scheme

Irrigation water requirement of each scheme is calculated with FAO-CROPWAT.

1) Meteorological data

Meteorological data of FAO-CLIMWAT is used for CROPWAT.

2) Cropping pattern

Cropping patterns are based on inventory survey and interview to the farmers.

3) Effective rainfall

A number of empirically determined formulae can be used. They have been developed under a given set of conditions which may be very different from those under which they are to be applied. Their use elsewhere therefore remains doubtful.

According to FAO-CROPWAT, "In general, the efficiency of rainfall will decrease with increasing rainfall. For most rainfall values below 100 mm/month, the efficiency will be approximately 80%. Unless more detailed information for local conditions, it is suggested to select the Option "Fixed percentage" and give 80% as requested value".

In Northern, Luapula and Muchinga district, monthly precipitation in the dry season is less than 100 mm. Therefore, in this study, 80% is given as rainfall efficiency.

4) Irrigation efficiency

Irrigation efficiency is calculated by following formula:

$$E_p = E_a \times E_b \times E_c$$

Irrigation efficiency E_p

Conveyance efficiency E_c : ratio of quantity of water at inlet of a block of field / intake water at source

Field canal efficiency E_b : ratio of quantity of water at field inlet / a block of field

Application efficiency E_a : ratio of quantity of water directory available to the crop / field inlet

Distribution efficiency $E_d = E_c \times E_b$

Field efficiency $E_f = E_b \times E_a$

Table 1 shows values determined by international institutes.

According to the table below, following coefficients are adopted in this study.

$$E_d = 0.3, E_a = 0.6$$

$$E_p = 0.3 \times 0.6 = 0.18$$

Table 1 Ec, Eb, Ed, and Ea

Conveyance Efficiency (Ec)		ICID/ILRI
Continuous supply with no substantial change in flow		0.9
Rotational supply in projects of 3,000 – 7,000 ha and rotation areas of 70 – 300 ha, with efficient management		0.8
Rotational supply in large schemes (>10,000ha) and small schemes (<1,000 ha) with respective problematic communication and less effective management:		
Based on predetermined schedule		<u>0.7</u>
Based on advance request		0.65
Field Canal Efficiency (Eb)		
Blocks larger than 20 ha: unlined		0.8
lined or piped		0.9
Blocks up to 20 ha: unlined		<u>0.7</u>
lined or piped		0.8
Distribution efficiency (Ed = Eb x Ec)		
Average for rotational supply with management and Communication adequate		0.65
sufficient		0.55
insufficient		0.40
poor		0.30
Field Application Efficiency (Ea)	USDA	USSCS
Surface methods		
Light soils	0.55	
Medium soils	0.70	
Heavy soils	0.60	
Graded border		0.60-0.75
Basin and level border		0.60-0.80
Contour ditch		0.50-0.55
furrow		<u>0.55-0.70</u>
corrugation		0.50-0.70
Subsurface		Up to 0.80
Sprinkler, hot dry climate		0.60
Moderate climate		0.70
Humid and cool		0.80
Rice		0.32

ICID: International Committee of Irrigation and Drainage

ILRI: International Institute for Land Reclamation and Improvement

USDA: United States Department of Agriculture

USSCS: United States Soil Conservation Service

1.2 Cropping Calendar

(1) Standard days to maturity (Crop Production Recommendations for Northern and Muchinga Province, RESCAP, FAO Irrigation and Drainage Paper No.56)

Standard days to maturity varies depending on variety. In this project, following table is adopted.

Crop	Days to maturity (RESCAP/FAO*)	Adopted
Green Maize (Medium maturity)	120 - 142	130
Green Maize (Early maturity)	105 - 115	110
Common Beans	75 - 85	80
Soya Bean	110 - 130	120
Groundnuts	110 - 145	130
Sweet Potato	105	105
Irish Potato	115 - 140	125
Tomato (cold season)	106 - 109	110
Chinese Cabbage	60	60
Cabbage	100 - 110	110
Onion	150*	150
Impwa (egg plant)	130*	130
Okura	-	90
Rape	60	60
Vegetable	-	60

One crop is not planted always at once in the scheme. Some farmers start planting in April and harvesting in August and some start planting in May and harvesting in September.

In that case, for CROPWAT data, planting in April and harvesting in September is adopted.

(2) Cropping Pattern

Cropping pattern of the scheme is shown in following table. This cropping pattern is based on interview to the farmers. Future cropping pattern will be modified to be more effective

Table 2. Cropping Calendar

Crop	Area (ha)	%	Months													
			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	
Carrot	2	15														
Green Maize	3	23														
Chinese Cabbage	1	8														
Tomato	2	15														
Cabbage	2	15														
Onion	1	8														
Bondwe	1	8														
Rape	1	8														
TOTALS	13	100														

1.3 Result of Calculation

Result of calculation of irrigation water requirement is shown in **Table 3**.

Table 3

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Precipitation deficit												
1. Carrot Chilemba	0	0	0	0	0	0	100.3	150.1	189.8	176.9	10.4	0
2. Green Maize Chilemba	0	0	0	0	0	0	40	146.5	216.4	181.9	1.8	0
3. C Cabbage Chilemba	0	0	0	0	0	0	66.1	171.4	84.3	0	0	0
4. Tomato Chilemba	0	0	0	0	0	0	0	90.2	142.3	198.7	49	0
5. Cabbage Chilemba	0	0	0	0	0	0	0	76.9	129	147	32.6	0
6. Onion Chilemba	0	0	0	0	0	0	0	0	125.1	156.2	38.7	0
7. Bondwe Chilemba	0	0	0	0	0	0	0	0	120.5	177.9	45.2	0
8. Rape Chilemba	0	0	0	0	0	0	0	0	93	186.2	26.2	0
Net scheme irr.req.												
in mm/day	0	0	0	0	0	0	1	3.1	5.1	5.2	0.8	0
in mm/month	0	0	0	0	0	0	29.5	95	152.8	161.9	23	0
in l/s/ha	0	0	0	0	0	0	0.11	0.35	0.59	0.6	0.09	0
Irrigated area (% of total area)	0	0	0	0	0	0	46	76	100	92	92	0
Irr.req. for actual area (l/s/ha)	0	0	0	0	0	0	0.24	0.47	0.59	0.66	0.1	0

Maximum irrigation water requirement is:

$$0.66 / 0.18 = 3.67 \text{ l/s/ha}$$

In case of 8 hours irrigation per day:

$$3.67 \times 24/8 = 11.01 \text{ l/s/ha.}$$

2. Design Discharge Capacity of Intake

The discharge of the canal is calculated using the following formula;

$$Q = A \cdot V$$

Where, Q: Discharge (m³/s)

A: Cross-section area (m²)

V: Mean velocity (m/s)

The mean velocity of an open canal is calculated according to Manning formula;

$$V = \frac{1}{n} \cdot R^{2/3} \cdot I^{1/2}$$

Where, V: Mean velocity (m/s)

I: Hydraulic gradient (canal bed slope)

R: Hydraulic radius (m)

n: Roughness coefficient

Canal bed slope is $1/500 = 0.002$, Roughness coefficient = 0.025 (rough wet stone masonry)

The result of calculation is shown in following table.

Design discharge capacity is larger than actual river water flow observed in 2016.

Table 4 result of hydraulic calculation for intake canal

Site	Bottom width (m)	Depth (m)	R (m)	I	n	V (m/s)	A m ²	Q m ³ /s
Chilemba	1.00	0.40	0.253	0.002	0.025	0.716	0.480	0.25

3. Maximum Irrigable Area

Based on irrigation water requirement and intake discharge capacity, irrigable area is decided as follows;

Table 5 Maximum Irrigable Area

Site	Current irrigated area (ha) (1)	Irrigation requirement (l/s/ha) (2)	Discharge capacity (lit/s) (3)	Maximum irrigable area (ha) (4) = (3) / (2)
Chilemba	3.25	11.01	344	25.88

Actual irrigable area depends on actual river flow quantity.

A1- Kasama, Northern Province

Table A1-1 Meteorological data of Kasama

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Max	26.3	26.8	26.8	26.5	26.0	24.9	24.9	26.9	29.8	30.9	28.9	26.7
Min	16.1	16.2	16.1	15.2	12.5	9.6	9.3	11.0	13.8	15.9	16.4	16.2
Mean	19.7	19.9	20.2	20.2	18.9	17.2	17.1	18.9	21.8	23.1	21.6	20.1

Month	Min Temp °C	Max Temp °C	Humidity %	Wind km/day	Sun hours	Rad MJ/m ² /day	ET _o mm/day
January	16.1	26.3	84	147	5.7	19	3.77
February	16.2	26.8	83	147	5.8	19.1	3.84
March	16.1	26.8	82	130	6.9	20.2	3.98
April	15.2	26.5	72	164	9.4	22.3	4.4
May	12.5	26	64	173	10.7	22.1	4.31
June	9.6	24.9	59	199	11.1	21.4	4.19
July	9.3	24.9	55	216	11.5	22.4	4.44
August	11	26.9	49	242	11.5	24.4	5.34
September	13.8	29.8	44	233	11.2	26.1	6.25
October	15.9	30.9	44	216	10.2	25.6	6.46
November	16.4	28.9	66	173	8.5	23.2	5.14
December	16.2	26.7	77	156	6.6	20.2	4.18
Average	14	27.1	65	183	9.1	22.2	4.69

	Rain mm	Eff rain mm
January	285.3	228.2
February	242.8	194.2
March	233.1	186.5
April	91.3	73
May	10.5	8.4
June	0.4	0.3
July	0.1	0.1
August	0.1	0.1
September	3	2.4
October	23.3	18.6
November	158.3	126.6
December	295	236
Total	1343.2	1074.6

Graph A1-1 Monthly Precipitation of Kasama

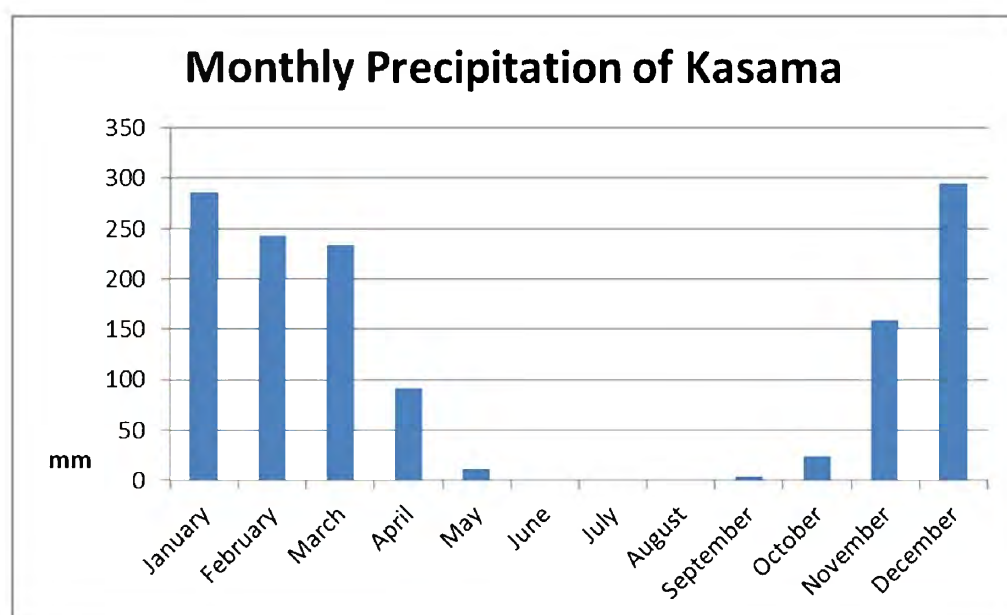


Table A1-2 Cropping pattern of the scheme.

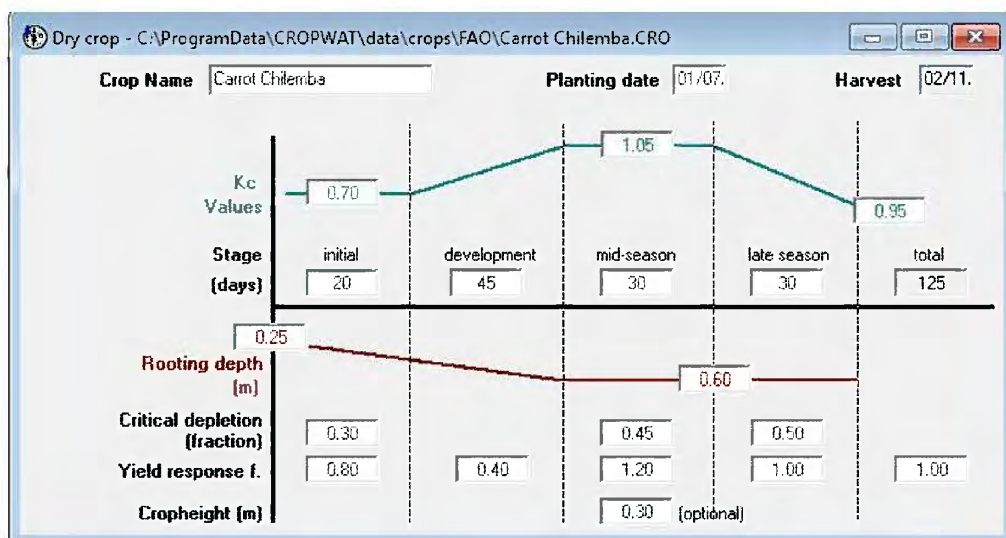
Crop name	Area planted (lima)	Planting date	Area %
Carrots	2	01/07	15
Chinese cabbage	1	12/07	8
Green maize	3	05/07	23
Tomatoes	2	04/08	15
Cabbage	2	12/08	15
Onions	1	02/09	8
Rape	1	10/09	8
Bondwe	1	04/09	8
TOTAL	13		100

Table A1-3 Soil data

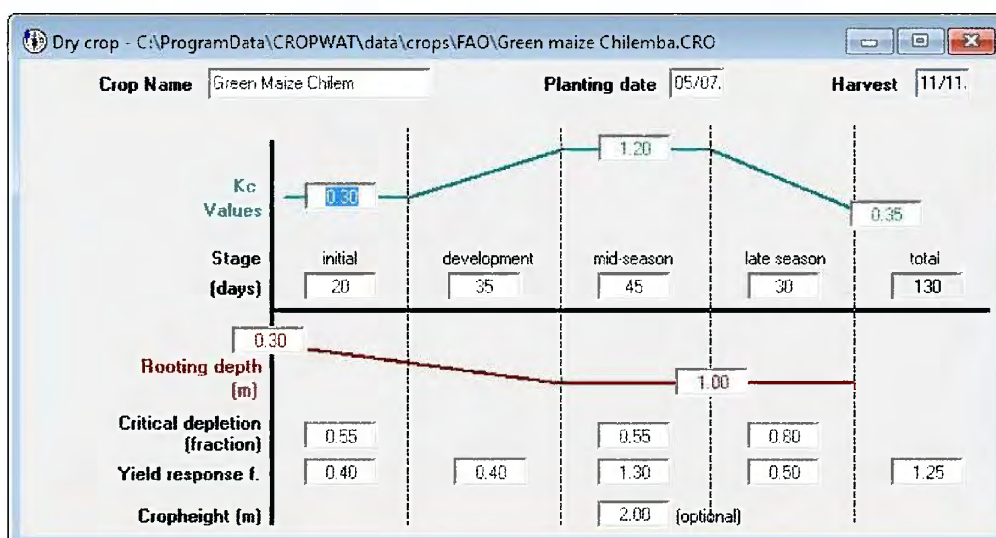
Soil name	Medium (loam)	
Total available soil moisture (FC-WP)	290	mm/meter
Maximum rain infiltration rate	40	mm/day
Maximum rooting depth	60	centimeters
Initial soil moisture depletion (as % TAM)	0	%
Initial available soil moisture	290	mm/meter

Table A1-4 Crop data

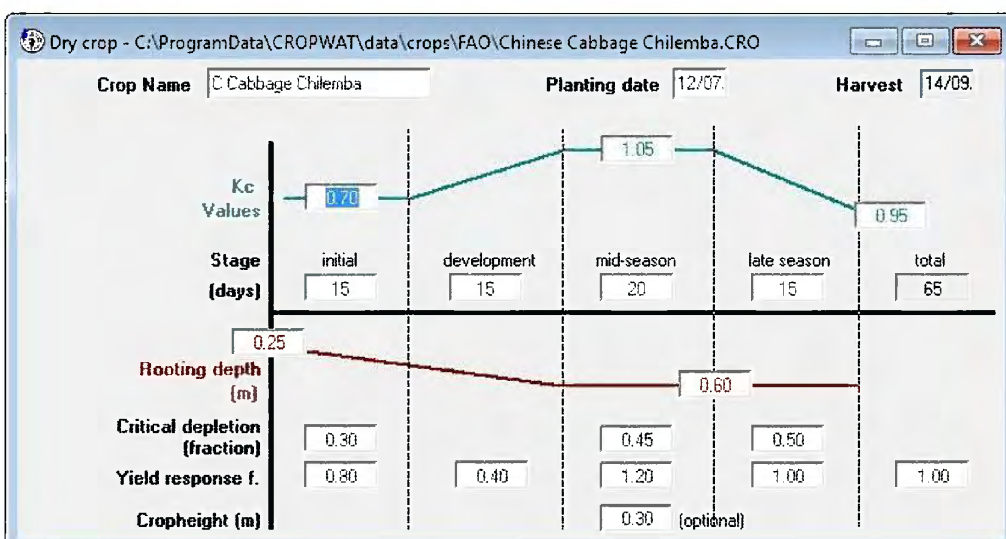
1. Carrot



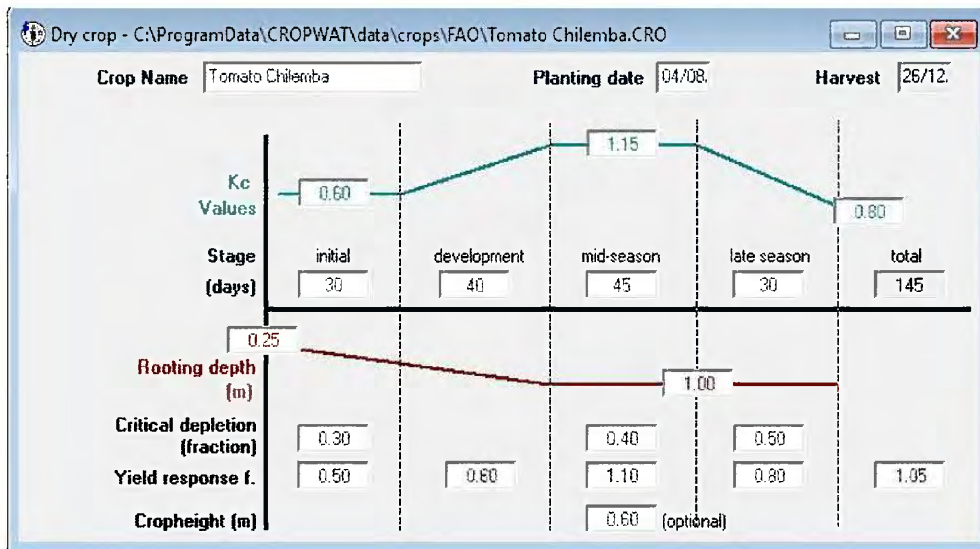
2. Green Maize



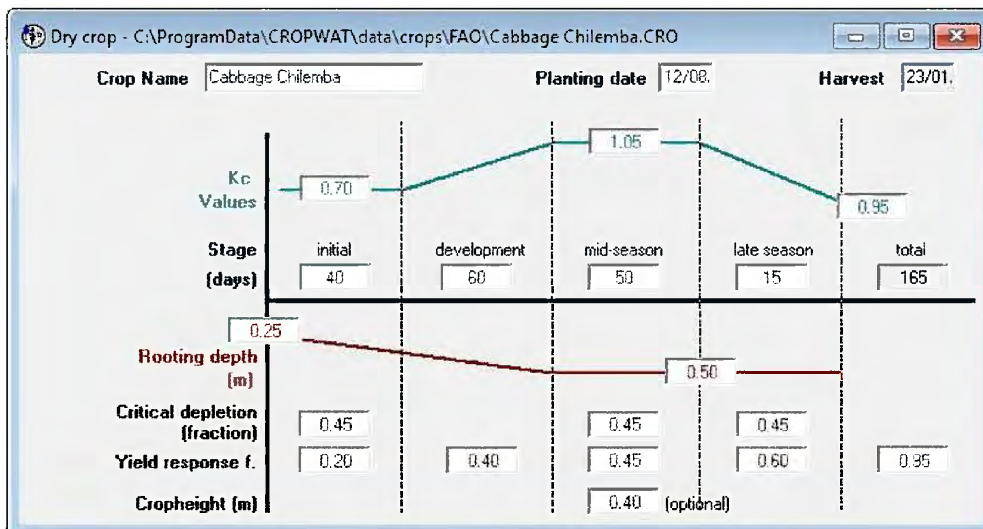
3. Chinese Cabbage



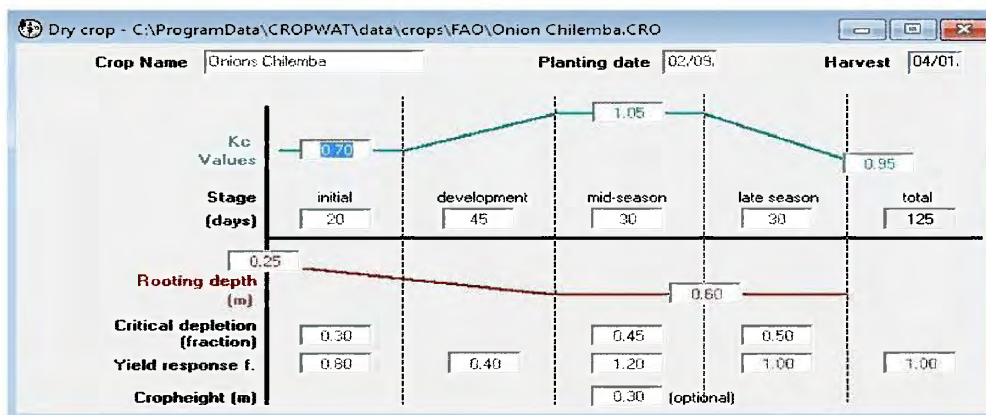
4. Tomato



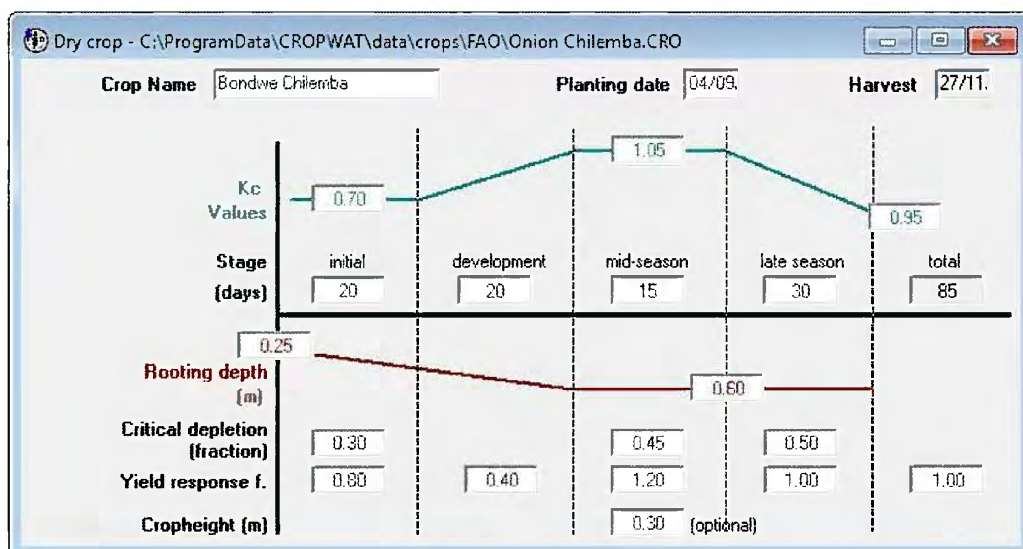
5. Cabbage



6. Onion



7. Bondwe



8. Rape

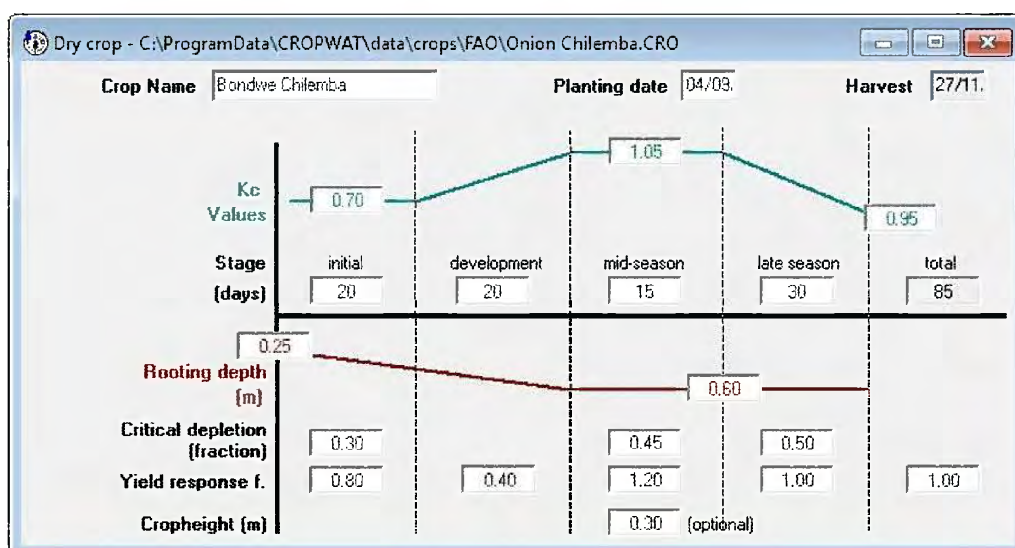


Table A1-5 Cropping pattern

No.	Crop file	Crop name	Planting date	Harvest date	Area %
1.	...PWAT\data\crops\FAO\Carrot Chilemba.CRO	Carrot Chilemba	01/07	02/11	15
2.	...data\crops\FAO\Green maize Chilemba.CRO	Green Maize Chilemba	05/07	11/11	23
3.	...a\crops\FAO\Chinese Cabbage Chilemba.CRO	C Cabbage Chilemba	12/07	14/09	8
4.	...AT\data\crops\FAO\Tomato Chilemba.CRO	Tomato Chilemba	04/08	26/12	15
5.	...T\data\crops\FAO\Cabbage Chilemba.CRO	Cabbage Chilemba	12/08	23/01	15
6.	...PWAT\data\crops\FAO\Onion Chilemba.CRO	Onion Chilemba	02/09	04/01	8
7.	...AT\data\crops\FAO\Bondwe Chilemba.CRO	Bondwe Chilemba	04/09	22/11	8
8.	...PWAT\data\crops\FAO\Rape Chilemba.CRO	Rape Chilemba	10/09	13/11	8

Table A1-6 Crop water requirement

Table A1 – 1-8 crop water requirement

1. Carrot

Month	Decade	Stage	Kc coeff	ETc mm/day	ETc mm/dec	Eff rain mm/dec	Irr. Req. mm/dec
Jul	1	Init	0.7	3.05	30.5	0.1	30.4
Jul	2	Init	0.7	3.11	31.1	0	31
Jul	3	Deve	0.75	3.55	39.1	0	39.1
Aug	1	Deve	0.84	4.22	42.2	0	42.2
Aug	2	Deve	0.92	4.92	49.2	0	49.2
Aug	3	Deve	1.01	5.7	62.7	0.2	62.5
Sep	1	Mid	1.08	6.39	63.9	0.1	63.8
Sep	2	Mid	1.08	6.74	67.4	0.2	67.2
Sep	3	Mid	1.08	6.81	68.1	2.2	65.9
Oct	1	Late	1.07	6.89	68.9	1.5	67.4
Oct	2	Late	1.03	6.77	67.7	1.9	65.8
Oct	3	Late	0.99	6.05	66.5	15.3	51.2
Nov	1	Late	0.97	5.41	10.8	6	10.8
					668.2	27.6	646.7

2. Green Maize

Month	Decade	Stage	Kc coeff	ETc mm/day	ETc mm/dec	Eff rain mm/dec	Irr. Req. mm/dec
Jul	1	Init	0.3	1.31	7.8	0	7.8
Jul	2	Init	0.3	1.33	13.3	0	13.3
Jul	3	Deve	0.37	1.75	19.2	0	19.2
Aug	1	Deve	0.64	3.21	32.1	0	32.1
Aug	2	Deve	0.91	4.85	48.5	0	48.5
Aug	3	Mid	1.18	6.64	73.1	0.2	72.9
Sep	1	Mid	1.25	7.41	74.1	0.1	74
Sep	2	Mid	1.25	7.79	77.9	0.2	77.7
Sep	3	Mid	1.25	7.88	78.8	2.2	76.6
Oct	1	Mid	1.25	8.05	80.5	1.5	79
Oct	2	Late	1.14	7.47	74.7	1.9	72.9
Oct	3	Late	0.83	5.04	55.5	15.3	40.2
Nov	1	Late	0.51	2.87	28.7	30.2	0
Nov	2	Late	0.35	1.8	1.8	4.2	1.8
					666.2	55.9	615.9

3. Chinese Cabbage

Month	Decade	Stage	Kc coeff	ETc mm/day	ETc mm/dec	Eff rain mm/dec	Irr. Req. mm/dec
Jul	2	Init	0.7	3.11	28	0	27.9
Jul	3	Deve	0.73	3.48	38.3	0	38.2
Aug	1	Deve	0.97	4.87	48.7	0	48.7
Aug	2	Mid	1.08	5.77	57.7	0	57.7
Aug	3	Late	1.08	6.1	67.1	0.2	66.9
Sep	1	Late	1.04	6.17	61.7	0.2	61.5
Sep	2	Late	0.99	6.18	24.7	0.1	24.6
					326.2	0.6	325.6

4. Tomato

Month	Decade	Stage	Kc coeff	ETc mm/day	ETc mm/dec	Eff rain mm/dec	Irr. Req. mm/dec
Aug	1	Init	0.6	3.02	21.2	0	21.1
Aug	2	Init	0.6	3.2	32	0	32
Aug	3	Init	0.6	3.38	37.2	0.2	37
Sep	1	Deve	0.65	3.87	38.7	0.2	38.5
Sep	2	Deve	0.79	4.93	49.3	0.2	49
Sep	3	Deve	0.93	5.86	58.6	2.7	56
Oct	1	Deve	1.07	6.89	68.9	2.9	66
Oct	2	Mid	1.16	7.58	75.8	3.9	72
Oct	3	Mid	1.16	7.05	77.5	15.7	61.8
Nov	1	Mid	1.16	6.46	64.6	30.6	34
Nov	2	Mid	1.16	5.95	59.5	42.2	17.3
Nov	3	Late	1.14	5.52	55.2	45.3	9.9
Dec	1	Late	1.04	4.67	46.7	48.6	0
Dec	2	Late	0.91	3.81	38.1	53.2	0
Dec	3	Late	0.81	3.28	19.7	28.7	0
					743.1	274.5	494.6

5. Cabbage

Month	Decade	Stage	Kc coeff	ETc mm/day	ETc mm/dec	Eff rain mm/dec	Irr. Req. mm/dec
Aug	2	Init	0.7	3.74	33.6	0	33.6
Aug	3	Init	0.7	3.95	43.4	0.2	43.2
Sep	1	Init	0.7	4.16	41.6	0.2	41.4
Sep	2	Init	0.7	4.38	43.8	0.2	43.5
Sep	3	Deve	0.73	4.62	46.2	2.7	43.5
Oct	1	Deve	0.79	5.07	50.7	2.9	47.8
Oct	2	Deve	0.84	5.52	55.2	3.9	51.3
Oct	3	Deve	0.9	5.48	60.2	15.7	44.5
Nov	1	Deve	0.96	5.34	53.4	30.6	22.8
Nov	2	Mid	1.01	5.21	52.1	42.2	9.9
Nov	3	Mid	1.03	4.98	49.8	45.3	4.5
Dec	1	Mid	1.03	4.65	46.5	48.6	0
Dec	2	Mid	1.03	4.32	43.2	53.2	0
Dec	3	Mid	1.03	4.18	45.9	52.6	0
Jan	1	Late	1.03	4.02	40.2	51.4	0
Jan	2	Late	0.98	3.69	36.9	51.3	0
Jan	3	Late	0.93	3.53	10.6	13.8	0
					753.4	414.9	386.1

6. Onion

Month	Decade	Stage	Kc coeff	ETc mm/day	ETc mm/dec	Eff rain mm/dec	Irr. Req. mm/dec
Sep	1	Init	0.7	4.16	37.5	0.2	37.3
Sep	2	Init	0.7	4.38	43.8	0.2	43.5
Sep	3	Deve	0.73	4.64	46.4	2.7	43.8
Oct	1	Deve	0.81	5.24	52.4	2.9	49.4
Oct	2	Deve	0.89	5.82	58.2	3.9	54.3
Oct	3	Deve	0.97	5.89	64.8	15.7	49.1
Nov	1	Mid	1.04	5.78	57.8	30.6	27.2
Nov	2	Mid	1.04	5.37	53.7	42.2	11.5
Nov	3	Mid	1.04	5.03	50.3	45.3	5
Dec	1	Late	1.04	4.68	46.8	48.6	0
Dec	2	Late	1	4.2	42	53.2	0
Dec	3	Late	0.96	3.9	42.9	52.6	0
Jan	1	Late	0.94	3.66	14.6	20.6	0
					611.1	318.7	321.1

7. Amaranthus Hybridas (Bondwe)

Month	Decade	Stage	Kc coeff	ETc mm/day	ETc mm/dec	Eff rain mm/dec	Irr. Req. mm/dec
Sep	1	Init	0.7	4.16	29.1	0.1	29
Sep	2	Deve	0.7	4.4	44	0.2	43.7
Sep	3	Deve	0.79	5	50	2.7	47.4
Oct	1	Deve	0.91	5.9	59	2.9	56.1
Oct	2	Mid	1.03	6.77	67.7	3.9	63.8
Oct	3	Mid	1.07	6.49	71.4	15.7	55.7
Nov	1	Late	1.04	5.83	58.3	30.6	27.7
Nov	2	Late	0.99	5.07	50.7	42.2	8.5
Nov	3	Late	0.95	4.58	9.2	9.1	9.2
					439.4	107.4	341.1

8. Rape

Month	Decade	Stage	Kc coeff	ETc mm/day	ETc mm/dec	Eff rain mm/dec	Irr. Req. mm/dec
Sep	1	Init	0.7	4.16	4.2	0	4.2
Sep	2	Init	0.7	4.38	43.8	0.2	43.5
Sep	3	Deve	0.75	4.75	47.5	2.7	44.9
Oct	1	Mid	0.98	6.33	63.3	2.9	60.4
Oct	2	Mid	1.07	7.01	70.1	3.9	66.3
Oct	3	Late	1.07	6.5	71.5	15.7	55.7
Nov	1	Late	1.01	5.63	56.3	30.6	25.7
Nov	2	Late	0.96	4.92	14.8	12.7	0
					371.5	68.7	300.7

Table A1-7 Crop irrigation schedule

1. Carrot

Crop irrigation schedule

ETc station: KASAMA Crop: Onion Chilemba Planting date: 01/07 Yield red.:

Rain station: KASAMA Soil: Medium (loam) Harvest date: 02/11 **0.0 %**

Table format:
 Irrigation schedule **Timing:** Irrigate at critical depletion
 Daily soil moisture balance **Application:** Refill soil to field capacity
Field eff. 70 %

Totals

Total gross irrigation	788.0 mm	Total rainfall	26.9 mm
Total net irrigation	551.6 mm	Effective rainfall	25.8 mm
Total irrigation losses	0.0 mm	Total rain loss	1.1 mm
Actual water use by crop	662.8 mm	Moist deficit at harvest	85.4 mm
Potential water use by crop	662.8 mm	Actual irrigation requirement	637.0 mm
Efficiency irrigation schedule	100.0 %	Efficiency rain	96.1 %
Deficiency irrigation schedule	0.0 %		

Yield reductions

Stagelabel	A	B	C	D	Season
Reductions in ETc	0.0	0.0	0.0	0.0	0.0 %
Yield response factor	0.80	0.40	1.20	1.00	1.00
Yield reduction	0.0	0.0	0.0	0.0	0.0 %
Cumulative yield reduction	0.0	0.0	0.0	0.0	0.0 %

Date	Day	Stage	Rain mm	Ks fract.	Eta %	Depl %	Net Irr mm	Deficit mm	Loss mm	Gr. Irr mm	Flow l/s/ha
09-Jul	9	Init	0	1	100	32	27.4	0	0	39.1	0.5
19-Jul	19	Init	0	1	100	30	31	0	0	44.2	0.51
31-Jul	31	Dev	0	1	100	35	42.2	0	0	60.2	0.58
13-Aug	44	Dev	0	1	100	40	57	0	0	81.4	0.72
26-Aug	57	Dev	0	1	100	42	68.6	0	0	97.9	0.87
08-Sep	70	Mid	0	1	100	46	79.5	0	0	113.6	1.01
20-Sep	82	Mid	0	1	100	46	80	0	0	114.2	1.1
02-Oct	94	Mid	0	1	100	46	79.2	0	0	113.1	1.09
15-Oct	107	End	0	1	100	50	86.9	0	0	124.1	1.1
02-Nov	End	End	0	1	0	49					

2. Green Maize

Crop irrigation schedule

ETo station: KASAMA Crop: Green Maize Chilem Planting date: 05/07 Yield red.:

Rain station: KASAMA Soil: Medium (loam) Harvest date: 11/11 0.0 %

Table format:

Irrigation schedule Timing: Irrigate at critical depletion

Daily soil moisture balance Application: Refill soil to field capacity

Field eff. 70 %

Totals

Total gross irrigation	680.1 mm	Total rainfall	64.6 mm
Total net irrigation	476.1 mm	Effective rainfall	64.5 mm
Total irrigation losses	0.0 mm	Total rain loss	0.1 mm
Actual water use by crop	664.4 mm	Moist deficit at harvest	123.8 mm
Potential water use by crop	664.4 mm	Actual irrigation requirement	599.9 mm
Efficiency irrigation schedule	100.0 %	Efficiency rain	99.8 %
Deficiency irrigation schedule	0.0 %		

Yield reductions

Stagelabel	A	B	C	D	Season
Reductions in ETc	0.0	0.0	0.0	0.0	0.0 %
Yield response factor	0.40	0.40	1.30	0.50	1.25
Yield reduction	0.0	0.0	0.0	0.0	%
Cumulative yield reduction	0.0	0.0	0.0	0.0	0.0 %

Date	Day	Stage	Rain mm	Ks fract.	Eta %	Depl %	Net Irr mm	Deficit mm	Loss mm	Gr. Irr mm	Flow l/s/ha
25-Aug	52	Dev	0	1	100	55	154	0	0	220	0.49
16-Sep	74	Mid	0	1	100	55	160.4	0	0	229.1	1.21
07-Oct	95	Mid	1	1	100	56	161.7	0	0	231	1.27
11-Nov	End	End	0	1	0	43					

3. Chinese Cabbage

Crop irrigation schedule

ETo station: KASAMA Crop: C Cabbage Chilemba Planting date: 12/07 Yield red.:

Rain station: KASAMA Soil: Medium (loam) Harvest date: 14/09 0.0 %

Table format:

Irrigation schedule Timing: Irrigate at critical depletion

Daily soil moisture balance Application: Refill soil to field capacity

Field eff. 70 %

Totals

Total gross irrigation	394.9 mm	Total rainfall	0.5 mm
Total net irrigation	276.4 mm	Effective rainfall	0.5 mm
Total irrigation losses	0.0 mm	Total rain loss	0.1 mm
Actual water use by crop	320.0 mm	Moist deficit at harvest	43.1 mm
Potential water use by crop	320.0 mm	Actual irrigation requirement	319.6 mm
Efficiency irrigation schedule	100.0 %	Efficiency rain	83.8 %
Deficiency irrigation schedule	0.0 %		

Yield reductions

Stagelabel	A	B	C	D	Season
Reductions in ETc	0.0	0.0	0.0	0.0	0.0 %
Yield response factor	0.80	0.40	1.20	1.00	1.00
Yield reduction	0.0	0.0	0.0	0.0	%
Cumulative yield reduction	0.0	0.0	0.0	0.0	0.0 %

Date	Day	Stage	Rain mm	Ks fract.	Eta %	Depl %	Net Irr mm	Deficit mm	Loss mm	Gr. Irr mm	Flow l/s/ha
22-Jul	11	Init	0	1	100	32	34.9	0	0	49.8	0.52
09-Aug	29	Dev	0	1	100	44	75.1	0	0	107.3	0.69
23-Aug	43	Mid	0.1	1	100	46	80.8	0	0	115.4	0.95
06-Sep	57	End	0	1	100	49	85.6	0	0	122.3	1.01
14-Sep	End	End	0.1	1	100	25					

4. Tomato

Crop irrigation schedule

ETo station: KASAMA Crop: Tomato Chilemba Planting date: 04/08 Yield red.:

Rain station: KASAMA Soil: Medium (loam) Harvest date: 26/12 0.0 %

Table format:

Irrigation schedule Timing: Irrigate at critical depletion

Daily soil moisture balance Application: Refill soil to field capacity

Field eff. 70 %

Totals

Total gross irrigation	525.0 mm	Total rainfall	429.1 mm
Total net irrigation	367.5 mm	Effective rainfall	382.9 mm
Total irrigation losses	0.0 mm	Total rain loss	46.2 mm
Actual water use by crop	739.8 mm	Moist deficit at harvest	9.8 mm
Potential water use by crop	739.8 mm	Actual irrigation requirement	356.9 mm
Efficiency irrigation schedule	100.0 %	Efficiency rain	89.2 %
Deficiency irrigation schedule	0.0 %		

Yield reductions

Stagelabel	A	B	C	D	Season	
Reductions in ETc	0.0	0.0	0.0	0.0	0.0	%
Yield response factor	0.50	0.60	1.10	0.80	1.05	
Yield reduction	0.0	0.0	0.0	0.0	0.0	%
Cumulative yield reduction	0.0	0.0	0.0	0.0	0.0	%

Date	Day	Stage	Rain mm	Ks fract.	Eta %	Depl %	Net Irr mm	Deficit mm	Loss mm	Gr. Irr mm	Flow l/s/ha
14-Aug	11	Init	0	1	100	32	33.9	0	0	48.5	0.51
28-Aug	25	Init	0	1	100	31	46.1	0	0	65.8	0.54
14-Sep	42	Dev	0	1	100	34	68.3	0	0	97.5	0.66
02-Oct	60	Dev	0	1	100	38	99.1	0	0	141.6	0.91
19-Oct	77	Mid	0	1	100	41	120	0	0	171.5	1.17

5. Cabbage

Crop irrigation schedule

ETo station: KASAMA Crop: Cabbage Chilemba Planting date: 12/08 Yield red.:

Rain station: KASAMA Soil: Medium (loam) Harvest date: 23/01 0.0 %

Table format:

Irrigation schedule Timing: Irrigate at critical depletion

Daily soil moisture balance Application: Refill soil to field capacity

Field eff. 70 %

Totals

Total gross irrigation	491.3 mm	Total rainfall	719.5 mm
Total net irrigation	343.9 mm	Effective rainfall	405.9 mm
Total irrigation losses	0.0 mm	Total rain loss	313.6 mm
Actual water use by crop	749.8 mm	Moist deficit at harvest	0.0 mm
Potential water use by crop	749.8 mm	Actual irrigation requirement	343.9 mm
Efficiency irrigation schedule	100.0 %	Efficiency rain	56.4 %
Deficiency irrigation schedule	0.0 %		

Yield reductions

Stagelabel	A	B	C	D	Season	
Reductions in ETc	0.0	0.0	0.0	0.0	0.0	%
Yield response factor	0.20	0.40	0.45	0.60	0.95	
Yield reduction	0.0	0.0	0.0	0.0	0.0	%
Cumulative yield reduction	0.0	0.0	0.0	0.0	0.0	%

Date	Day	Stage	Rain mm	Ks fract.	Eta %	Depl %	Net Irr mm	Deficit mm	Loss mm	Gr. Irr mm	Flow l/s/ha
21-Aug	10	Init	0	1	100	47	37.6	0	0	53.7	0.62
31-Aug	20	Init	0	1	100	45	39.3	0	0	56.1	0.65
11-Sep	31	Init	0	1	100	48	45.9	0	0	65.5	0.69
22-Sep	42	Dev	0	1	100	47	48.4	0	0	69.2	0.73
04-Oct	54	Dev	0	1	100	49	54.9	0	0	78.5	0.76
15-Oct	65	Dev	0	1	100	47	55.9	0	0	79.9	0.84
30-Oct	80	Dev	0	1	100	48	62	0	0	88.6	0.68
23-Jan	End	End	0	1	0	0					

6. Onion

Crop irrigation schedule

ETo station: KASAMA Crop: Onion Chilemba Planting date: 02/09 Yield red.:

Rain station: KASAMA Soil: Medium (loam) Harvest date: 04/01 0.0 %

Table format:

Irrigation schedule Timing: Irrigate at critical depletion

Daily soil moisture balance Application: Refill soil to field capacity

Field eff. 70 %

Totals

Total gross irrigation	348.5 mm	Total rainfall	528.4 mm
Total net irrigation	244.0 mm	Effective rainfall	363.7 mm
Total irrigation losses	0.0 mm	Total rain loss	164.7 mm
Actual water use by crop	607.5 mm	Moist deficit at harvest	3.7 mm
Potential water use by crop	607.5 mm	Actual irrigation requirement	243.8 mm
Efficiency irrigation schedule	100.0 %	Efficiency rain	68.8 %
Deficiency irrigation schedule	0.0 %		

Yield reductions

Stagelabel	A	B	C	D	Season	
Reductions in ETC	0.0	0.0	0.0	0.0	0.0	%
Yield response factor	0.80	0.40	1.20	1.00	1.00	
Yield reduction	0.0	0.0	0.0	0.0	0.0	%
Cumulative yield reduction	0.0	0.0	0.0	0.0	0.0	%

Date	Day	Stage	Rain mm	Ks fract.	Eta %	Depl %	Net Irr mm	Deficit mm	Loss mm	Gr. Irr mm	Flow l/s/ha
07-Sep	6	Init	0.1	1	100	30	24.8	0	0	35.5	0.68
14-Sep	13	Init	0	1	100	32	29.9	0	0	42.7	0.71
22-Sep	21	Dev	0	1	100	34	35.4	0	0	50.6	0.73
01-Oct	30	Dev	0	1	100	34	41	0	0	58.6	0.75
11-Oct	40	Dev	0	1	100	38	51	0	0	72.9	0.84
22-Oct	51	Dev	0	1	100	41	61.8	0	0	88.3	0.93
04-Jan	End	End	0	1	100	2					

7. Bondwe

Crop irrigation schedule

ETo station: KASAMA Crop: Bondwe Chilemba Planting date: 04/09 Yield red.:

Rain station: KASAMA Soil: Medium (loam) Harvest date: 22/11 0.0 %

Table format:

Irrigation schedule Timing: Irrigate at critical depletion

Daily soil moisture balance Application: Refill soil to field capacity

Field eff. 70 %

Totals

Total gross irrigation	365.1 mm	Total rainfall	116.9 mm
Total net irrigation	255.6 mm	Effective rainfall	107.3 mm
Total irrigation losses	0.0 mm	Total rain loss	9.6 mm
Actual water use by crop	434.8 mm	Moist deficit at harvest	72.0 mm
Potential water use by crop	434.8 mm	Actual irrigation requirement	327.5 mm
Efficiency irrigation schedule	100.0 %	Efficiency rain	91.8 %
Deficiency irrigation schedule	0.0 %		

Yield reductions

Stagelabel	A	B	C	D	Season	
Reductions in ETC	0.0	0.0	0.0	0.0	0.0	%
Yield response factor	0.80	0.40	1.20	1.00	1.00	
Yield reduction	0.0	0.0	0.0	0.0	0.0	%
Cumulative yield reduction	0.0	0.0	0.0	0.0	0.0	%

Date	Day	Stage	Rain mm	Ks fract.	Eta %	Depl %	Net Irr mm	Deficit mm	Loss mm	Gr. Irr mm	Flow l/s/ha
10-Sep	7	Init	0	1	100	33	29.1	0	0	41.5	0.69
18-Sep	15	Init	0	1	100	33	35	0	0	50	0.72
28-Sep	25	Dev	0	1	100	36	46.1	0	0	65.9	0.76
10-Oct	37	Dev	0	1	100	43	67.1	0	0	95.8	0.92
22-Oct	49	Mid	0	1	100	45	78.3	0	0	111.9	1.08
22-Nov	End	End	0	1	100	41					

8. Rape

Crop irrigation schedule

ETo station: KASAMA Crop: Rape Chilemba Planting date: 10/09 Yield red.:

Rain station: KASAMA Soil: Medium (loam) Harvest date: 13/11 **0.0 %**

Table format:

Irrigation schedule **Timing:** Irrigate at critical depletion

Daily soil moisture balance **Application:** Refill soil to field capacity

Field eff. 70 %

Totals

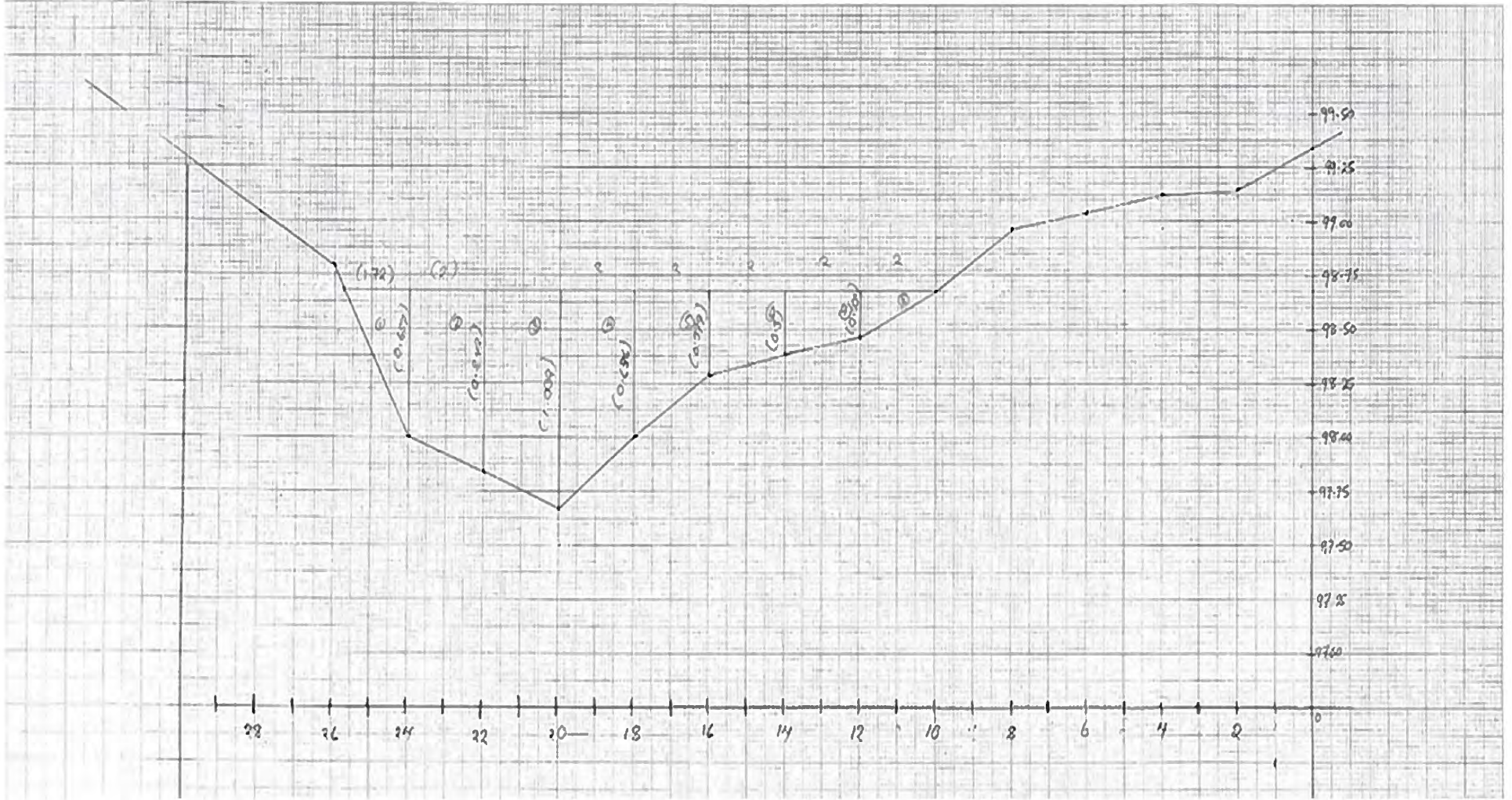
Total gross irrigation	335.4 mm	Total rainfall	90.5 mm
Total net irrigation	234.8 mm	Effective rainfall	80.8 mm
Total irrigation losses	0.0 mm	Total rain loss	9.7 mm
Actual water use by crop	366.5 mm	Moist deficit at harvest	51.0 mm
Potential water use by crop	366.5 mm	Actual irrigation requirement	285.8 mm
Efficiency irrigation schedule	100.0 %	Efficiency rain	89.3 %
Deficiency irrigation schedule	0.0 %		

Yield reductions

Stagelabel	A	B	C	D	Season	
Reductions in ETc	0.0	0.0	0.0	0.0	0.0	%
Yield response factor	0.80	0.40	1.20	1.00	1.00	
Yield reduction	0.0	0.0	0.0	0.0	0.0	%
Cumulative yield reduction	0.0	0.0	0.0	0.0	0.0	%

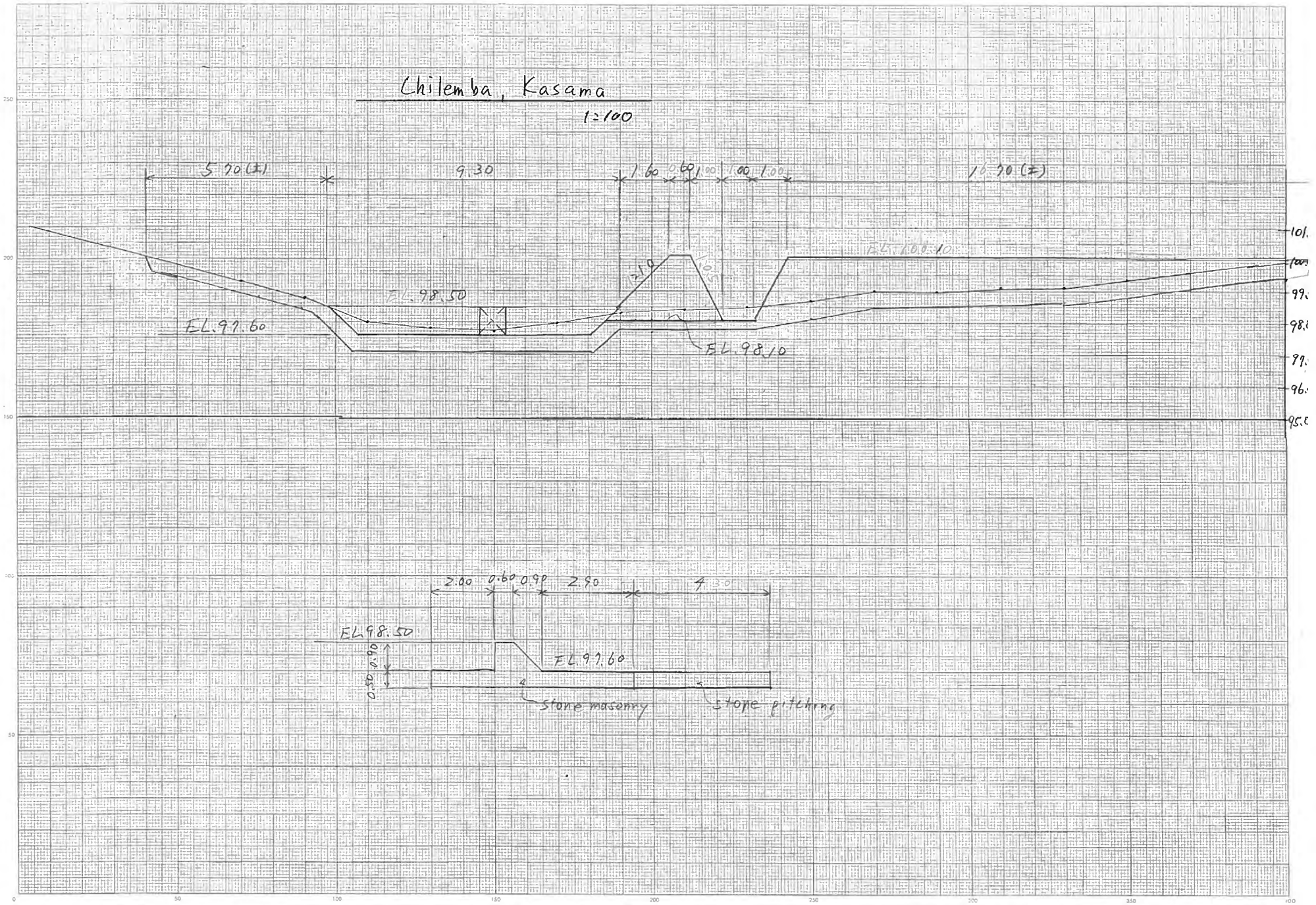
Date	Day	Stage	Rain mm	Ks fract.	Eta %	Depl %	Net Irr mm	Deficit mm	Loss mm	Gr. Irr mm	Flow l/s/ha
16-Sep	7	Init	0	1	100	32	30.3	0	0	43.3	0.72
25-Sep	16	Dev	0	1	100	32	39.9	0	0	57	0.73
10-Oct	31	Mid	0	1	100	48	83.8	0	0	119.7	0.92
22-Oct	43	Mid	0	1	100	46	80.8	0	0	115.4	1.11
13-Nov	End	End	18.9	1	100	29					

AP-1-E-27



Chitemba, Kasama

1:100



5.70 (±)

9.30

1.60 0.60 1.00 1.00 1.00

16.70 (±)

EL. 99.60

EL. 98.50

EL. 98.10

EL. 100.10

101.
100.
99.
98.
97.
96.
95.0

2.00 0.60 0.90 2.90 4.90

EL. 98.50

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0.60
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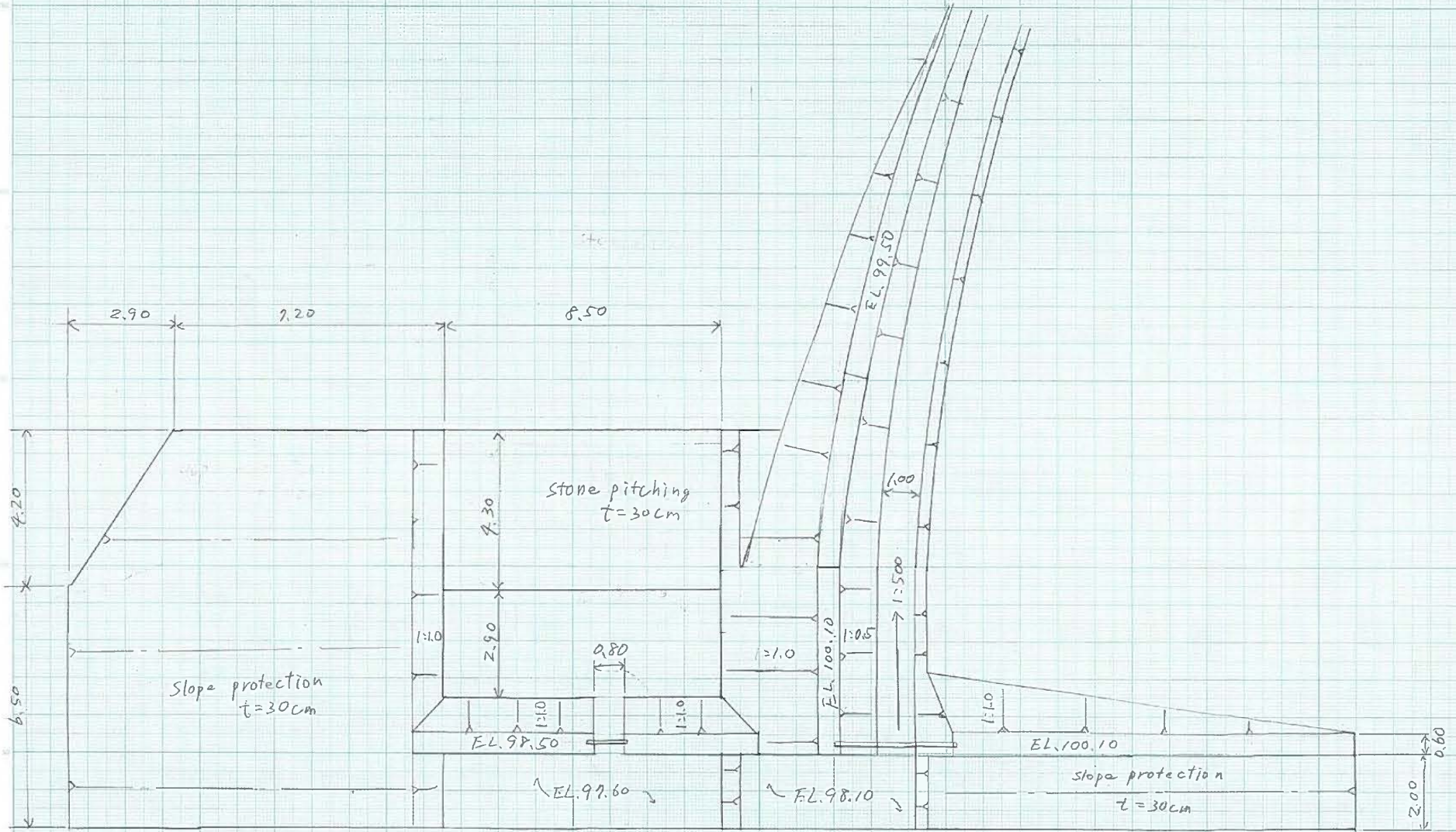
stone masonry

stone pitching

AP-1-E-28

Chilemba, Kasama

1:100



AP-1-E-29

Site Name		Chilerba, Kasama District				
No.	Item	Specification/Quality	calculation	Amount	Unit	Remarks
1	Stone Masonry					
1-1	Apron		$6.5 \times 0.5 \times 8 =$	26	m ³	
1-2	Spillway		$(0.6 + 1.5) / 2 \times 0.9 \times ((9 + 7.3) / 2 - 0.8) =$	6.95	m ³	
1-3	Left slope		$6.5 \times 10.1 \times 0.3 =$	30.59	m ³	
			$(10.1 + 7.2) / 2 \times 4.2 \times 0.3 =$	19.70	m ³	
				10.90	m ³	
1-4	Right Upstream		$(4.3 + 4 + 3.5 + 2 + 7.3) \times 2.0 \times 0.3 =$	12.66	m ³	
		t = 30cm				
1-5	Right canal			57.65	m ³	
		left slope	$0.6 \times 7.2 \times 0.3 =$	1.30	m ³	
		Bottom	$1.5 \times 0.3 \times 20 =$	9.00	m ³	
		left wall	$(0.6 + 3.3) / 2 \times 1.8 = 3.51 \text{ m}^2$			
			$(0.6 + 2.3) / 2 \times 1.2 = 1.74 \text{ m}^2$			
			$(0.6 + 1.2) / 2 \times 0.5 = 0.45 \text{ m}^2$			
			$3.51 \times 5 + (3.51 + 1.7) / 2 \times 5 + (1.74 + 0.45) / 2 \times 10 =$	41.625	m ³	
		right wall	$(1.9 \times 5 + (1.9 + 1.3) / 2 \times 5 + (1.3 + 0.7) / 2 \times 10) \times 0.2 =$	5.5	m ³	
			$(0.6 + 1.2) / 2 \times 0.5 \times 0.5 =$	0.225	m ³	
1-6	canal lining	100m	$1.9 \times 0.2 \times 100 =$	38.00		
Stone Masonry Total				171.85	m³	

Site Name		Kalashi, Mporokoso				
No.	Item	Specification/Quality	calculation	Amount	Unit	Remarks
	Stone Masonry Total			198.84	m³	
2	Excavation			312.90	m ³	
2-1	Apron		$(0.7 + 1.8) / 2 \times 1.1 = 1.375 \text{ m}^2$, $(1.8 + 1.0) / 2 \times 4.6 = 6.44 \text{ m}^2$ $(1.0 + 0.5) / 2 \times 2.0 = 1.5 \text{ m}^2$, $(0.5 + 1.7) / 2 \times 2.1 = 2.31 \text{ m}^2$ $(1.7 + 0.5) / 2 \times 1.7 = 1.87 \text{ m}^2$ $(1.375 + 6.44 + 1.5 + 2.31 + 1.87) \times 13.3 =$	179.48	m ³	
2-2	Left side abut		$(1.1 + 2.3) / 2 \times 11 \times 0.5 =$	9.35	m ³	
2-3	Left side upstream		$(0.3 + 1.1) / 2 \times 0.4 = 0.28 \text{ m}^2$, $(1.1 + 0.6) / 2 \times 4.5 = 3.825 \text{ m}^2$, $2.0 \times 11.3 \times 0.3 + (0.28 + 3.825) \times 2.5 =$	17.0425	m ³	
2-4	Left side canal		$(0.28 + 3.825) / 2 \times 20 =$	41.05	m ³	
2-5	Right side slope		$(7.3 + 12.3) / 2 \times 7.2 \times 0.3 =$ $12.3 \times 5.8 \times 0.3 =$	21.17 21.40	m ³ m ³	
2-6	River Diversion		$(1.0 + 1.6) / 2 \times 0.6 \times 30 =$	23.40	m ³	

Site Name		Chilenba, Kasama District				
No.	Item	Specification/Quality	calculation	Amount	Unit	Remarks
2	Excavation			169.00	m ³	
2-1	Apron		$(1.2 + 0.4) / 2 \times 2 = 1.6 \text{ m}^2$, $(0.4 + 0.2) / 2 \times 2 = 0.6 \text{ m}^2$ $(0.2 + 0.1) / 2 \times 2 = 0.3 \text{ m}^2$, $(0.1 + 0.4) / 2 \times 2 = 0.5 \text{ m}^2$ $(1.6 + 0.3 + 0.6 + 0.5 + 1.05) \times 10.7 =$	43.335	m ³	
2-2	Left side		$(7.2 + 10.1) / 2 \times 4.2 \times 0.3 + (6.5 \times 10.1 \times 0.3) = 30.594 \text{ m}^3$	30.594	m ³	
2-3	Right side canal		$(0.3 + 0.4) / 2 \times 2 = 0.7 \text{ m}^2$, $(0.4 + 0.5) / 2 \times 2 = 0.9 \text{ m}^2$ $0.7 \times 10 + (0.7 + 0.9) / 2 \times 10 =$ $3.7 \times 0.5 \times 2 + 3.6 \times 0.3 \times 2 + 9.4 \times 0.3 \times 2 =$ $1.6 / 2 \times 0.3 \times 10 =$	15 11.5 2.4	m ³ m ³ m ³	
2-4	Right side upstream		$(0.9 + 11.5) / 2 \times 2 = 12.4 \text{ m}^2$, $(11.5 + 0.3) / 2 \times 0.9 = 5.31 \text{ m}^2$ $0.5 \times 0.6 = 0.3 \text{ m}^2$ $(11.5 + 5.31 + 0.3) \times 2.5 =$	42.775	m ³	
2-5	River Diversion		$(1.0 + 1.6) / 2 \times 0.6 \times 30 =$	23.40	m ³	
<hr style="border-top: 1px dashed blue;"/>						

Site Name		Chilerba, Kasama District				
No.	Item	Specification/Quality	Calculation	Amount	Unit	Remarks
3	Back filling	river diversion		23.40	m ³	
4	Stone Pitching	t=30cm	$8.5 \times 4.3 \times 0.3 =$	10.97	m ³	
5	Stoplog					
	Plank	t=25mm	$(0.7 + 2.9) / 2 \times 2.2 + 0.9 \times 0.9$	4.77	m ²	
	Timber	50 x 50	$(0.7 + 2.9) / 2 \times 4 + 2.3 \times 2 + 0.9 \times 2 + 0.9 \times 2$	15.4	m	
	Stone Masonry			171.85	m ³	
	Rubble Stone			196.56	m ³	
	Mortar			94.52	m ³	
	Sand			85.06	m ³	
	Cement			850.64	bag	

Quantity		Site Name		Chilamba, Kasama District		
No.	Item	Specification/Quality	Quantity	Unit		Remarks
1	Excavation		169.0	m ³		
1-1	Apron		43.3	m ³		
1-2	Left side		30.6	m ³		
1-3	Right side canal		28.9	m ³		
1-4	Right side upstream		42.8	m ³		
1-5	River Diversion		23.4	m ³		
2	Stone masonry		171.8	m ³		
2-1	Apron		26.0	m ³		
2-2	Spillway		6.9	m ³		
2-3	Left slope		30.6	m ³		
2-4	Right Upstream		12.7	m ³		
2-5	Right canal		57.6	m ³		
2-6	canal lining		38.0	m ³		
3	Back filling					
3-1	river diversion	river diversion	23.4	m ³		
4	Stone Pitching					
	Stone Pitching		11.0	m ³		
	Rubble stone		196.6	m ³		
	Mortar		94.5	m ³		
	Sand		85.1	m ³		
	Cement		851.0	bags		
	Stopslog	Plank	4.8	m ²		t=25mm
		Timber 50x50	15.4	m		

Manpower		Site Name Chilamba, Kasarna District					
No.	Item	Specification/Quality	Quantity	Unit		Remarks	
	Work Period						
	Site clearing	unskilled labor			50.0	man·day	
	Gathering stones	unskilled labor	196.6	m ³	294.8	man·day	15man/10m ³
	Gathering sand	unskilled labor	85.1	m ³	42.5	man·day	5.0man/10m ³
1	Excavation		169.0	m ³	131.8	man·day	7.8man/10m ³
1-1	Apron		43.3	m ³	33.8	man·day	
1-2	Left side		30.6	m ³	23.9	man·day	
1-3	Right side canal		28.9	m ³	22.5	man·day	
1-4	Right side upstream		42.8	m ³	33.4	man·day	
1-5	River Diversion		23.4	m ³	18.3	man·day	
2	Stone masonry		171.8	m ³			
2-1	Apron		26.0	m ³			
		unskilled labor			93.6	man·day	3.6man/m ³
		skilled labor			15.6	man·day	0.6man/m ³
		foreman			7.8	man·day	0.3man/m ³
2-2	Spillway		6.9	m ³			
		unskilled labor			25.0	man·day	3.6man/m ³
		skilled labor			4.2	man·day	0.6man/m ³
		foreman			2.1	man·day	0.3man/m ³
2-3	Left slope		30.6	m ³			
		unskilled labor			110.1	man·day	3.6man/m ³
		skilled labor			18.4	man·day	0.6man/m ³
		foreman			9.2	man·day	0.3man/m ³
2-4	Right Upstream		12.7	m ³			
		unskilled labor			45.6	man·day	3.6man/m ³
		skilled labor			7.6	man·day	0.6man/m ³
		foreman			3.8	man·day	0.3man/m ³
2-5	Right canal		57.6	m ³			
		unskilled labor			207.5	man·day	3.6man/m ³
		skilled labor			34.6	man·day	0.6man/m ³
		foreman			17.3	man·day	0.3man/m ³
2-6	canal lining		38.0	m ³			
		unskilled labor			136.8	man·day	3.6man/m ³
		skilled labor			22.8	man·day	0.6man/m ³
		foreman			11.4	man·day	0.3man/m ³
3	Back filling						
3-1	river diversion		23.4	m ³	17.8	man·day	7.6man/10m ³
4	Stone Pitching						
	Stone Pitching	unskilled labor	11.0	m ³	21.9	man·day	2.0man/m ³
	Total excavation	unskilled labor	169.0	m ³	131.8	man·day	7.8man/10m ³
	Stone masonry	unskilled labor	171.8	m ³	618.6	man·day	3.6man/m ³
		skilled labor	171.8	m ³	103.1	man·day	0.6man/m ³
		foreman	171.8	m ³	51.6	man·day	0.3man/m ³
	mortar work	unskilled labor	94.5	m ³	567.1	man·day	6man/m ³
	Erbankment/backfilling	unskilled labor	23.4	m ³	17.8	man·day	7.6man/10m ³
	Stone Pitching	unskilled labor	11.0	m ³	21.9	man·day	2.0man/m ³
5	Transportation						
		Stones	196.6	m ³	50.0	trips	
		Sand	85.1	m ³	22.0	trips	
		Cement	851.0	bags	5.0	trips	

Work period		Site Name		Chilerba, Kasama District			
No.	Item	Specification/Quality	Quantity	unit	day	Remarks	
	skilled labor						
	unskilled labor						
1	Preparation Work				16	day	
	Site clearing		50	m ² d	1.7	day	30 man/day
	Accessroad, temporary yard		50	m ² d	1.7	day	30 man/day
	Gathering stones		295	m ² d	9.8	day	30 man/day
	Gathering sand		43	m ² d	1.4	day	30 man/day
	Cofferdam		25		1.0	day	30 man/day
1	Excavation				4.8	day	
1-1	Apron		33.8	m ² d	1.1	day	30 man/day
1-2	Left side		23.9	m ² d	1.2	day	30 man/day
1-3	Right side canal		22.5	m ² d	0.8	day	30 man/day
1-4	Right side upstream		33.4	m ² d	1.1	day	30 man/day
1-5	River Diversion		18.3	m ² d	0.6	day	30 man/day
2	Stone masonry		2 sets		51.6	day	
2-1	Apron						
		unskilled labor	93.6	m ² d	7.8	day	12 man/day
		skilled labor	15.6	m ² d	7.8	day	2 man/day
		foreman	7.8	m ² d	7.8	day	1 man/day
2-2	Spillway						
		unskilled labor	25.0	m ² d	2.1	day	12 man/day
		skilled labor	4.2	m ² d	2.1	day	2 man/day
		foreman	2.1	m ² d	2.1	day	1 man/day
2-3	Left slope						
		unskilled labor	110.1	m ² d	9.2	day	12 man/day
		skilled labor	18.4	m ² d	9.2	day	2 man/day
		foreman	9.2	m ² d	9.2	day	1 man/day
2-4	Right Upstream						
		unskilled labor	45.6	m ² d	3.8	day	12 man/day
		skilled labor	7.6	m ² d	3.8	day	2 man/day
		foreman	3.8	m ² d	3.8	day	1 man/day
2-5	Right canal						
		unskilled labor	207.5	m ² d	17.3	day	12 man/day
		skilled labor	34.6	m ² d	17.3	day	2 man/day
		foreman	17.3	m ² d	17.3	day	1 man/day
2-6	canal lining						
		unskilled labor	136.8	m ² d	11.4	day	12 man/day
		skilled labor	22.8	m ² d	11.4	day	2 man/day
		foreman	11.4	m ² d	11.4	day	1 man/day
3	Mortar mixing						
		unskilled labor	567.1	m ² d	47.3	day	12 man/day
4	Erbankment/backfilling						
4-1	river diversion		17.8	m ² d	0.6	day	30 man/day
5	Stone Pitching						
	Stone Pitching		21.9	m ² d	0.7	day	30 man/day

Labor Material and Tools

Chilerba, Kasama District

Item	name	specification, quality,	quantity	unit	remarks
1-1-2	Mortar per 1m ³	1:3	0.89m ³ /day/1set		
	Material				
	Cement	Ordinary Portland	8.50	bags	425kg
	Sand	River sand	0.80	m ³	1.0 x 0.8
	Material Total				
	Labor				
	Mortar mixing	unskilled labor	2.25	man	2 x 9 / 8
	Helper	unskilled labor	4.50	man	4 x 9 / 8
	Labor Total		6.75	man	
	Tools (Daily)				
	Shovel		2.00	pcs	
	Bucket	20 lit	2.00	pcs	
	Wheel barrow		1.00	pc	
	Mortar box		1.00	pc	
1-2-2	1:3 Mortar per 0.89m ³ / day/ 1 set				
	Material				
	Cement	Ordinary Portland	7.60	bags	380kg
	Sand	River sand	0.71	m ³	0.89 x 0.8
	Material Total				
	Labor				
	Mortar mixing	unskilled labor	2.00	man	
	Helper	unskilled labor	4.00	man	
	Labor Total		6.00	man	
	Tools (Daily)				
	Shovel		2.00	pcs	
	Bucket	20 lit	2.00	pcs	
	Wheel barrow		1.00	pc	
	Mortar box		1.00	pc	
5	Excavation (by hand) per 10m ³				
	Labor				
	unskilled labor		7.80	man	
	Tools				
	Shovel		3.00	pcs	
	Pickaxe		2.00	pcs	
	Hoe		2.80	pcs	
	String		1.00	roll	
	Peg				

Item	name	specification, quality,	quantity	unit		remarks
6	Hauling excavated material per 1.0 m ³ by wheel barrow					
	Labor					
	unskilled labor	~20m	0.02	man		
	Wheel barrow	20~40m	0.06	man		
		40~60m	0.14	man		
		60~80m	0.24	man		
		80~100m	0.34	man		
		100~120m	0.44	man		
		120~140m	0.56	man		
		140~160m	0.66	man		
		160~180m	0.78	man		
		180~200m	0.90	man		
		one way distance				
7	Embankment (by hand) per 10m ³					
	unskilled labor		7.60	man		
	Tools					
	Shovel		2.00	pcs		
	Hoe		3.60	pcs		
	Rammer		2.00	pcs		
	String		1.00	roll		
	Peg					
8	Finishing slope (cut earth) per 100m ²					
	Labor					
	Foreman		1.40	man		
	Unskilled labor		11.80	man		
	Total labor		13.20	man		
	Tools					
	Shovel		4.00	pcs		
	Hoe		7.80	pcs		
	String		1.00	roll		
9	Finishing slope (embankment) per 100m ²					
	Labor					
	Foreman		1.60	man		
	Unskilled labor		25.80	man		
	Total labor		27.40	man		
	Tools					
	Shovel		4.00	pcs		
	Hoe		21.80	pcs		
	String		1.00	roll		

Item	name	specification, quality,	quantity	unit	remarks
10	Stone masonry	per 1m ³			
	Material				
	Rubble stone		1.08	m ³	
	Mortar		0.55	m ³	
	Total material				
	Labor (not include mortar mixing)				
	Foreman		0.30	man	
	Skilled labor		0.60	man	
	Unskilled labor		3.60	man	
	Total labor		4.50	man	
	Tools (Daily, not include mortar mixing)				
	Bucket	20 lit	3.00	pcs	
	Wheel barrow		3.00	pc	
	Trowel		3.00	pcs	
	Builder's level		1.00	pc	
	Measuring tape		1.00	pc	
	Peg				
13	Gathering stones	per 10m ³	distance 50m		
	Unskilled labor		15.00	man	
	Tools (daily)				
	Wheel barrow		7.00	pcs	
	14 lbs hammer		4.00	pcs	
	4 lbs hammer		2.00	pcs	
	Chisel		2.00	pcs	
14	Tractor trailer loading and unloading				
	4 m ³ / 1 trip, 4 trips / day = 12 m ³ / day				
	unskilled labor		15.00	man	
15	Fuel consumption				
	Tractor			lit/10km	
	Truck	6 ton		lit/10km	
	Truck	4 ton		lit/10km	
	Pickup			lit/10km	

Tools		Site Name		Chilerba, Kasama District		
No.	Item	Specification/Quality	Quantity	Unit		Remarks
1	Mortar mixing 1set Tools (Daily)		2	set		
	Shovel		2.00	pcs	4.00	pcs
	Bucket	20 lit	4.00	pcs	8.00	pcs
	Wheel barrow		2.00	pc	4.00	pc
2	Stonemasonry work Tools (Daily, not include mortar mixing)	1set	2.0	set		
	Bucket	20 lit	3.00	pcs	6.0	pcs
	Wheel barrow		4.00	pc	8.0	pc
	Trowel		3.00	pcs	6.0	pcs
	Builder's level		1.00	pc	2.0	pc
	Measuring tape	5m	1.00	pc	2.0	pc
	Peg					
3	Excavation (by hand)	per 10m ³ 1set	3.0	sets		
	Tools					
	Shovel		2.00	pcs	6.0	pcs
	Pickaxe		2.00	pcs	6.0	pcs
	Hoe		3.80	pcs	11.4	pcs
	String		1.00	roll	1.0	roll
	Peg					
4	Embankment (by hand)	per 10m ³ 1set	2.00	sets		
	Tools					
	Shovel		2.00	pcs	4.0	pcs
	Hoe		3.60	pcs	7.2	pcs
	Rammer		2.00	pcs	4.0	pcs
	String		1.00	roll	1.0	roll
	Wheelbarrow		3.00	pcs	6.0	pcs
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TOTAL REQUIRED TOOLS						
	Shovel				6.0	
	Pickaxe				6.0	
	Bucket				12.0	
	Wheelbarrow				12.0	
	String				1.0	
	Trowel				6.0	
	Builders level				2.0	
	Measuring tape	5m			2.0	

Cost Estimation		Site Name		Chilerba, Kasama District			Remarks
No.	Item	Specification/Quality	Quantity	Unit	Unit Price ZMK	Price ZMK	
1	Preparation Work						
	Site clearing	unskilled labor	50.0	man	30.0	1,500.0	
	Access road, temporary	unskilled labor	50.0	man	30.0	1,500.0	
	Gathering stones	unskilled labor	294.8	man	30.0	8,845.1	
	Gathering sand	unskilled labor	42.5	man	30.0	1,276.0	
	Cofferdam	unskilled labor	25.0	man	30.0	750.0	
	labor total	unskilled labor	437.4			13,121.1	
2	Stone Masonry Weir	V=	171.8	m ³			
	rubble stone		196.6	m ³	0.0	0.0	
	sand		85.1	m ³	0.0	0.0	
	cement	ordinary portland	851.0	bag	75.0	63,825.0	
	Plank	25x200x5, 500	5.0	pc	60.0	300.0	
	Timber	50x50x5, 500	4.0	pc	22.5	90.0	
	Stop-log frame		1.0	L.S		3,500.0	
	material total					67,715.0	
	excavation	unskilled labor	131.8	man	30.0	3,954.7	
	mortar mixing	unskilled labor	567.1	man	30.0	17,012.7	
	stone masonry	foreman	51.6	man	0.0	0.0	
		skilled labor	103.1	man	30.0	3,093.2	
		unskilled labor	618.6	man	100.0	24,060.6	
3	Transportation					69,100.0	
		Stones	50.0	trips	800.0	40,000.0	10t truck
		Sand	22.0	trips	800.0	17,600.0	10t truck
		Cement	5.0	trips	2,000.0	10,000.0	10t truck
		Tools	1.0	trips	1,500.0	1,500.0	
4	River bed protection						
		unskilled labor	21.9	man	30.0	657.9	
5	Tools			L.S		15,000.0	
	Total Material Cost					67,765.0	
	rubble stone		196.6	m ³	0.0	0.0	
	sand		85.1	m ³	0.0	0.0	
	cement	ordinary portland	851.0	bag	75.0	63,825.0	
	Plank	25x200x5, 500	5.0	pc	70.0	350.0	
	Timber	50x50x5, 500	4.0	pc	22.5	90.0	
	Stop-log frame		1.0	L.S	3,500.0	3,500.0	
	Total Labor Cost					63,616.5	
	foreman		51.6	man	0.0	0.0	
	skilled labor		103.1	man	100.0	10,310.7	
	unskilled labor		1776.9	man	30.0	53,305.7	
Total Construction Cost (A)						215,481.5	
Cost for S/V (B)						28,757.0	
	Fuel		1,850.0	lit	10.72	19,832.0	diesel
	MA		105.0	day	85.0	8,925.0	
	stationary					0.0	
Total Project Cost (A) + (B)						244,238.5	

Cost Estimation		Site Name		Chilemba, Kasama District			
No.	Item	Specification/Quantity	Quantity	Unit	Unit Price ZMK	Price ZMK	Remarks
1	Preparation Work						
	Site clearing	unskilled labor	50.0	man	30.0	1,500.0	
	Access road, temporary	unskilled labor	50.0	man	30.0	1,500.0	
	Gathering stones	unskilled labor	294.8	man	30.0	8,845.1	
	Gathering sand	unskilled labor	42.5	man	30.0	1,276.0	
	Cofferdam	unskilled labor	25.0	man	30.0	750.0	
	labor total	unskilled labor	437.4			13,121.1	
2	Stone Masonry Weir	V=	171.8	m ³			
	rubble stone		196.6	m ³	0.0	0.0	
	sand		85.1	m ³	0.0	0.0	
	cement	ordinary portland	851.0	bag	75.0	63,825.0	
	Plank	25x200x5,500	5.0	pc	60.0	300.0	
	Timber	50x50x5,500	4.0	pc	22.5	90.0	
	Stop-log frame		1.0	L.S		3,500.0	
	material total					67,715.0	
	excavation	unskilled labor	131.8	man	30.0	3,954.7	
	mortar mixing	unskilled labor	567.1	man	30.0	17,012.7	
	stone masonry	foreman	51.6	man	0.0	0.0	
		skilled labor	103.1	man	30.0	3,093.2	
		unskilled labor	618.6	man	100.0	24,060.6	
3	Transportation					69,100.0	
		Stones	50.0	trips	800.0	40,000.0	10t truck
		Sand	22.0	trips	800.0	17,600.0	10t truck
		Cement	5.0	trips	2,000.0	10,000.0	10t truck
		Tools	1.0	trips	1,500.0	1,500.0	
4	River bed protection						
		unskilled labor	21.9	man	30.0	657.9	
5	Tools			L.S		15,000.0	
	Total Material Cost					67,765.0	
	rubble stone		196.6	m ³	0.0	0.0	
	sand		85.1	m ³	0.0	0.0	
	cement	ordinary portland	851.0	bag	75.0	63,825.0	
	Plank	25x200x5,500	5.0	pc	70.0	350.0	
	Timber	50x50x5,500	4.0	pc	22.5	90.0	
	Stop-log frame		1.0	L.S	3,500.0	3,500.0	
	Total Labor Cost					63,616.5	
	foreman		51.6	man	0.0	0.0	
	skilled labor		103.1	man	100.0	10,310.7	
	unskilled labor		1776.9	man	30.0	53,305.7	
	Total Construction Cost (A)					215,481.5	

Tools		Site Name		Chilemba, Kasama District			
No.	Item	Specification/Quantity	Quantity	Unit			Remarks
1	Mortar mixing 1set		2	set			
	Tools (Daily)						
	Shovel		2.00	pcs	4.00	pcs	
	Bucket	20 lit	4.00	pcs	8.00	pcs	
	Wheel barrow		2.00	pc	4.00	pc	
2	Stonemasonry work	1set	2.0	set			
	Tools (Daily, not include mortar mixing)						
	Bucket	20 lit	3.00	pcs	6.0	pcs	
	Wheel barrow		4.00	pc	8.0	pc	
	Trowel		3.00	pcs	6.0	pcs	
	Builder's level		1.00	pc	2.0	pc	
	Measuring tape	5m	1.00	pc	2.0	pc	
	Peg						
3	Excavation (by hand)	per 10m ³ 1set	3.0	sets			
	Tools						
	Shovel		2.00	pcs	6.0	pcs	
	Pickaxe		2.00	pcs	6.0	pcs	
	Hoe		3.80	pcs	11.4	pcs	
	String		1.00	roll	1.0	roll	
	Peg						
4	Embankment (by hand)	per 10m ³ 1set	2.00	sets			
	Tools						
	Shovel		2.00	pcs	4.0	pcs	
	Hoe		3.60	pcs	7.2	pcs	
	Rammer		2.00	pcs	4.0	pcs	
	String		1.00	roll	1.0	roll	
	Whellbarrow		3.00	pcs	6.0	pcs	
	TOTAL REQUIRED TOOLS						
	Shovel				6.0		
	Pickaxe				6.0		
	Backet				12.0		
	Whellbarrow				12.0		
	String				1.0		
	Trowel				6.0		
	Builders level				2.0		
	Measuring tape	5m			2.0		