Table A-23 Financial Planning Table (Case B-1), (Risk 1 = Tariff Tsh. 900 and RCC Collection Rate 60%)

Year	Unit	1999	2000	2001	2002	2003	2004	2005	2006
1. Costs	million Tsh.	2045	1148	1580	2072	2424	2915	2352	0
1.1 Investment Cost	million Tsh.	1922	495	690	910	898	997	0	0
1.1.1 Skip Truck	million Tsh.	786	262	367	472	472	524	0	0
1.1.2 Container	million Tsh.	671	224	313	402	402	447	0	0
1.1.3 Push Cart	million Tsh.	23	9	10	36	24	26	0	0
1.1.4 Maintenance Shop	million Tsh.	442	0	0	0	0	0	0	0
1.2 Operation and Maintenance	million Tsh.	0	350	470	611	800	1001	1223	0
1.2.1 Labour (Primary)	million Tsh.	0	79	111	145	192	243	299	0
1.2.2 Repair (Primary)	million Tsh.	0	5	6	8	11	14	17	0
1.2.3 Labour (Secondary)	million Tsh.	0	11	14	19	26	32	40	0
1.2.4 Fuel (Secondary)	million Tsh.	0	69	92	125	167	209	255	0
1.2.5 Repair (Secondary)	million Tsh.	0	154	215	282	372	471	580	0
1.2.6 Maintenance Shop	million Tsh.	0	32	32	32	32	32	32	0
1.3 Disposal Fee	million Tsh.	107	218	304	399	527	667	822	0
1.4 Indirect Cost	million Tsh.	16	85	116	152	199	250	307	0
2. Revenues	million Tsh.	242	620	779	938	1206	1465	1750	2727
2.1 RCC from Households	million Tsh.	136	244	367	504	680	879	1102	0
2.1.1 Tariff	Tsh./month/household	900	900	900	900	900	900	900	0
2.1.2 Number of Households	numbers	277153	294312	314826	336878	360769	386270	414931	0
2.1.3 Waste Collection Rate	%	7.6	12.8	18.0	23.1	29.1	35.1	41.0	0.0
2.1.4 RCC Collection Rate	%	60.0	60.0	60.0	60.0	60.0	60.0	60.0	0.0
2.2 RCC from Others	million Tsh.	105	376	412	434	525	587	648	0
2.2.1 Tariff	Tsh./ton	24000	24000	24000	24000	24000	24000	24000	0
2.2.2 Amount of Waste Collected	ton/day	120	129	135	142	153	163	172	0
2.2.3 Waste Collection Rate	%	10.0	33.3	34.8	34.9	39.2	41.1	43.0	0.0
2.2.2 RCC Collection Rate	%	100.0	100.0	100.0	100.0	100.0	100.0	100.0	0.0
2.3 Subsidy from Disposal Fee	million Tsh.	0	0	0	0	0	0	0	0
2.4 Subsidy from Leasing Fee	million Tsh.	0	0	0	0	0	0	0	0
2.5 Scrap Value	million Tsh.	0	0	0	0	0	0	0	2727
3. Balance		-1803	-527	-801	-1133	-1218	-1450	-601	2727

Table A-24 Financial Planning Table (Case B-1), (Risk 2 = Tariff Tsh. 1100 and RCC Collection Rate 40%)

Year	Unit	1999	2000	2001	2002	2003	2004	2005	2006
1. Costs	million Tsh.	2045	1148	1580	2072	2424	2915	2352	0
1.1 Investment Cost	million Tsh.	1922	495	690	910	898	997	0	0
1.1.1 Skip Truck	million Tsh.	786	262	367	472	472	524	0	0
1.1.2 Container	million Tsh.	671	224	313	402	402	447	0	0
1.1.3 Push Cart	million Tsh.	23	9	10	36	24	26	0	0
1.1.4 Maintenance Shop	million Tsh.	442	0	0	0	0	0	0	0
1.2 Operation and Maintenance	million Tsh.	0	350	470	611	800	1001	1223	0
1.2.1 Labour (Primary)	million Tsh.	0	79	111	145	192	243	299	0
1.2.2 Repair (Primary)	million Tsh.	0	5	6	8	11	14	17	0
1.2.3 Labour (Secondary)	million Tsh.	0	11	14	19	26	32	40	0
1.2.4 Fuel (Secondary)	million Tsh.	0	69	92	125	167	209	255	0
1.2.5 Repair (Secondary)	million Tsh.	0	154	215	282	372	471	580	0
1.2.6 Maintenance Shop	million Tsh.	0	32	32	32	32	32	32	0
1.3 Disposal Fee	million Tsh.	107	218	304	399	527	667	822	0
1.4 Indirect Cost	million Tsh.	16	85	116	152	199	250	307	0
2. Revenues	million Tsh.	216	575	711	845	1080	1303	1546	2727
2.1 RCC from Households	million Tsh.	111	199	299	411	554	716	898	0
2.1.1 Tariff	Tsh./month/household	1100	1100	1100	1100	1100	1100	1100	0
2.1.2 Number of Households	numbers	277153	294312	314826	336878	360769	386270	414931	0
2.1.3 Waste Collection Rate	%	7.6	12.8	18.0	23.1	29.1	35.1	41.0	0.0
2.1.4 RCC Collection Rate	%	40.0	40.0	40.0	40.0	40.0	40.0	40.0	0.0
2.2 RCC from Others	million Tsh.	105	376	412	434	525	587	648	0
2.2.1 Tariff	Tsh./ton	24000	24000	24000	24000	24000	24000	24000	0
2.2.2 Amount of Waste Collected	ton/day	120	129	135	142	153	163	172	0
2.2.3 Waste Collection Rate	%	10.0	33.3	34.8	34.9	39.2	41.1	43.0	0.0
2.2.2 RCC Collection Rate	%	100.0	100.0	100.0	100.0	100.0	100.0	100.0	0.0
2.3 Subsidy from Disposal Fee	million Tsh.	0	0	0	0	0	0	0	0
2.4 Subsidy from Leasing Fee	million Tsh.	0	0	0	0	0	0	0	0
2.5 Scrap Value	million Tsh.	0	0	0	0	0	0	0	2727
3. Balance		-1828	-573	-869	-1227	-1344	-1612	-806	2727

Table A-25 Financial Planning Table (Case B-1). (Risk 3 = Tariff Tsh. 900 and RCC Collection Rate 40%)

Year	Unit	1999	2000	2001	2002	2003	2004	2005	2006
1. Costs	million Tsh.	2045	1148	1580	2072	2424	2915	2352	0
1.1 Investment Cost	million Tsh.	1922	495	690	910	898	997	0	0
1.1.1 Skip Truck	million Tsh.	786	262	367	472	472	524	0	0
1.1.2 Container	million Tsh.	671	224	313	402	402	447	0	0
1.1.3 Push Cart	million Tsh.	23	9	10	36	24	26	0	0
1.1.4 Maintenance Shop	million Tsh.	442	0	0	0	0	0	0	0
1.2 Operation and Maintenance	million Tsh.	0	350	470	611	800	1001	1223	0
1.2.1 Labour (Primary)	million Tsh.	0	79	111	145	192	243	299	0
1.2.2 Repair (Primary)	million Tsh.	0	5	6	8	11	14	17	0
1.2.3 Labour (Secondary)	million Tsh.	0	11	14	19	26	32	40	0
1.2.4 Fuel (Secondary)	million Tsh.	0	69	92	125	167	209	255	0
1.2.5 Repair (Secondary)	million Tsh.	0	154	215	282	372	471	580	0
1.2.6 Maintenance Shop	million Tsh.	0	32	32	32	32	32	32	0
1.3 Disposal Fee	million Tsh.	107	218	304	399	527	667	822	0
1.4 Indirect Cost	million Tsh.	16	85	116	152	199	250	307	0
2. Revenues	million Tsh.	196	539	656	770	979	1173	1383	2727
2.1 RCC from Households	million Tsh.	91	163	245	336	454	586	735	0
2.1.1 Tariff	Tsh./month/household	900	900	900	900	900	900	900	0
2.1.2 Number of Households	numbers	277153	294312	314826	336878	360769	386270	414931	0
2.1.3 Waste Collection Rate	%	7.6	12.8	18.0	23.1	29.1	35.1	41.0	0.0
2.1.4 RCC Collection Rate	%	40.0	40.0	40.0	40.0	40.0	40.0	40.0	0.0
2.2 RCC from Others	million Tsh.	105	376	412	434	525	587	648	0
2.2.1 Tariff	Tsh./ton	24000	24000	24000	24000	24000	24000	24000	0
2.2.2 Amount of Waste Collected	ton/day	120	129	135	142	153	163	172	0
2.2.3 Waste Collection Rate	%	10.0	33.3	34.8	34.9	39.2	41.1	43.0	0.0
2.2.2 RCC Collection Rate	%	100.0	100.0	100.0	100.0	100.0	100.0	100.0	0.0
2.3 Subsidy from Disposal Fee	million Tsh.	0	0	0	0	0	0	0	0
2.4 Subsidy from Leasing Fee	million Tsh.	0	0	0	0	0	0	0	0
2.5 Scrap Value	million Tsh.	0	0	0	0	0	0	0	2727
3. Balance		-1848	-609	-924	-1301	-1445	-1742	-969	2727

Table A-26 Financial Planning Table (Case B-2), (Base Case = Tariff Tsh. 1100 and RCC Collection Rate 60%)

Year	Unit	1999	2000	2001	2002	2003	2004	2005	2006
1. Costs	million Tsh.	1988	1032	1419	1860	2145	2561	1915	0
1.1 Investment Cost	million Tsh.	1922	495	690	910	898	997	0	0
1.1.1 Skip Truck	million Tsh.	786	262	367	472	472	524	0	0
1.1.2 Container	million Tsh.	671	224	313	402	402	447	0	0
1.1.3 Push Cart	million Tsh.	23	9	10	36	24	26	0	0
1.1.4 Maintenance Shop	million Tsh.	442	0	0	0	0	0	0	0
1.2 Operation and Maintenance	million Tsh.	0	350	470	611	800	1001	1223	0
1.2.1 Labour (Primary)	million Tsh.	0	79	111	145	192	243	299	0
1.2.2 Repair (Primary)	million Tsh.	0	5	6	8	11	14	17	0
1.2.3 Labour (Secondary)	million Tsh.	0	11	14	19	26	32	40	0
1.2.4 Fuel (Secondary)	million Tsh.	0	69	92	125	167	209	255	0
1.2.5 Repair (Secondary)	million Tsh.	0	154	215	282	372	471	580	0
1.2.6 Maintenance Shop	million Tsh.	0	32	32	32	32	32	32	0
1.3 Disposal Fee	million Tsh.	58	117	164	215	284	359	442	0
1.4 Indirect Cost	million Tsh.	9	70	95	124	163	204	250	0
2. Revenues	million Tsh.	272	675	860	1050	1357	1661	1995	2727
2.1 RCC from Households	million Tsh.	167	298	449	616	831	1074	1347	0
2.1.1 Tariff	Tsh./month/household	1100	1100	1100	1100	1100	1100	1100	0
2.1.2 Number of Households	numbers	277153	294312	314826	336878	360769	386270	414931	0
2.1.3 Waste Collection Rate	%	7.6	12.8	18.0	23.1	29.1	35.1	41.0	0.0
2.1.4 RCC Collection Rate	%	60.0	60.0	60.0	60.0	60.0	60.0	60.0	0.0
2.2 RCC from Others	million Tsh.	105	376	412	434	525	587	648	0
2.2.1 Tariff	Tsh./ton	24000	24000	24000	24000	24000	24000	24000	0
2.2.2 Amount of Waste Collected	ton/day	120	129	135	142	153	163	172	0
2.2.3 Waste Collection Rate	%	10.0	33.3	34.8	34.9	39.2	41.1	43.0	0.0
2.2.2 RCC Collection Rate	%	100.0	100.0	100.0	100.0	100.0	100.0	100.0	0.0
2.3 Subsidy from Disposal Fee	million Tsh.	0	0	0	0	0	0	0	0
2.4 Subsidy from Leasing Fee	million Tsh.	0	0	0	0	0	0	0	0
2.5 Scrap Value	million Tsh.	0	0	0	0	0	0	0	2727
3. Balance		-1716	-357	-559	-809	-788	-900	81	2727

Table A-27 Financial Planning Table (Case B-2), (Risk 1 = Tariff Tsh. 900 and RCC Collection Rate 60%)

Year	Unit	1999	2000	2001	2002	2003	2004	2005	2006
1. Costs	million Tsh.	1988	1032	1419	1860	2145	2561	1915	0
1.1 Investment Cost	million Tsh.	1922	495	690	910	898	997	0	0
1.1.1 Skip Truck	million Tsh.	786	262	367	472	472	524	0	0
1.1.2 Container	million Tsh.	671	224	313	402	402	447	0	0
1.1.3 Push Cart	million Tsh.	23	9	10	36	24	26	0	0
1.1.4 Maintenance Shop	million Tsh.	442	0	0	0	0	0	0	0
1.2 Operation and Maintenance	million Tsh.	0	350	470	611	800	1001	1223	0
1.2.1 Labour (Primary)	million Tsh.	0	79	111	145	192	243	299	0
1.2.2 Repair (Primary)	million Tsh.	0	5	6	8	11	14	17	0
1.2.3 Labour (Secondary)	million Tsh.	0	11	14	19	26	32	40	0
1.2.4 Fuel (Secondary)	million Tsh.	0	69	92	125	167	209	255	0
1.2.5 Repair (Secondary)	million Tsh.	0	154	215	282	372	471	580	0
1.2.6 Maintenance Shop	million Tsh.	0	32	32	32	32	32	32	0
1.3 Disposal Fee	million Tsh.	58	117	164	215	284	359	442	0
1.4 Indirect Cost	million Tsh.	9	70	95	124	163	204	250	0
2. Revenues	million Tsh.	242	620	779	938	1206	1465	1750	2727
2.1 RCC from Households	million Tsh.	136	244	367	504	680	879	1102	0
2.1.1 Tariff	Tsh./month/household	900	900	900	900	900	900	900	0
2.1.2 Number of Households	numbers	277153	294312	314826	336878	360769	386270	414931	0
2.1.3 Waste Collection Rate	%	7.6	12.8	18.0	23.1	29.1	35.1	41.0	0.0
2.1.4 RCC Collection Rate	%	60.0	60.0	60.0	60.0	60.0	60.0	60.0	0.0
2.2 RCC from Others	million Tsh.	105	376	412	434	525	587	648	0
2.2.1 Tariff	Tsh./ton	24000	24000	24000	24000	24000	24000	24000	0
2.2.2 Amount of Waste Collected	ton/day	120	129	135	142	153	163	172	0
2.2.3 Waste Collection Rate	%	10.0	33.3	34.8	34.9	39.2	41.1	43.0	0.0
2.2.2 RCC Collection Rate	%	100.0	100.0	100.0	100.0	100.0	100.0	100.0	0.0
2.3 Subsidy from Disposal Fee	million Tsh.	0	0	0	0	0	0	0	0
2.4 Subsidy from Leasing Fee	million Tsh.	0	0	0	0	0	0	0	0
2.5 Scrap Value	million Tsh.	0	0	0	0	0	0	0	2727
3. Balance		-1747	-411	-640	-922	-939	-1095	-164	2727

Table A-28 Financial Planning Table (Case B-2), (Risk 2 = Tariff Tsh. 1100 and RCC Collection Rate 40%)

Year	Unit	1999	2000	2001	2002	2003	2004	2005	2006
1. Costs	million Tsh.	1988	1032	1419	1860	2145	2561	1915	0
1.1 Investment Cost	million Tsh.	1922	495	690	910	898	997	0	0
1.1.1 Skip Truck	million Tsh.	786	262	367	472	472	524	0	0
1.1.2 Container	million Tsh.	671	224	313	402	402	447	0	0
1.1.3 Push Cart	million Tsh.	23	9	10	36	24	26	0	0
1.1.4 Maintenance Shop	million Tsh.	442	0	0	0	0	0	0	0
1.2 Operation and Maintenance	million Tsh.	0	350	470	611	800	1001	1223	0
1.2.1 Labour (Primary)	million Tsh.	0	79	111	145	192	243	299	0
1.2.2 Repair (Primary)	million Tsh.	0	5	6	8	11	14	17	0
1.2.3 Labour (Secondary)	million Tsh.	0	11	14	19	26	32	40	0
1.2.4 Fuel (Secondary)	million Tsh.	0	69	92	125	167	209	255	0
1.2.5 Repair (Secondary)	million Tsh.	0	154	215	282	372	471	580	0
1.2.6 Maintenance Shop	million Tsh.	0	32	32	32	32	32	32	0
1.3 Disposal Fee	million Tsh.	58	117	164	215	284	359	442	0
1.4 Indirect Cost	million Tsh.	9	70	95	124	163	204	250	0
2. Revenues	million Tsh.	216	575	711	845	1080	1303	1546	2727
2.1 RCC from Households	million Tsh.	111	199	299	411	554	716	898	0
2.1.1 Tariff	Tsh./month/household	1100	1100	1100	1100	1100	1100	1100	0
2.1.2 Number of Households	numbers	277153	294312	314826	336878	360769	386270	414931	0
2.1.3 Waste Collection Rate	%	7.6	12.8	18.0	23.1	29.1	35.1	41.0	0.0
2.1.4 RCC Collection Rate	%	40.0	40.0	40.0	40.0	40.0	40.0	40.0	0.0
2.2 RCC from Others	million Tsh.	105	376	412	434	525	587	648	0
2.2.1 Tariff	Tsh./ton	24000	24000	24000	24000	24000	24000	24000	0
2.2.2 Amount of Waste Collected	ton/day	120	129	135	142	153	163	172	0
2.2.3 Waste Collection Rate	%	10.0	33.3	34.8	34.9	39.2	41.1	43.0	0.0
2.2.2 RCC Collection Rate	%	100.0	100.0	100.0	100.0	100.0	100.0	100.0	0.0
2.3 Subsidy from Disposal Fee	million Tsh.	0	0	0	0	0	0	0	0
2.4 Subsidy from Leasing Fee	million Tsh.	0	0	0	0	0	0	0	0
2.5 Scrap Value	million Tsh.	0	0	0	0	0	0	0	2727
3. Balance		-1772	-457	-708	-1015	-1065	-1258	-369	2727

Table A-29 Financial Planning Table (Case B-2), (Risk 3 = Tariff Tsh. 900 and RCC Collection Rate 40%)

Year	Unit	1999	2000	2001	2002	2003	2004	2005	2006
1. Costs	million Tsh.	1988	1032	1419	1860	2145	2561	1915	0
1.1 Investment Cost	million Tsh.	1922	495	690	910	898	997	0	0
1.1.1 Skip Truck	million Tsh.	786	262	367	472	472	524	0	0
1.1.2 Container	million Tsh.	671	224	313	402	402	447	0	0
1.1.3 Push Cart	million Tsh.	23	9	10	36	24	26	0	0
1.1.4 Maintenance Shop	million Tsh.	442	0	0	0	0	0	0	0
1.2 Operation and Maintenance	million Tsh.	0	350	470	611	800	1001	1223	0
1.2.1 Labour (Primary)	million Tsh.	0	79	111	145	192	243	299	0
1.2.2 Repair (Primary)	million Tsh.	0	5	6	8	11	14	17	0
1.2.3 Labour (Secondary)	million Tsh.	0	11	14	19	26	32	40	0
1.2.4 Fuel (Secondary)	million Tsh.	0	69	92	125	167	209	255	0
1.2.5 Repair (Secondary)	million Tsh.	0	154	215	282	372	471	580	0
1.2.6 Maintenance Shop	million Tsh.	0	32	32	32	32	32	32	0
1.3 Disposal Fee	million Tsh.	58	117	164	215	284	359	442	0
1.4 Indirect Cost	million Tsh.	9	70	95	124	163	204	250	0
2. Revenues	million Tsh.	196	539	656	770	979	1173	1383	2727
2.1 RCC from Households	million Tsh.	91	163	245	336	454	586	735	0
2.1.1 Tariff	Tsh./month/household	900	900	900	900	900	900	900	0
2.1.2 Number of Households	numbers	277153	294312	314826	336878	360769	386270	414931	0
2.1.3 Waste Collection Rate	%	7.6	12.8	18.0	23.1	29.1	35.1	41.0	0.0
2.1.4 RCC Collection Rate	%	40.0	40.0	40.0	40.0	40.0	40.0	40.0	0.0
2.2 RCC from Others	million Tsh.	105	376	412	434	525	587	648	0
2.2.1 Tariff	Tsh./ton	24000	24000	24000	24000	24000	24000	24000	0
2.2.2 Amount of Waste Collected	ton/day	120	129	135	142	153	163	172	0
2.2.3 Waste Collection Rate	%	10.0	33.3	34.8	34.9	39.2	41.1	43.0	0.0
2.2.2 RCC Collection Rate	%	100.0	100.0	100.0	100.0	100.0	100.0	100.0	0.0
2.3 Subsidy from Disposal Fee	million Tsh.	0	0	0	0	0	0	0	0
2.4 Subsidy from Leasing Fee	million Tsh.	0	0	0	0	0	0	0	0
2.5 Scrap Value	million Tsh.	0	0	0	0	0	0	0	2727
3. Balance		-1792	-493	-763	-1090	-1166	-1388	-532	2727

Table A-30 Financial Planning Table (Case B-3), (Base Case = Tariff Tsh. 1100 and RCC Collection Rate 60%)

Year	Unit	1999	2000	2001	2002	2003	2004	2005	2006
1. Costs	million Tsh.	532	546	739	1860	2145	2561	1915	0
1.1 Investment Cost	million Tsh.	465	9	10	910	898	997	0	0
1.1.1 Skip Truck	million Tsh.	0	0	0	472	472	524	0	0
1.1.2 Container	million Tsh.	0	0	0	402	402	447	0	0
1.1.3 Push Cart	million Tsh.	23	9	10	36	24	26	0	0
1.1.4 Maintenance Shop	million Tsh.	442	0	0	0	0	0	0	0
1.2 Operation and Maintenance	million Tsh.	0	350	470	611	800	1001	1223	0
1.2.1 Labour (Primary)	million Tsh.	0	79	111	145	192	243	299	0
1.2.2 Repair (Primary)	million Tsh.	0	5	6	8	11	14	17	0
1.2.3 Labour (Secondary)	million Tsh.	0	11	14	19	26	32	40	0
1.2.4 Fuel (Secondary)	million Tsh.	0	69	92	125	167	209	255	0
1.2.5 Repair (Secondary)	million Tsh.	0	154	215	282	372	471	580	0
1.2.6 Maintenance Shop	million Tsh.	0	32	32	32	32	32	32	0
1.3 Disposal Fee	million Tsh.	58	117	164	215	284	359	442	0
1.4 Indirect Cost	million Tsh.	9	70	95	124	163	204	250	0
2. Revenues	million Tsh.	272	675	860	1050	1357	1661	1995	2089
2.1 RCC from Households	million Tsh.	167	298	449	616	831	1074	1347	0
2.1.1 Tariff	Tsh./month/household	1100	1100	1100	1100	1100	1100	1100	0
2.1.2 Number of Households	numbers	277153	294312	314826	336878	360769	386270	414931	0
2.1.3 Waste Collection Rate	%	7.6	12.8	18.0	23.1	29.1	35.1	41.0	0.0
2.1.4 RCC Collection Rate	%	60.0	60.0	60.0	60.0	60.0	60.0	60.0	0.0
2.2 RCC from Others	million Tsh.	105	376	412	434	525	587	648	0
2.2.1 Tariff	Tsh./ton	24000	24000	24000	24000	24000	24000	24000	0
2.2.2 Amount of Waste Collected	ton/day	120	129	135	142	153	163	172	0
2.2.3 Waste Collection Rate	%	10.0	33.3	34.8	34.9	39.2	41.1	43.0	0.0
2.2.2 RCC Collection Rate	%	100.0	100.0	100.0	100.0	100.0	100.0	100.0	0.0
2.3 Subsidy from Disposal Fee	million Tsh.	0	0	0	0	0	0	0	0
2.4 Subsidy from Leasing Fee	million Tsh.	0	0	0	0	0	0	0	0
2.5 Scrap Value	million Tsh.	0	0	0	0	0	0	0	2089
3. Balance		-260	129	121	-809	-788	-900	81	2089

Table A-31 Financial Planning Table (Case B-3), (Risk 1 = Tariff Tsh. 900 and RCC Collection Rate 60%)

Year	Unit	1999	2000	2001	2002	2003	2004	2005	2006
1. Costs	million Tsh.	532	546	739	1860	2145	2561	1915	0
1.1 Investment Cost	million Tsh.	465	9	10	910	898	997	0	0
1.1.1 Skip Truck	million Tsh.	0	0	0	472	472	524	0	0
1.1.2 Container	million Tsh.	0	0	0	402	402	447	0	0
1.1.3 Push Cart	million Tsh.	23	9	10	36	24	26	0	0
1.1.4 Maintenance Shop	million Tsh.	442	0	0	0	0	0	0	0
1.2 Operation and Maintenance	million Tsh.	0	350	470	611	800	1001	1223	0
1.2.1 Labour (Primary)	million Tsh.	0	79	111	145	192	243	299	0
1.2.2 Repair (Primary)	million Tsh.	0	5	6	8	11	14	17	0
1.2.3 Labour (Secondary)	million Tsh.	0	11	14	19	26	32	40	0
1.2.4 Fuel (Secondary)	million Tsh.	0	69	92	125	167	209	255	0
1.2.5 Repair (Secondary)	million Tsh.	0	154	215	282	372	471	580	0
1.2.6 Maintenance Shop	million Tsh.	0	32	32	32	32	32	32	0
1.3 Disposal Fee	million Tsh.	58	117	164	215	284	359	442	0
1.4 Indirect Cost	million Tsh.	9	70	95	124	163	204	250	0
2. Revenues	million Tsh.	242	620	779	938	1206	1465	1750	2089
2.1 RCC from Households	million Tsh.	136	244	367	504	680	879	1102	0
2.1.1 Tariff	Tsh./month/household	900	900	900	900	900	900	900	0
2.1.2 Number of Households	numbers	277153	294312	314826	336878	360769	386270	414931	0
2.1.3 Waste Collection Rate	%	7.6	12.8	18.0	23.1	29.1	35.1	41.0	0.0
2.1.4 RCC Collection Rate	%	60.0	60.0	60.0	60.0	60.0	60.0	60.0	0.0
2.2 RCC from Others	million Tsh.	105	376	412	434	525	587	648	0
2.2.1 Tariff	Tsh./ton	24000	24000	24000	24000	24000	24000	24000	0
2.2.2 Amount of Waste Collected	ton/day	120	129	135	142	153	163	172	0
2.2.3 Waste Collection Rate	%	10.0	33.3	34.8	34.9	39.2	41.1	43.0	0.0
2.2.2 RCC Collection Rate	%	100.0	100.0	100.0	100.0	100.0	100.0	100.0	0.0
2.3 Subsidy from Disposal Fee	million Tsh.	0	0	0	0	0	0	0	0
2.4 Subsidy from Leasing Fee	million Tsh.	0	0	0	0	0	0	0	0
2.5 Scrap Value	million Tsh.	0	0	0	0	0	0	0	2089
3. Balance		-290	74	40	-922	-939	-1095	-164	2089

Table A-32 Financial Planning Table (Case B-3), (Risk 2 = Tariff Tsh. 1100 and RCC Collection Rate 40%)

Year	Unit	1999	2000	2001	2002	2003	2004	2005	2006
1. Costs	million Tsh.	532	546	739	1860	2145	2561	1915	0
1.1 Investment Cost	million Tsh.	465	9	10	910	898	997	0	0
1.1.1 Skip Truck	million Tsh.	0	0	0	472	472	524	0	0
1.1.2 Container	million Tsh.	0	0	0	402	402	447	0	0
1.1.3 Push Cart	million Tsh.	23	9	10	36	24	26	0	0
1.1.4 Maintenance Shop	million Tsh.	442	0	0	0	0	0	0	0
1.2 Operation and Maintenance	million Tsh.	0	350	470	611	800	1001	1223	0
1.2.1 Labour (Primary)	million Tsh.	0	79	111	145	192	243	299	0
1.2.2 Repair (Primary)	million Tsh.	0	5	6	8	11	14	17	0
1.2.3 Labour (Secondary)	million Tsh.	0	11	14	19	26	32	40	0
1.2.4 Fuel (Secondary)	million Tsh.	0	69	92	125	167	209	255	0
1.2.5 Repair (Secondary)	million Tsh.	0	154	215	282	372	471	580	0
1.2.6 Maintenance Shop	million Tsh.	0	32	32	32	32	32	32	0
1.3 Disposal Fee	million Tsh.	58	117	164	215	284	359	442	0
1.4 Indirect Cost	million Tsh.	9	70	95	124	163	204	250	0
2. Revenues	million Tsh.	216	575	711	845	1080	1303	1546	2089
2.1 RCC from Households	million Tsh.	111	199	299	411	554	716	898	0
2.1.1 Tariff	Tsh./month/household	1100	1100	1100	1100	1100	1100	1100	0
2.1.2 Number of Households	numbers	277153	294312	314826	336878	360769	386270	414931	0
2.1.3 Waste Collection Rate	%	7.6	12.8	18.0	23.1	29.1	35.1	41.0	0.0
2.1.4 RCC Collection Rate	%	40.0	40.0	40.0	40.0	40.0	40.0	40.0	0.0
2.2 RCC from Others	million Tsh.	105	376	412	434	525	587	648	0
2.2.1 Tariff	Tsh./ton	24000	24000	24000	24000	24000	24000	24000	0
2.2.2 Amount of Waste Collected	ton/day	120	129	135	142	153	163	172	0
2.2.3 Waste Collection Rate	%	10.0	33.3	34.8	34.9	39.2	41.1	43.0	0.0
2.2.2 RCC Collection Rate	%	100.0	100.0	100.0	100.0	100.0	100.0	100.0	0.0
2.3 Subsidy from Disposal Fee	million Tsh.	0	0	0	0	0	0	0	0
2.4 Subsidy from Leasing Fee	million Tsh.	0	0	0	0	0	0	0	0
2.5 Scrap Value	million Tsh.	0	0	0	0	0	0	0	2089
3. Balance		-315	29	-28	-1015	-1065	-1258	-369	2089

Table A-33 Financial Planning Table (Case B-3), (Risk 3 = Tariff Tsh. 900 and RCC Collection Rate 40%)

Year	Unit	1999	2000	2001	2002	2003	2004	2005	2006
1. Costs	million Tsh.	532	546	739	1860	2145	2561	1915	0
1.1 Investment Cost	million Tsh.	465	9	10	910	898	997	0	0
1.1.1 Skip Truck	million Tsh.	0	0	0	472	472	524	0	0
1.1.2 Container	million Tsh.	0	0	0	402	402	447	0	0
1.1.3 Push Cart	million Tsh.	23	9	10	36	24	26	0	0
1.1.4 Maintenance Shop	million Tsh.	442	0	0	0	0	0	0	0
1.2 Operation and Maintenance	million Tsh.	0	350	470	611	800	1001	1223	0
1.2.1 Labour (Primary)	million Tsh.	0	79	111	145	192	243	299	0
1.2.2 Repair (Primary)	million Tsh.	0	5	6	8	11	14	17	0
1.2.3 Labour (Secondary)	million Tsh.	0	11	14	19	26	32	40	0
1.2.4 Fuel (Secondary)	million Tsh.	0	69	92	125	167	209	255	0
1.2.5 Repair (Secondary)	million Tsh.	0	154	215	282	372	471	580	0
1.2.6 Maintenance Shop	million Tsh.	0	32	32	32	32	32	32	0
1.3 Disposal Fee	million Tsh.	58	117	164	215	284	359	442	0
1.4 Indirect Cost	million Tsh.	9	70	95	124	163	204	250	0
2. Revenues	million Tsh.	196	539	656	770	979	1173	1383	2089
2.1 RCC from Households	million Tsh.	91	163	245	336	454	586	735	0
2.1.1 Tariff	Tsh./month/household	900	900	900	900	900	900	900	0
2.1.2 Number of Households	numbers	277153	294312	314826	336878	360769	386270	414931	0
2.1.3 Waste Collection Rate	%	7.6	12.8	18.0	23.1	29.1	35.1	41.0	0.0
2.1.4 RCC Collection Rate	%	40.0	40.0	40.0	40.0	40.0	40.0	40.0	0.0
2.2 RCC from Others	million Tsh.	105	376	412	434	525	587	648	0
2.2.1 Tariff	Tsh./ton	24000	24000	24000	24000	24000	24000	24000	0
2.2.2 Amount of Waste Collected	ton/day	120	129	135	142	153	163	172	0
2.2.3 Waste Collection Rate	%	10.0	33.3	34.8	34.9	39.2	41.1	43.0	0.0
2.2.2 RCC Collection Rate	%	100.0	100.0	100.0	100.0	100.0	100.0	100.0	0.0
2.3 Subsidy from Disposal Fee	million Tsh.	0	0	0	0	0	0	0	0
2.4 Subsidy from Leasing Fee	million Tsh.	0	0	0	0	0	0	0	0
2.5 Scrap Value	million Tsh.	0	0	0	0	0	0	0	2089
3. Balance		-336	-7	-83	-1090	-1166	-1388	-532	2089

Table A-34 FIRR (Case A-1, Base Case) FIRR = -7.63%

Project Year	Financial Year	Investment	O & M	Cost	Benefit	Net Benefit	Cumulative Net Benefit
1	1999	4,208	2,279	6,487	2,410	-4,077	-4,077
2	2000	968	2,671	3,640	3,021	-619	-4,696
3	2001	1,042	3,280	4,323	3,680	-642	-5,338
4	2002	1,340	3,951	5,291	4,519	-772	-6,110
5	2003	1,577	4,812	6,389	5,370	-1,018	-7,129
6	2004	1,676	5,792	7,468	6,400	-1,068	-8,196
7	2005	0	6,767	6,767	7,612	844	-7,352
8	2006	0	0	0	4,653	4,653	-2,700

Table A-35 FIRR (Case A-2, Base Case) FIRR = 5.56%

Project Year	Financial Year	Investment	O & M	Cost	Benefit	Net Benefit	Cumulative Net Benefit
1	1999	4,208	1,956	6,163	2,410	-3,753	-3,753
2	2000	968	2,261	3,230	3,021	-209	-3,962
3	2001	1,042	2,776	3,818	3,680	-138	-4,100
4	2002	1,340	3,344	4,683	4,519	-165	-4,264
5	2003	1,577	4,068	5,645	5,370	-275	-4,539
6	2004	1,676	4,894	6,570	6,400	-170	-4,710
7	2005	0	5,702	5,702	7,612	1,909	-2,800
8	2006	0	0	0	4,653	4,653	1,852

Table A-36 FIRR (Case B-1, Base Case) FIRR = -20.47%

Project Year	Financial Year	Investment	O & M	Cost	Benefit	Net Benefit	Cumulative Net Benefit
1	1999	1,922	123	2,045	272	-1,773	-1,773
2	2000	495	653	1,148	675	-473	-2,246
3	2001	690	890	1,580	860	-720	-2,965
4	2002	910	1,162	2,072	1,050	-1,021	-3,987
5	2003	898	1,526	2,424	1,357	-1,067	-5,054
6	2004	997	1,918	2,915	1,661	-1,254	-6,308
7	2005	0	2,352	2,352	1,995	-356	-6,665
8	2006	0	0	0	2,727	2,727	-3,937

Table A-37 FIRR (Case B-2, Base Case) FIRR = -12.61%

Project Year	Financial Year	Investment	O & M	Cost	Benefit	Net Benefit ⑤=④-③	Cumulative Net Benefit
1	1999	1,922	67	1,988	272	-1,716	-1,716
2	2000	495	537	1,032	675	-357	-2,073
3	2001	690	729	1,419	860	-559	-2,632
4	2002	910	950	1,860	1,050	-809	-3,441
5	2003	898	1,247	2,145	1,357	-788	-4,229
6	2004	997	1,564	2,561	1,661	-900	-5,129
7	2005	0	1,915	1,915	1,995	81	-5,049
8	2006	0	0	0	2,727	2,727	-2,322

Table A-38 FIRR (Case B-3, Base Case) FIRR = -4.63%

Project Year	Financial Year	Investment	O & M	Cost	Benefit	Net Benefit ⑤=④-③	Cumulative Net Benefit
1	1999	465	67	532	272	-260	-260
2	2000	9	537	546	675	129	-131
3	2001	10	729	739	860	121	-10
4	2002	910	950	1,860	1,050	-809	-819
5	2003	898	1,247	2,145	1,357	-788	-1,607
6	2004	997	1,564	2,561	1,661	-900	-2,507
7	2005	0	1,915	1,915	1,995	81	-2,427
8	2006	0	0	0	2,089	2,089	-338

Table A-39 FIRR (Case A-1, Risk 1) FIRR = -14.97%

Project Year	Financial Year	Investment	O & M	Cost	Benefit	Net Benefit	Cumulative Net Benefit
1	1999	4,208	2,279	6,487	2,225	-4,262	-4,262
2	2000	968	2,671	3,640	2,784	-856	-5,118
3	2001	1,042	3,280	4,323	3,382	-940	-6,058
4	2002	1,340	3,951	5,291	4,149	-1,142	-7,200
5	2003	1,577	4,812	6,389	4,915	-1,474	-8,674
6	2004	1,676	5,792	7,468	5,842	-1,626	-10,299
7	2005	0	6,767	6,767	6,930	162	-10,137
8	2006	0	0	0	4,653	4,653	-5,484

Table A-40 FIRR (Case A-2, Risk 1) FIRR = -2.71%

Project Year	Financial Year	Investment	O & M	Cost	Benefit	Net Benefit	Cumulative Net Benefit
1	1999	4,208	1,956	6,163	2,225	-3,938	-3,938
2	2000	968	2,261	3,230	2,784	-446	-4,384
3	2001	1,042	2,776	3,818	3,382	-436	-4,820
4	2002	1,340	3,344	4,683	4,149	-534	-5,354
5	2003	1,577	4,068	5,645	4,915	-730	-6,084
6	2004	1,676	4,894	6,570	5,842	-728	-6,812
7	2005	0	5,702	5,702	6,930	1,227	-5,585
8	2006	0	0	0	4,653	4,653	-933

Table A-41 FIRR (Case B-1, Risk 1) FIRR = -24.43%

Project Year	Financial Year	Investment	O & M	Cost	Benefit	Net Benefit	Cumulative Net Benefit
1	1999	1,922	123	2,045	242	-1,803	-1,803
2	2000	495	653	1,148	620	-527	-2,330
3	2001	690	890	1,580	779	-801	-3,132
4	2002	910	1,162	2,072	938	-1,133	-4,265
5	2003	898	1,526	2,424	1,206	-1,218	-5,483
6	2004	997	1,918	2,915	1,465	-1,450	-6,933
7	2005	0	2,352	2,352	1,750	-601	-7,534
8	2006	0	0	0	2,727	2,727	-4,807

Table A-42 FIRR (Case B-2, Risk 1) FIRR = -16.99%

Project Year	Financial Year	Investment	O & M	Cost	Benefit	Net Benefit ⑤=④-③	Cumulative Net Benefit
1	1999	1,922	67	1,988	242	-1,747	-1,747
2	2000	495	537	1,032	620	-411	-2,158
3	2001	690	729	1,419	779	-640	-2,798
4	2002	910	950	1,860	938	-922	-3,720
5	2003	898	1,247	2,145	1,206	-939	-4,659
6	2004	997	1,564	2,561	1,465	-1,095	-5,754
7	2005	0	1,915	1,915	1,750	-164	-5,919
8	2006	0	0	0	2,727	2,727	-3,191

Table A-43 FIRR (Case B-3, Risk 1) FIRR = -14.23%

Project Year	Financial Year	Investment	O & M	Cost	Benefit	Net Benefit ⑤=④-③	Cumulative Net Benefit
1	1999	465	67	532	242	-290	-290
2	2000	9	537	546	620	74	-216
3	2001	10	729	739	779	40	-176
4	2002	910	950	1,860	938	-922	-1,098
5	2003	898	1,247	2,145	1,206	-939	-2,037
6	2004	997	1,564	2,561	1,465	-1,095	-3,132
7	2005	0	1,915	1,915	1,750	-164	-3,296
8	2006	0	0	0	2,089	2,089	-1,207

Table A-44 FIRR (Case A-1, Risk 2) FIRR = -19.71%

Project Year	Financial Year	Investment	O & M	Cost	Benefit	Net Benefit	Cumulative Net Benefit
1	1999	4,208	2,279	6,487	2,086	-4,401	-4,401
2	2000	968	2,671	3,640	2,606	-1,034	-5,434
3	2001	1,042	3,280	4,323	3,420	-903	-6,337
4	2002	1,340	3,951	5,291	3,872	-1,419	-7,756
5	2003	1,577	4,812	6,389	4,573	-1,815	-9,572
6	2004	1,676	5,792	7,468	5,423	-2,044	-11,616
7	2005	0	6,767	6,767	6,418	-349	-11,965
8	2006	0	0	0	4,653	4,653	-7,312

Table A-45 FIRR (Case A-2, Risk 2) FIRR = -7.97%

Project Year	Financial Year	Investment	O & M	Cost	Benefit	Net Benefit	Cumulative Net Benefit
1	1999	4,208	1,956	6,163	2,086	-4,077	-4,077
2	2000	968	2,261	3,230	2,606	-624	-4,701
3	2001	1,042	2,776	3,818	3,420	-398	-5,099
4	2002	1,340	3,344	4,683	3,872	-811	-5,911
5	2003	1,577	4,068	5,645	4,573	-1,071	-6,982
6	2004	1,676	4,894	6,570	5,423	-1,147	-8,129
7	2005	0	5,702	5,702	6,418	716	-7,413
8	2006	0	0	0	4,653	4,653	-2,761

Table A-46 FIRR (Case B-1, Risk 3) FIRR = -27.55%

Project Year	Financial Year	Investment	O & M	Cost	Benefit	Net Benefit	Cumulative Net Benefit
1	1999	1,922	123	2,045	216	-1,828	-1,828
2	2000	495	653	1,148	575	-573	-2,401
3	2001	690	890	1,580	711	-869	-3,270
4	2002	910	1,162	2,072	845	-1,227	-4,497
5	2003	898	1,526	2,424	1,080	-1,344	-5,841
6	2004	997	1,918	2,915	1,303	-1,612	-7,453
7	2005	0	2,352	2,352	1,546	-806	-8,259
8	2006	0	0	0	2,727	2,727	-5,532

Table A-47 FIRR (Case B-2, Risk 2) FIRR = -20.48%

Project Year	Financial Year	Investment	O & M	Cost	Benefit	Net Benefit ⑤=④-③	Cumulative Net Benefit
1	1999	1,922	67	1,988	216	-1,772	-1,772
2	2000	495	537	1,032	575	-457	-2,228
3	2001	690	729	1,419	711	-708	-2,937
4	2002	910	950	1,860	845	-1,015	-3,952
5	2003	898	1,247	2,145	1,080	-1,065	-5,017
6	2004	997	1,564	2,561	1,303	-1,258	-6,275
7	2005	0	1,915	1,915	1,546	-369	-6,643
8	2006	0	0	0	2,727	2,727	-3,916

Table A-48 FIRR (Case B-3, Risk 2) FIRR = -20.56%

Project Year	Financial Year	Investment	O & M	Cost	Benefit	Net Benefit ⑤=④-③	Cumulative Net Benefit
1	1999	465	67	532	216	-315	-315
2	2000	9	537	546	575	29	-286
3	2001	10	729	739	711	-28	-315
4	2002	910	950	1,860	845	-1,015	-1,329
5	2003	898	1,247	2,145	1,080	-1,065	-2,394
6	2004	997	1,564	2,561	1,303	-1,258	-3,652
7	2005	0	1,915	1,915	1,546	-369	-4,021
8	2006	0	0	0	2,089	2,089	-1,932

Table A-49 FIRR (Case A-1, Risk 3) FIRR = -24.88%

Project Year	Financial Year	Investment	O & M	Cost	Benefit	Net Benefit	Cumulative Net Benefit
1	1999	4,208	2,279	6,487	1,948	-4,539	-4,539
2	2000	968	2,671	3,640	2,428	-1,212	-5,751
3	2001	1,042	3,280	4,323	2,936	-1,387	-7,138
4	2002	1,340	3,951	5,291	3,595	-1,696	-8,834
5	2003	1,577	4,812	6,389	4,232	-2,157	-10,991
6	2004	1,676	5,792	7,468	5,005	-2,463	-13,454
7	2005	0	6,767	6,767	5,907	-861	-14,314
8	2006	0	0	0	4,653	4,653	-9,662

Table A-50 FIRR (Case A-2, Risk 3) FIRR = -14.12%

Project Year	Financial Year	Investment	O & M	Cost	Benefit	Net Benefit	Cumulative Net Benefit
1	1999	4,208	1,956	6,163	1,948	-4,216	-4,216
2	2000	968	2,261	3,230	2,428	-802	-5,017
3	2001	1,042	2,776	3,818	2,936	-883	-5,900
4	2002	1,340	3,344	4,683	3,595	-1,089	-6,989
5	2003	1,577	4,068	5,645	4,232	-1,413	-8,402
6	2004	1,676	4,894	6,570	5,005	-1,565	-9,967
7	2005	0	5,702	5,702	5,907	204	-9,763
8	2006	0	0	0	4,653	4,653	-5,110

Table A-51 FIRR (Case B-1, Risk 3) FIRR = -29.92%

Project Year	Financial Year	Investment	O & M	Cost	Benefit	Net Benefit	Cumulative Net Benefit
1	1999	1,922	123	2,045	196	-1,848	-1,848
2	2000	495	653	1,148	539	-609	-2,457
3	2001	690	890	1,580	656	-924	-3,381
4	2002	910	1,162	2,072	770	-1,301	-4,682
5	2003	898	1,526	2,424	979	-1,445	-6,127
6	2004	997	1,918	2,915	1,173	-1,742	-7,870
7	2005	0	2,352	2,352	1,383	-969	-8,839
8	2006	0	0	0	2,727	2,727	-6,111

Table A-52 FIRR (Case B-2, Risk 3) FIRR = -23.15%

Project Year	Financial Year	Investment	O & M	Cost	Benefit	Net Benefit ⑤=④-③	Cumulative Net Benefit
1	1999	1,922	67	1,988	196	-1,792	-1,792
2	2000	495	537	1,032	539	-493	-2,285
3	2001	690	729	1,419	656	-763	-3,047
4	2002	910	950	1,860	770	-1,090	-4,137
5	2003	898	1,247	2,145	979	-1,166	-5,303
6	2004	997	1,564	2,561	1,173	-1,388	-6,691
7	2005	0	1,915	1,915	1,383	-532	-7,223
8	2006	0	0	0	2,727	2,727	-4,496

Table A-53 FIRR (Case B-3, Risk 3) FIRR = -24.90%

Project Year	Financial Year	Investment	O & M	Cost	Benefit	Net Benefit ⑤=④-③	Cumulative Net Benefit
1	1999	465	67	532	196	-336	-336
2	2000	9	537	546	539	-7	-343
3	2001	10	729	739	656	-83	-425
4	2002	910	950	1,860	770	-1,090	-1,515
5	2003	898	1,247	2,145	979	-1,166	-2,681
6	2004	997	1,564	2,561	1,173	-1,388	-4,069
7	2005	0	1,915	1,915	1,383	-532	-4,601
8	2006	0	0	0	2,089	2,089	-2,512

Figure A-7 Transition of Net Cumulative Benefit (Case A-1)

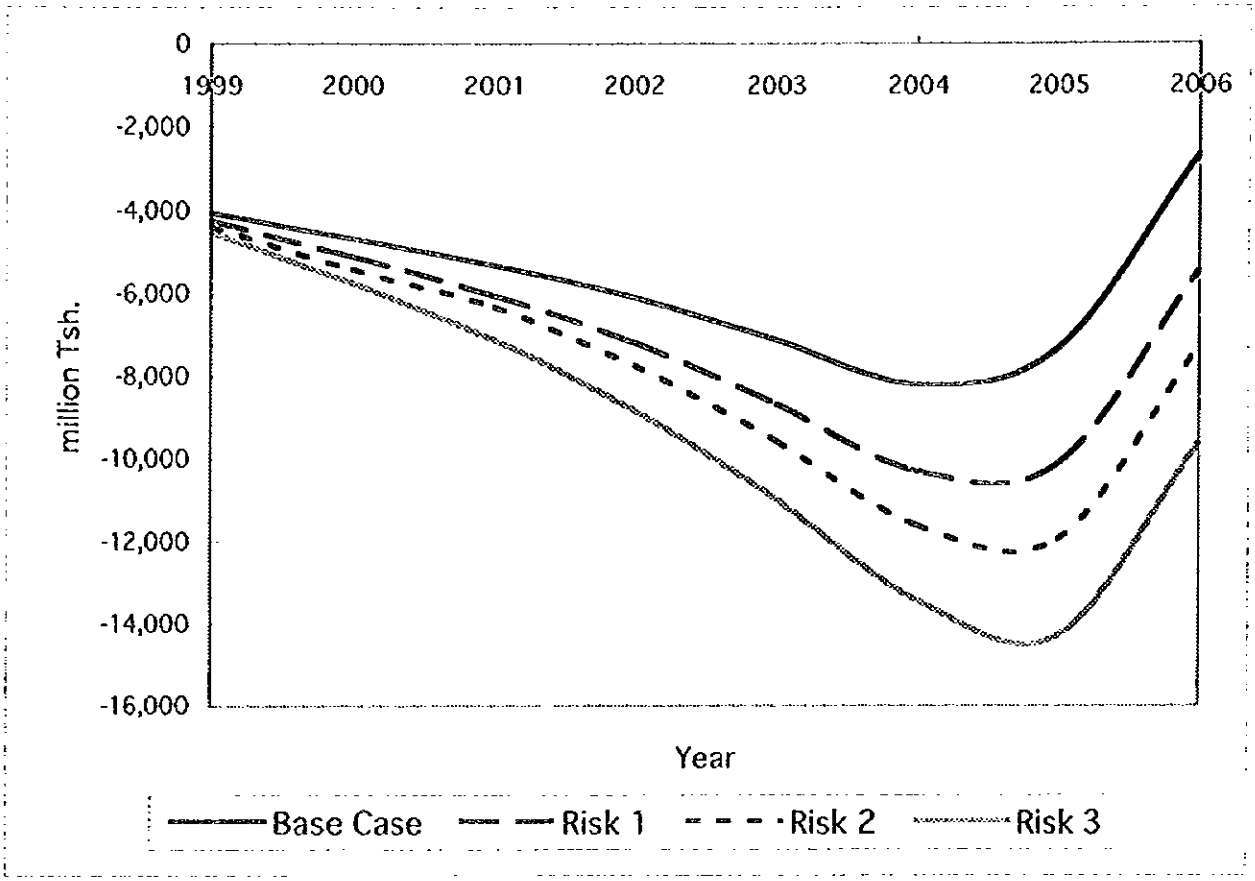


Table A-8 Transition of Net Cumulative Benefit (Case A-2)

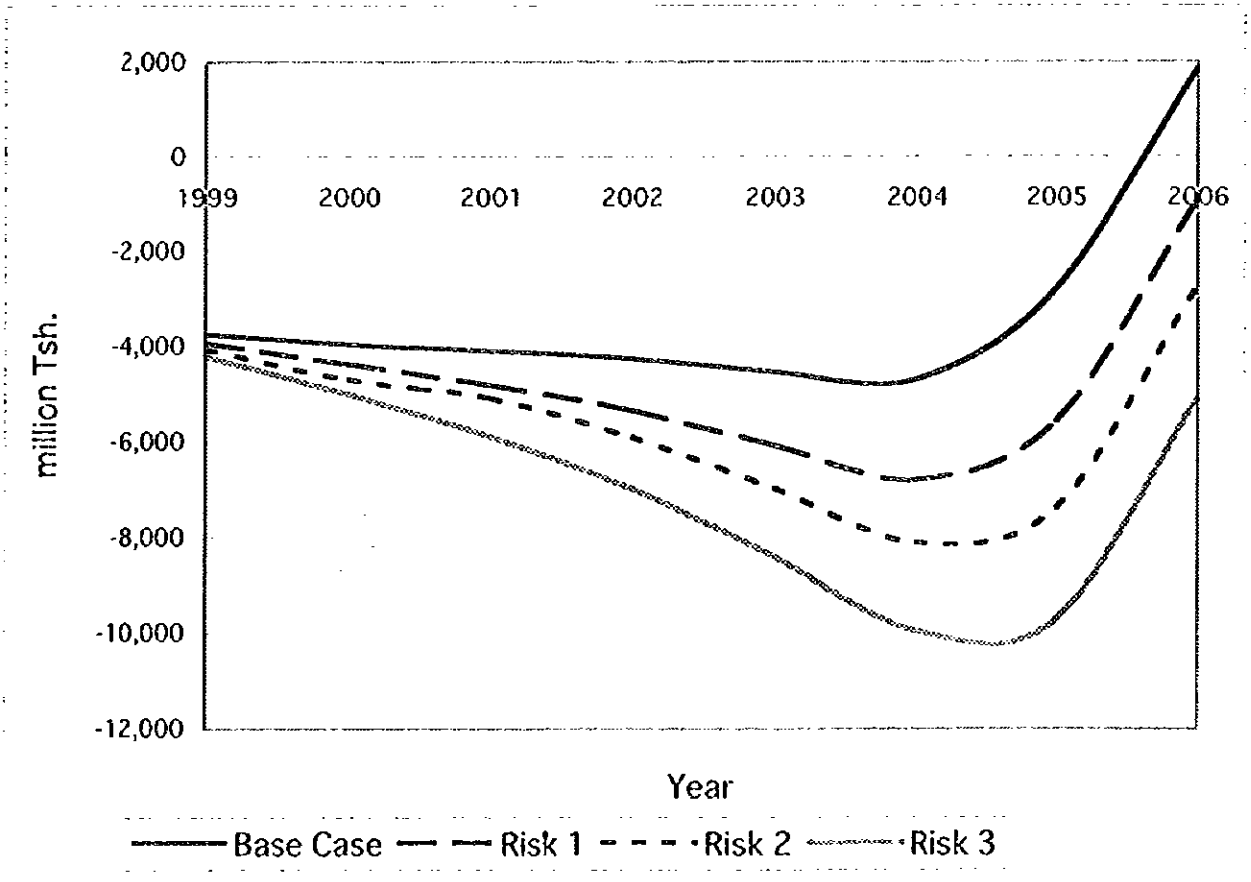


Table A-9 Transition of Net Cumulative Benefit (Case B-1)

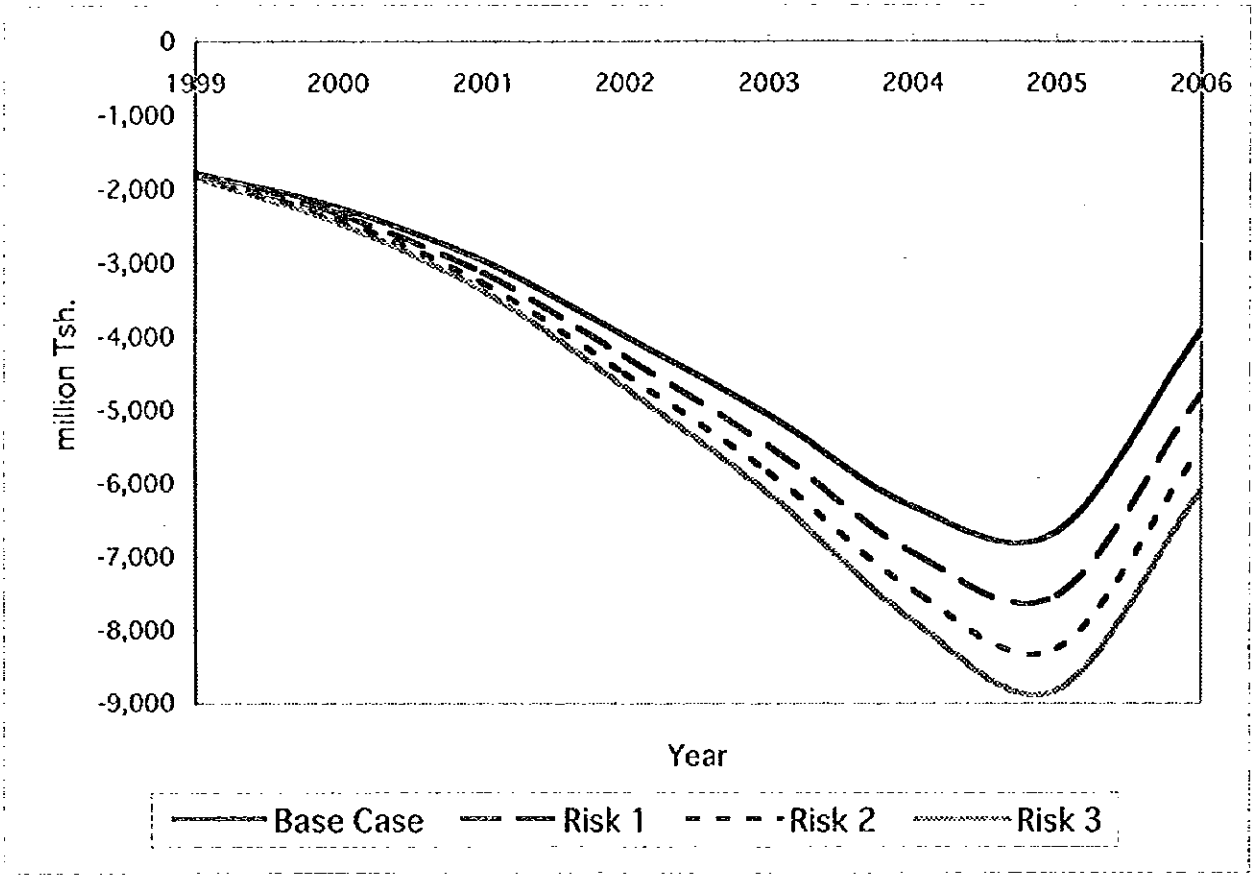


Table A-10 Transition of Net Cumulative Benefit (Case B-2)

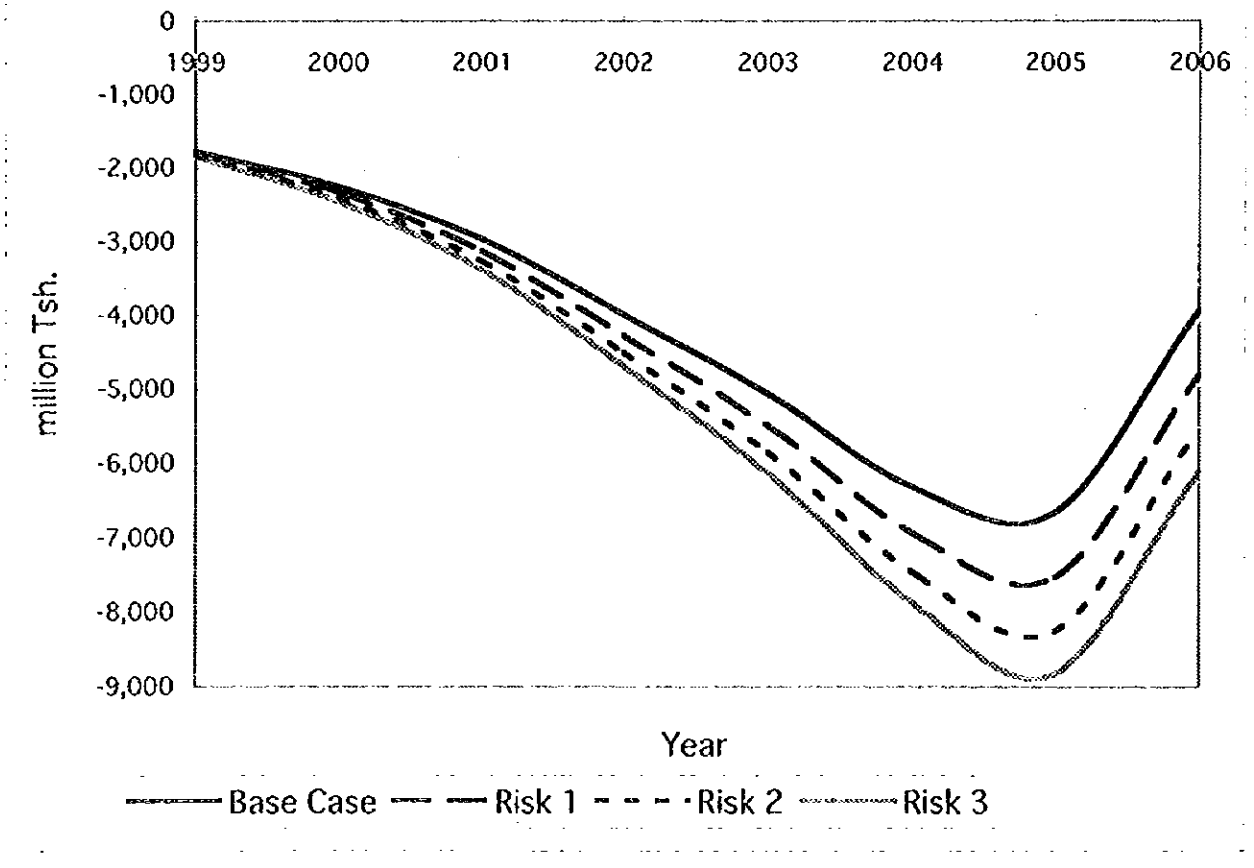


Table A-54 Break-even Point Analysis for Area A

RCC Collection (%)	Cut-off Rate (%)	FIRR (%)	Subsidized FIRR (%)
100.0	13.2	21.28	28.92
90.0	13.2	13.22	20.86
80.0	13.2	5.56	13.20
70.0	13.2	-1.71	5.93
60.0	13.2	-8.57	-0.93
50.0	13.2	-15.01	-7.37
40.0	13.2	-21.00	-13.36
30.0	13.2	-26.51	-18.87
20.0	13.2	-31.54	-23.90
10.0	13.2	-36.10	-28.46
0.0	13.2	-40.22	-32.58

Figure A-11 Break-even Point Analysis for Area A

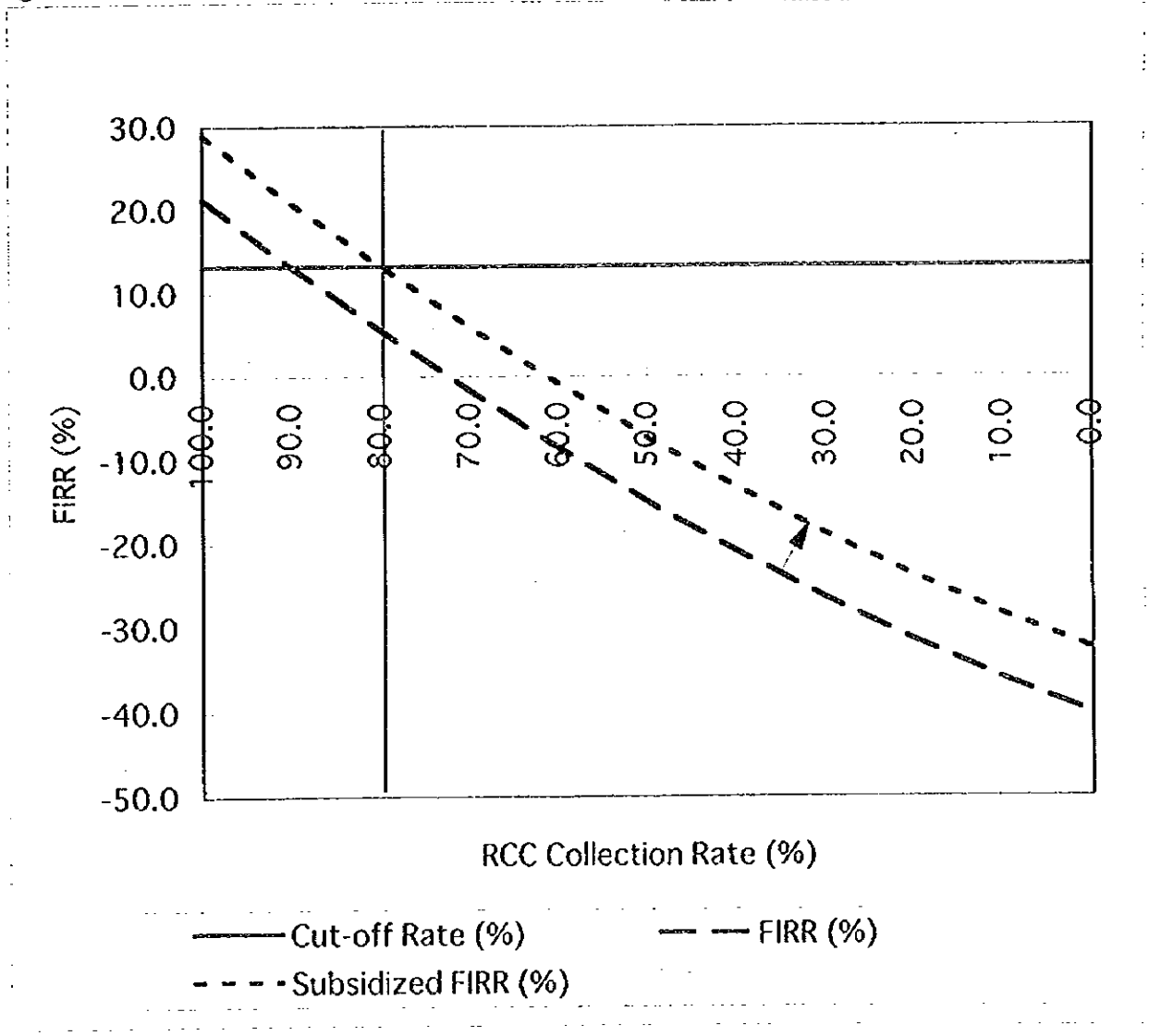


Table A-55 Break-even Point Analysis for Area B

RCC Collection (%)	Cut-off Rate (%)	FIRR (%)	Subsidized FIRR (%)
100.0	13.2	-4.17	16.30
90.0	13.2	-8.48	11.99
80.0	13.2	-12.64	7.83
70.0	13.2	-16.65	3.82
60.0	13.2	-20.47	0.00
50.0	13.2	-24.11	-3.64
40.0	13.2	-27.55	-7.08
30.0	13.2	-30.79	-10.32
20.0	13.2	-33.83	-13.36
10.0	13.2	-36.68	-16.21
0.0	13.2	-39.35	-18.88

Figure A-12 Break-even Point Analysis for Area B

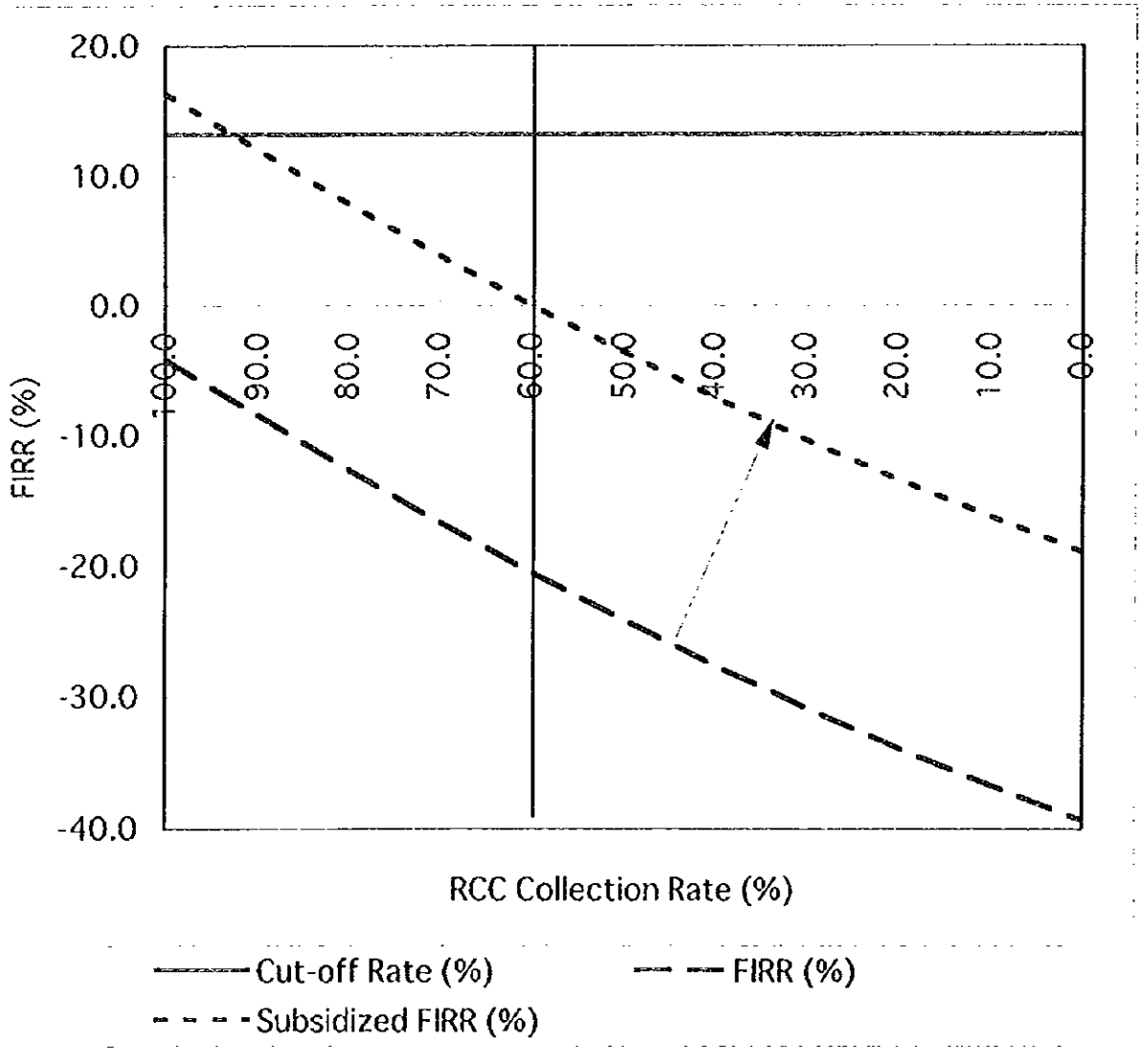


Table A-56 Calculation Table for Grant Aid Requirement (Area A), (Base Case = Tariff Tsh. 1400 and RCC Collection Rate 80%)

Year	Unit	1999	2000	2001	2002	2003	2004	2005	2006
1. Costs	million Tsh.	6163	3230	3818	4683	5645	6570	5702	0
1.1 Investment Cost	million Tsh.	4208	968	1042	1340	1577	1676	0	0
1.1.1 Tipper Truck	million Tsh.	4208	968	1042	1042	1527	1676	0	0
1.1.2 Compactor Truck	million Tsh.	0	0	0	297	50	0	0	0
1.2 Operation and Maintenance	million Tsh.	1185	1502	1849	2224	2702	3259	3863	0
1.2.1 Labour	million Tsh.	278	352	434	521	621	751	891	0
1.2.2 Fuel	million Tsh.	244	310	382	459	552	667	790	0
1.2.3 Repair	million Tsh.	663	840	1033	1244	1529	1841	2182	0
1.3 Disposal Fee	million Tsh.	326	414	509	613	752	906	1074	0
1.4 Indirect Cost	million Tsh.	151	192	236	284	345	417	494	0
1.5 Tax	million Tsh.	293	154	182	223	269	313	272	0
2. Revenues	million Tsh.	2410	3140	3829	4888	5825	6958	8670	4653
2.1 RCC from Households	million Tsh.	1295	1778	2235	2957	3643	4463	5832	0
2.1.1 Tariff	Tsh./month/household	1400	1500	1500	1600	1600	1600	1710	0
2.1.2 Number of Households	numbers	290208	313459	340336	371596	408173	451220	501697	0
2.1.3 Waste Collection Rate	%	33.2	39.4	45.6	51.8	58.1	64.4	70.8	0.0
2.1.4 RCC Collection Rate	%	80.0	80.0	80.0	80.0	80.0	80.0	80.0	0.0
2.2 RCC from Others	million Tsh.	1115	1361	1595	1932	2183	2494	2838	0
2.2.1 Tariff	Tsh./ton	36000	36000	36000	36000	36000	36000	36000	0
2.2.2 Amount of Waste Collected	ton/day	312	343	370	420	443	483	528	0
2.2.3 Waste Collection Rate	%	27.2	30.2	32.8	35.0	37.5	39.3	40.9	0.0
2.2.4 RCC Collection Rate	%	100.0	100.0	100.0	100.0	100.0	100.0	100.0	0.0
2.3 Scrap Value	million Tsh.	0	0	0	0	0	0	0	4653
3. Balance		-3753	-90	11	205	181	387	2968	4653

Table A-57 Calculation Table for Grant Aid Requirement (Area B), (Base Case = Tariff Tsh. 1100 and RCC Collection Rate 60%)

Year	Unit	1999	2000	2001	2002	2003	2004	2005	2006
1. Costs	million Tsh.	2045	1148	1580	2072	2424	2915	2352	0
1.1 Investment Cost	million Tsh.	1922	495	690	910	898	997	0	0
1.1.1 Skip Truck	million Tsh.	786	262	367	472	472	524	0	0
1.1.2 Container	million Tsh.	671	224	313	402	402	447	0	0
1.1.3 Push Cart	million Tsh.	23	9	10	36	24	26	0	0
1.1.4 Maintenance Shop	million Tsh.	442	0	0	0	0	0	0	0
1.2 Operation and Maintenance	million Tsh.	0	350	470	611	800	1001	1223	0
1.2.1 Labour (Primary)	million Tsh.	0	79	111	145	192	243	299	0
1.2.2 Repair (Primary)	million Tsh.	0	5	6	8	11	14	17	0
1.2.3 Labour (Secondary)	million Tsh.	0	11	14	19	26	32	40	0
1.2.4 Fuel (Secondary)	million Tsh.	0	69	92	125	167	209	255	0
1.2.5 Repair (Secondary)	million Tsh.	0	154	215	282	372	471	580	0
1.2.6 Maintenance Shop	million Tsh.	0	32	32	32	32	32	32	0
1.3 Disposal Fee	million Tsh.	107	218	304	399	527	667	822	0
1.4 Indirect Cost	million Tsh.	16	85	116	152	199	250	307	0
2. Revenues	million Tsh.	408	919	1228	1555	2037	2539	3122	2727
2.1 RCC from Households	million Tsh.	303	542	816	1121	1512	1952	2474	0
2.1.1 Tariff	Tsh./month/household	2000	2000	2000	2000	2000	2000	2020	0
2.1.2 Number of Households	numbers	277153	294312	314826	336878	360769	386270	414931	0
2.1.3 Waste Collection Rate	%	7.6	12.8	18.0	23.1	29.1	35.1	41.0	0.0
2.1.4 RCC Collection Rate	%	60.0	60.0	60.0	60.0	60.0	60.0	60.0	0.0
2.2 RCC from Others	million Tsh.	105	376	412	434	525	587	648	0
2.2.1 Tariff	Tsh./ton	24000	24000	24000	24000	24000	24000	24000	0
2.2.2 Amount of Waste Collected	ton/day	120	129	135	142	153	163	172	0
2.2.3 Waste Collection Rate	%	10.0	33.3	34.8	34.9	39.2	41.1	43.0	0.0
2.2.2 RCC Collection Rate	%	100.0	100.0	100.0	100.0	100.0	100.0	100.0	0.0
2.3 Subsidy from Disposal Fee	million Tsh.	0	0	0	0	0	0	0	0
2.4 Subsidy from Leasing Fee	million Tsh.	0	0	0	0	0	0	0	0
2.5 Scrap Value	million Tsh.	0	0	0	0	0	0	0	2727
3. Balance		-1636	-229	-352	-517	-387	-376	770	2727

Table A-58 Cash Flow for Grant-Aid Subsidized Case (Area A) FIRR = 13.20%

Project Year	Financial Year	Investment Cost ①	O & M Cost②	Cost ③=①+②	Benefit ④	Net Benefit ⑤=④-③	Cumulative Net Benefit
1	1999	4,208	1,956	6,163	2,410	-3,753	-3,753
2	2000	968	2,261	3,230	3,140	-90	-3,844
3	2001	1,042	2,776	3,818	3,829	11	-3,832
4	2002	1,340	3,344	4,683	4,888	205	-3,627
5	2003	1,577	4,068	5,645	5,825	181	-3,447
6	2004	1,676	4,894	6,570	6,958	387	-3,059
7	2005	0	5,702	5,702	8,670	2,968	-91
8	2006	0	0	0	4,653	4,653	4,561
Total		10,811	25,001	35,812	40,373	4,561	4,561

Table A-59 Cash Flow for Grant-Aid Subsidized Case (Area B) FIRR = 0.00%

Project Year	Financial Year	Investment Cost ①	O & M Cost②	Cost ③=①+②	Benefit ④	Net Benefit ⑤=④-③	Cumulative Net Benefit
1	1999	1,922	123	2,045	408	-1,636	-1,636
2	2000	495	653	1,148	919	-229	-1,865
3	2001	690	890	1,580	1,228	-352	-2,218
4	2002	910	1,162	2,072	1,555	-517	-2,734
5	2003	898	1,526	2,424	2,037	-387	-3,121
6	2004	997	1,918	2,915	2,539	-376	-3,497
7	2005	0	2,352	2,352	3,122	770	-2,727
8	2006	0	0	0	2,727	2,727	0
Total		5,911	8,624	14,535	14,535	0	0

Table A-60 Estimation of Standard Conversion Factor

(Unit: USD Million)

Item	1991	1992	1993	1994	1995	Average
1. Total Imports	1216.9	1476.7	1465.4	1504.9	1739.4	7403.3
2. Total Exports	335.3	495.5	439.9	519.4	682.9	2473
3. Customs Duty	134.7	165.1	94.4	119.5	163.5	9876.3
4. Total Export Tax	0	0	0	0	0	0
5. Total Export Subsidy	0	0	0	0	0	0
6. 1+2	1552.2	1972.2	1905.3	2024.3	2422.3	9876.3
7. 1+2+3-4+5	1686.9	2137.3	1999.7	2143.8	2585.8	10553.5
8. SCF = 6/7	0.9201	0.9228	0.9528	0.9443	0.9368	0.9358

Source: Economic Bulletin for the Quarter Ended 31st December, 1995, Vol. XXIV No. 4, The Bank of Tanzania, 1996

Note: SCF means Standard Conversion Factor

Figure A-13 Transition of Estimated Standard Conversion Factor

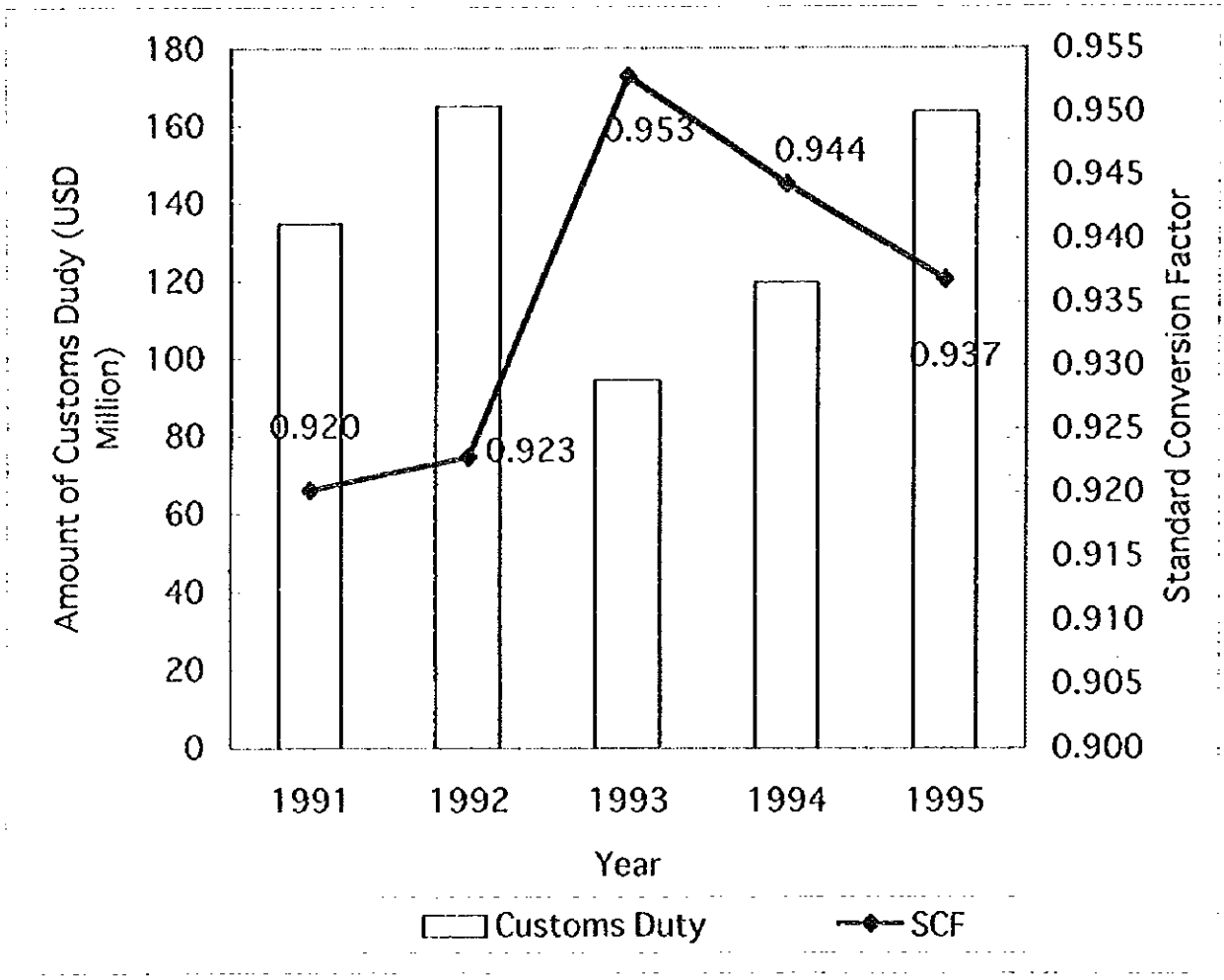


Table A-61 Estimation of Consumption Conversion Factor

(Unit: USD Million)

Item	1991	1992	1993	1994	1995	Average
1. Total Imports of Consumption Good	535.4	679.3	600.8	586.9	817.5	3220.0
2. Total Exports of Consumption Good	251.5	361.7	316.7	405.1	491.7	1826.7
3. Customs Duty	74.1	104.0	73.6	80.1	106.3	5046.7
4. Total Export Tax	0	0	0	0	0	0
5. Total Export Subsidy	0	0	0	0	0	0
6. 1+2	786.91	1041	917.54	992.04	1309.2	5046.7
7. 1+2+3-4+5	861	1145	991.17	1072.1	1415.5	5484.8
8. CCF = 6/7	0.9140	0.9092	0.9257	0.9253	0.9249	0.9201

Source: Economic Bulletin for the Quarter Ended 31st December, 1995, Vol. XXIV No. 4, The Bank of Tanzania, 1996

Note: CCF means Consumption Conversion Factor

Figure A-14 Transition of Estimated Consumption Conversion Factor

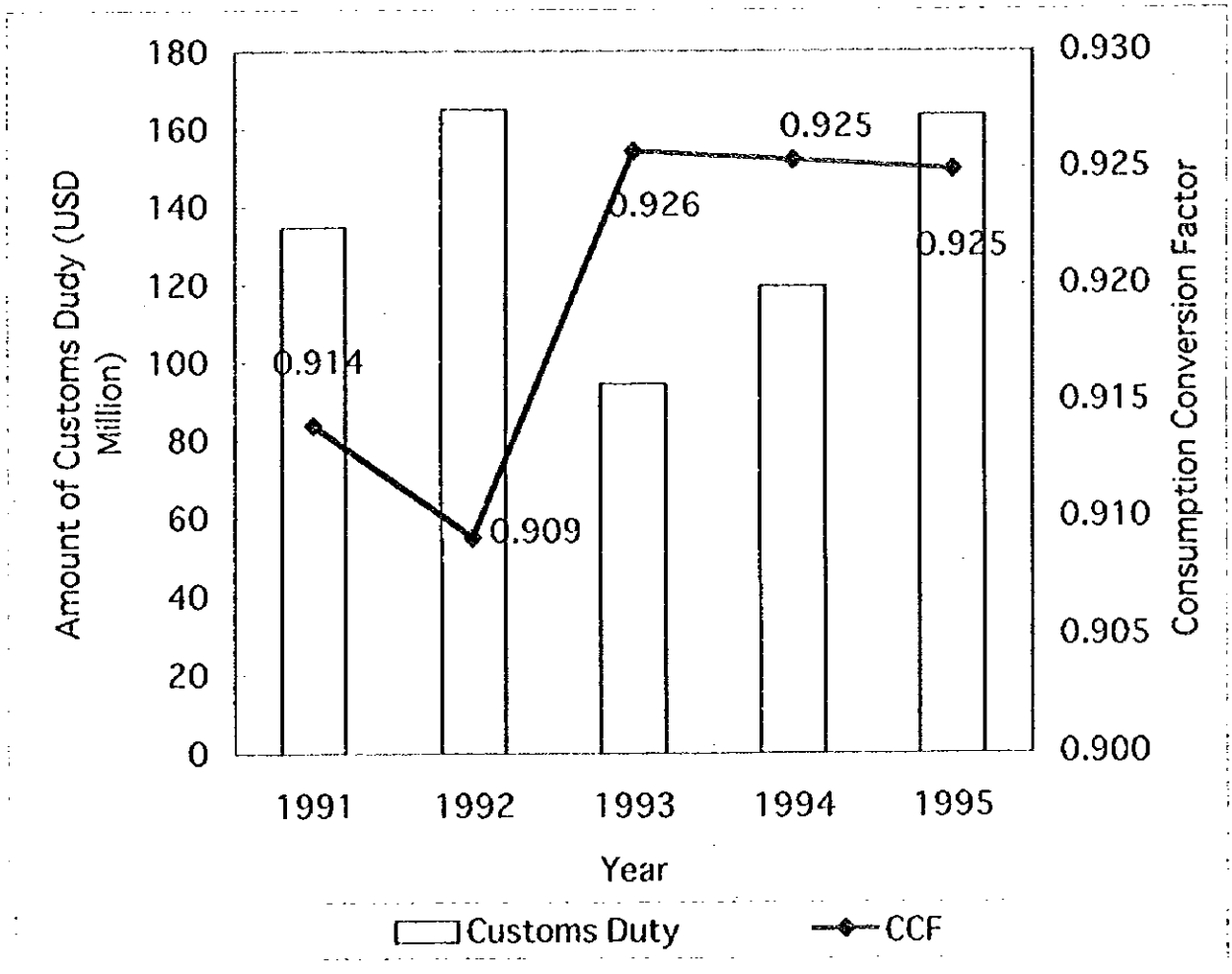


Table A-62 Conversion Factors for Investment and Operation & Maintenance Cost (Area A)

Cost Items	1 Share(%)	Traded Good & Services	Non-traded Good & Service	Skilled Labour	Unskilled Labour	Transferred Values	2 Conversion Factor for Each Cost Item	1 X 2
		1.000	0.936	0.920	0.611	0		
Investment Cost	100.0	n.r.	n.r.	n.r.	n.r.	n.r.	n.r.	0.873
(1) Buildozer for Disposal	6.3	75.0	5.0	5.0	5.0	10.0	100.0	
	n.r.	0.750	0.047	0.046	0.031	0.000	0.873	0.055
(2) Tipper for Disposal	4.7	75.0	5.0	5.0	5.0	10.0	100.0	
	n.r.	0.750	0.047	0.046	0.031	0.000	0.873	0.041
(3) Excavator for Disposal	0.9	75.0	5.0	5.0	5.0	10.0	100.0	
	n.r.	0.750	0.047	0.046	0.031	0.000	0.873	0.008
(4) Pick-up for Disposal	0.2	75.0	5.0	5.0	5.0	10.0	100.0	
	n.r.	0.750	0.047	0.046	0.031	0.000	0.873	0.002
(5) Tipper for Collection	85.5	75.0	5.0	5.0	5.0	10.0	100.0	
	n.r.	0.750	0.047	0.046	0.031	0.000	0.873	0.747
(6) Skip Truck for Collection	0.0	75.0	5.0	5.0	5.0	10.0	100.0	
	n.r.	0.750	0.047	0.046	0.031	0.000	0.873	0.000
(7) Compactor Truck for Collection	2.4	75.0	5.0	5.0	5.0	10.0	100.0	
	n.r.	0.750	0.047	0.046	0.031	0.000	0.873	0.021
(8) Container for Collection	0.0	75.0	5.0	5.0	5.0	10.0	100.0	
	n.r.	0.750	0.047	0.046	0.031	0.000	0.873	0.000
Operation & Maintenance Cost	100.0	n.r.	n.r.	n.r.	n.r.	n.r.	n.r.	0.675
(1) Labour	67.3	0.0	0.0	20.0	70.0	10.0	100.0	
	n.r.	0.000	0.000	0.184	0.428	0.000	0.612	0.412
(2) Fuel	5.5	80.0	5.0	0.0	5.0	10.0	100.0	
	n.r.	0.800	0.047	0.000	0.031	0.000	0.877	0.048
(3) Repair	15.3	80.0	5.0	0.0	5.0	10.0	100.0	
	n.r.	0.800	0.047	0.000	0.031	0.000	0.877	0.134
(4) Indirect Expenses	11.9	5.0	30.0	5.0	50.0	10.0	100.0	
	n.r.	0.050	0.281	0.046	0.306	0.000	0.682	0.081

Table A-63 Conversion Factors for Investment and Operation & Maintenance Cost (Area B)

Cost Items	1 Share(%)	Traded Good & Services	Non-traded Good & Service	Skilled Labour	Unskilled Labour	Transferred Values	2 Conversion Factor for Each Cost Item	1 X 2
		1.000	0.936	0.920	0.611	0		
Investment Cost	100.0	n.r.	n.r.	n.r.	n.r.	n.r.	n.r.	0.873
(1) Bulldozer for Disposal	6.3	75.0	5.0	5.0	5.0	10.0	100.0	
	n.r.	0.750	0.047	0.046	0.031	0.000	0.873	0.055
(2) Tipper for Disposal	4.7	75.0	5.0	5.0	5.0	10.0	100.0	
	n.r.	0.750	0.047	0.046	0.031	0.000	0.873	0.041
(3) Excavator for Disposal	0.9	75.0	5.0	5.0	5.0	10.0	100.0	
	n.r.	0.750	0.047	0.046	0.031	0.000	0.873	0.008
(4) Pick-up for Disposal	0.2	75.0	5.0	5.0	5.0	10.0	100.0	
	n.r.	0.750	0.047	0.046	0.031	0.000	0.873	0.002
(5) Tipper for Collection	0.0	75.0	5.0	5.0	5.0	10.0	100.0	
	n.r.	0.750	0.047	0.046	0.031	0.000	0.873	0.000
(6) Skip Truck for Collection	53.3	75.0	5.0	5.0	5.0	10.0	100.0	
	n.r.	0.750	0.047	0.046	0.031	0.000	0.873	0.465
(7) Compactor Truck for Collection	0.0	75.0	5.0	5.0	5.0	10.0	100.0	
	n.r.	0.750	0.047	0.046	0.031	0.000	0.873	0.000
(8) Container for Collection	34.6	75.0	5.0	5.0	5.0	10.0	100.0	
	n.r.	0.750	0.047	0.046	0.031	0.000	0.873	0.302
Operation & Maintenance Cost	100.0	n.r.	n.r.	n.r.	n.r.	n.r.	n.r.	0.690
(1) Labour	65.3	0.0	0.0	20.0	70.0	10.0	100.0	
	n.r.	0.000	0.000	0.184	0.428	0.000	0.612	0.399
(2) Fuel	7.5	80.0	5.0	0.0	5.0	10.0	100.0	
	n.r.	0.800	0.047	0.000	0.031	0.000	0.877	0.066
(3) Repair	20.3	80.0	5.0	0.0	5.0	10.0	100.0	
	n.r.	0.800	0.047	0.000	0.031	0.000	0.877	0.178
(4) Indirect Expenses	6.9	5.0	30.0	5.0	50.0	10.0	100.0	
	n.r.	0.050	0.281	0.046	0.306	0.000	0.682	0.047

Table A-64 EIRR (Case A-1) EIRR = 18.91%

Project Year	Financial Year	Investment	O & M	Cost	Benefit	Net Benefit	Cumulative Net Benefit
1	1999	3,673	1,538	5,212	2,217	-2,995	-2,995
2	2000	845	1,803	2,649	2,779	131	-2,864
3	2001	910	2,214	3,124	3,386	262	-2,602
4	2002	1,169	2,667	3,837	4,157	321	-2,282
5	2003	1,376	3,248	4,624	4,941	316	-1,965
6	2004	1,463	3,909	5,372	5,888	515	-1,450
7	2005	0	4,568	4,568	7,003	2,435	985
8	2006	0	0	0	4,280	4,280	5,265

Table A-65 EIRR (Case A-2) EIRR = 31.51%

Project Year	Financial Year	Investment	O & M	Cost	Benefit	Net Benefit	Cumulative Net Benefit
1	1999	3,673	1,320	4,994	2,217	-2,776	-2,776
2	2000	845	1,526	2,372	2,779	407	-2,369
3	2001	910	1,874	2,784	3,386	602	-1,766
4	2002	1,169	2,257	3,426	4,157	731	-1,036
5	2003	1,376	2,746	4,122	4,941	818	-218
6	2004	1,463	3,304	4,767	5,888	1,121	904
7	2005	0	3,849	3,849	7,003	3,154	4,057
8	2006	0	0	0	4,280	4,280	8,337

Table A-66 EIRR (Case B-1) EIRR = -8.38%

Project Year	Financial Year	Investment	O & M	Cost	Benefit	Net Benefit	Cumulative Net Benefit
1	1999	1,677	85	1,762	250	-1,512	-1,512
2	2000	432	451	883	621	-262	-1,774
3	2001	602	614	1,216	792	-425	-2,199
4	2002	794	801	1,596	966	-629	-2,828
5	2003	784	1,053	1,837	1,248	-589	-3,417
6	2004	870	1,324	2,194	1,528	-666	-4,083
7	2005	0	1,623	1,623	1,836	213	-3,870
8	2006	0	0	0	2,509	2,509	-1,361

Table A-67 EIRR (Case B-2) EIRR = -1.56%

Project Year	Financial Year	Investment	O & M	Cost	Benefit	Net Benefit ⑤=④-③	Cumulative Net Benefit
1	1999	1,677	46	1,724	250	-1,473	-1,473
2	2000	432	371	802	621	-182	-1,655
3	2001	602	503	1,105	792	-314	-1,969
4	2002	794	655	1,450	966	-483	-2,452
5	2003	784	860	1,644	1,248	-396	-2,848
6	2004	870	1,079	1,949	1,528	-422	-3,270
7	2005	0	1,321	1,321	1,836	514	-2,755
8	2006	0	0	0	2,509	2,509	-246

Table A-68 EIRR (Case B-3) EIRR = 41.26%

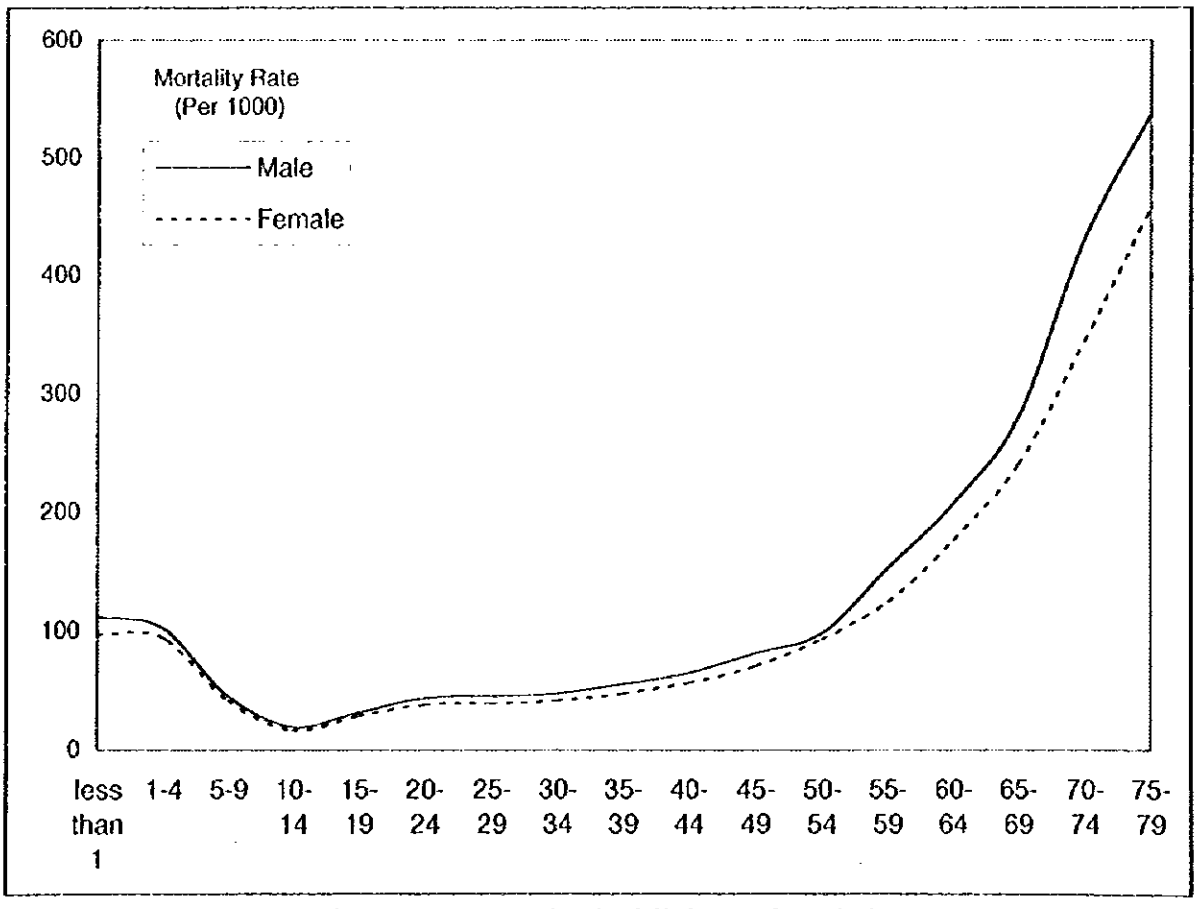
Project Year	Financial Year	Investment	O & M	Cost	Benefit	Net Benefit ⑤=④-③	Cumulative Net Benefit
1	1999	406	46	452	250	-202	-202
2	2000	8	371	378	621	242	40
3	2001	9	503	512	792	280	320
4	2002	794	655	1,450	966	-483	-163
5	2003	784	860	1,644	1,248	-396	-559
6	2004	870	1,079	1,949	1,528	-422	-981
7	2005	0	1,321	1,321	1,836	514	-466
8	2006	0	0	0	1,922	1,922	1,456

Table A-69 Mortality Rate In Dar es Salaam

(Unit: per 1,000 persons)

Age	Male Mortality Rate	Female Mortality Rate
less than 1	112.00	97.00
1-4	102.00	94.00
5-9	45.00	41.00
10-14	19.00	16.00
15-19	31.00	28.00
20-24	43.00	38.00
25-29	45.00	39.00
30-34	47.00	41.00
35-39	55.00	47.00
40-44	64.00	56.00
45-49	81.00	70.00
50-54	98.00	93.00
55-59	153.00	124.00
60-64	207.00	176.00
65-69	280.00	240.00
70-74	431.00	344.00
75-79	535.00	455.00

Figure A-15 Mortality Rate in Dar es Salaam



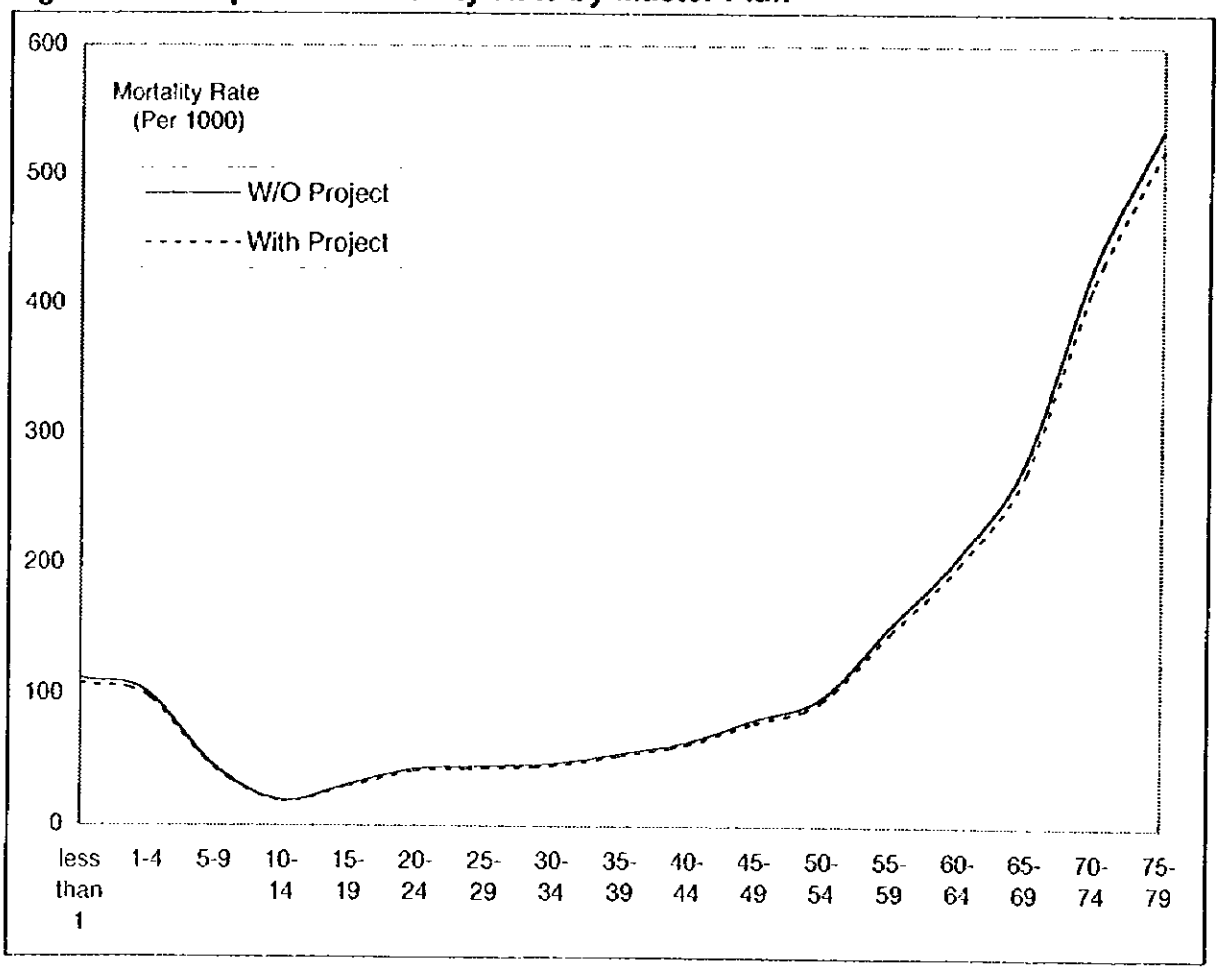
Sources: Wanawake Na Wanaume, Tanzania, the Ministry of Healeth, 1993

Table A-70 Impact on Mortality Rate by Master Plan

Unit: per 1,000 persons

Age	Male			Female		
	W/O Project	Impact	With Project	W/O Project	Impact	With Project
less than 1	112.00	3.39	108.61	97.00	2.93	94.07
1-4	102.00	3.08	98.92	94.00	2.84	91.16
5-9	45.00	1.36	43.64	41.00	1.24	39.76
10-14	19.00	0.57	18.43	16.00	0.48	15.52
15-19	31.00	0.94	30.06	28.00	0.85	27.15
20-24	43.00	1.30	41.70	38.00	1.15	36.85
25-29	45.00	1.36	43.64	39.00	1.18	37.82
30-34	47.00	1.42	45.58	41.00	1.24	39.76
35-39	55.00	1.66	53.34	47.00	1.42	45.58
40-44	64.00	1.93	62.07	56.00	1.69	54.31
45-49	81.00	2.45	78.55	70.00	2.12	67.88
50-54	98.00	2.96	95.04	93.00	2.81	90.19
55-59	153.00	4.62	148.38	124.00	3.75	120.25
60-64	207.00	6.26	200.74	176.00	5.32	170.68
65-69	280.00	8.46	271.54	240.00	7.25	232.75
70-74	431.00	13.03	417.97	344.00	10.40	333.60
75-79	535.00	16.17	518.83	455.00	13.75	441.25

Figure A-16 Impact on Mortality Rate by Master Plan



Annex 17

Evaluation of "Clean DSM" Pilot Project Events

17 Evaluation of "Clean DSM" Pilot Project Events

17.1 Culture Show Evaluation

Four culture shows were held at different venues around the city as specified in Table 17-1.

Table 17-1: Culture Show Performance Details

Date	Show	Venue	Number of People Attending
Feb 4	1	Kariakoo market	2000
Feb 14	2	Mnazi Mmoja ground	2000
Feb 22	3	Vingunguti A Primary School	2000
Feb 28	4	Uhuru Mchanganyiko Primary School Ground	1200
Total			7200

At each culture show, ten people from the audience were randomly selected and interviewed. The interview questions and results are presented below.

17.1.1 Interview Questions and Results

Q.1 How did you find today's Cultural Show prepared by the City Commission?

Venue	Kariakoo	Mnazi Mmoja	Vingunguti	Uhuru	Total	%
1. very good	8	10	6	7	31	78
2. good	1	0	4	3	8	20
3. average	1	0	0	0	1	2
4. poor	0	0	0	0	0	0
Total	10	10	10	10	40	

Q.2 Why do you say this?

Venue	Kariakoo	Mnazi Mmoja	Vingunguti	Uhuru	Total	%
1. it was entertaining	4	10	2	4	20	50
2. it was interesting	8	10	0	2	20	50
3. learning about waste		10	10	9	31	78
4. other reasons	0	0	0	0	0	0

Q.3 Which part of the Cultural Show did you like the most?

Venue	Kariakoo	Mnazi Mmoja	Vingunguti	Uhuru	Total	%
1. dancing	1	6	1	2	10	25
2. singing	6	6	1	1	14	35
3. drama	10	10	8	9	37	93

Note: Some interviewees indicated more than one option for this question.

Q.4 Have you learned anything at all from the Cultural Show?

Venue	Kariakoo	Mnazi Mmoja	Vingunguti	Uhuru	Total	%
1. bad effects of rubbish	5	10	3	3	21	53
2. ways of disposing of rubbish	6	10	5	4	25	63
3. there is a by-law concerning rubbish	5	10	0	6	21	53
4. every person has a responsibility to keep the city clean	8	10	6	2	26	65
5. I didn't learn anything	0	0	0	0	0	0
6. other reasons	1	0	0	3	4	10

Note: Other reasons are summarised below, with the number of people stating each reason being given in brackets.

1. to look after our health (1).
2. to care for the environment (1).
3. to obey the law (1).
4. to maintain individual and environmental cleanliness (1).

Q.5 What will you do about waste as a result of today's Cultural Show?

Venue	Kariakoo	Mnazi Mmoja	Vingunguti	Uhuru	Total	%
1. I will have a special place for disposing of waste	8	10	2	1	21	53
2. I will explain to others what I have learned	9	10	4	3	26	65
3. I will pay the refuse collection charge	6	1	0	0	7	18
4. I will get a rubbish bin.	6	10	5	4	25	63
5. I will clean all the waste in my neighbourhood	4	10	1	3	18	45
6. I will dig a pit for disposing of waste	8	7	3	5	23	58
7. I will not do anything	0	0	0	0	0	0
8. Something else	0	0	0	0	0	0

17.1.2 Other Comments

At the Vingunguti A performance, 3 of the 10 people interviewed stated that they thought JICA had done a good job in trying to improve the Vingunguti dump, especially in paving the road. However, they requested that drains be installed along the road leading into the landfill.

17.2 Cinema Show Evaluation

Ten cinema shows were held at different venues around the city as specified in Table 17-2. The film "Pendezesha Jiji lako" was shown for the first time at the fourth show.

Table 17-2: Cinema Show Performance Details

Date	Show	Venue	Number of People Attending	Interviews Conducted (Y/N)
Feb 7	1	Vingunguti A Primary School	6000	N
Feb 13	2	Buguruni Police Station Ground	2000	Y
Feb 15	3	Vingunguti B Primary School	1500	N
Feb 18	4	Mission Quarter, Kariakoo	1500	Y
Feb 20	5	Kidongo Chekundu	150	N
Feb 21	6	Buguruni Moto Primary School	1200	Y
Feb 25	7	Tandale Primary School	5000	Y
Feb 26	8	Tandika market	2700	Y
Feb 27	9	Ilala Garden	2500	Y
Mar 1	10	Ilala Boma Primary School	2000	Y
TOTAL			24550	

At seven of the cinema shows, ten people from the audience were randomly selected and interviewed. The interview questions and results are summarised below.

17.2.1 Interview Questions and Results

Q.1 How did you find today's Cinema show prepared by the City Commission?

Venue	2	4	6	7	8	9	10	Total	%
1. very good	10	3	2	10	3	4	4	36	52
2. good	0	5	8	0	6	4	6	29	41
3. average	0	1	0	0	1	2	0	4	6
4. poor	0	1	0	0	0	0	0	1	1
Total	10	10	10	10	10	10	10	70	100

Q.2 Why do you say this?

Venue	2	4	6	7	8	9	10	Total	%
1. it was entertaining	10	1	10	10	1	6	7	45	64
2. it was interesting	9	1	0	10	1	4	3	28	40
3. learning about rubbish	1	8	0	10	9	8	7	43	61
4. other reasons	0	2	0	0	0	0	0	2	3

Note: Other reasons are summarised below. The numbers in brackets indicates the number of people giving this reason.

1. It is motivating (1).
2. The person who rated the cinema show as poor explained that this was because the DCC says a lot but does not implement nor enforce what they say (1).

Q.3 Have you learned anything at all from the Cinema show?

Venue	2	4	6	7	8	9	10	Total	%
1. bad effects of rubbish	10	3	8	10	2	9	0	42	60
2. ways of disposing of waste	9	6	4	10	3	6	3	41	59
3. there is a by-law concerning waste	1	3	2	9	1	7	0	23	33
4. every person has a responsibility to keep the city clean	5	2	5	8	4	1	7	32	46
5. I didn't learn anything	0	0	1	0	0	0	1	2	3
6. something else	0	0	0	0	0	0	0	0	0

Q.4 What will you do about waste as a result of the Cinema show?

Venue	2	4	6	7	8	9	10	Total	%
1. I will have a special place for disposing of waste	10	4	5	10	4	6	0	39	56
2. I will explain to others what I have learned	5	4	2	6	3	1	3	24	34
3. I will pay the refuse collection charge	4	1	2	8	0	3	0	18	26
4. I will get a rubbish bin	9	4	7	8	1	6	4	39	56
5. I will clean all the rubbish in my neighbourhood	5	2	4	7	2	5	1	26	37
6. I will did a pit for rubbish disposal	10	2	9	6	1	8	3	39	56
7. I will not do anything	0	0	0	0	0	0	2	2	3
8. something else	0	2	4	0	0	6	0	12	17

Note: Other reasons are summarised below. The numbers in brackets indicates the number of people giving this reason.

1. I will boil drinking water (5).
2. I will not dispose of waste illegally (2).
3. I will obey the DCC by-laws which have been implemented (1).
4. I will prevent children from playing in areas where there is waste (1).
5. I will use the waste containers provided (1).
6. I will avoid buying food from street kiosks (1).
7. I will take steps with people who dump waste illegally (1).
8. I will make sure that the City Commission enforces the law it has passed (1).

17.2.2 Other Comments

1. Several people commented that many people do not keep local rules concerning cleanliness.

2. Many people commented on the failure of DCC to implement and enforce the by-laws stating that the by-laws are there for a purpose. If they are not kept, stern measures should be taken against whoever breaks them. Otherwise the illegal dumping of rubbish will never cease. It was suggested that street chairmen could be involved in this process.

3. Another suggestion was that the number of collection vehicles should be increased in order to increase the amount of waste collected for disposal. This should go hand in

hand with a greater commitment and seriousness from all residents throughout the city concerning waste and cleanliness.

4. One person in the Kariakoo area stated that more drums should be put in the streets. People are ready to make a contribution to buy these drums only if DCC regularly collects waste.
5. Several people commented that education and awareness raising on SWM should not end with the current campaign. It should continue until peoples' behaviour has changed.
6. The content of the film show should cover all points concerning cleanliness such as cleaning toilets, boiling drinking water, etc.
7. DCC/JICA should plan other means of educating people with the problems caused by waste if it is disposed in inappropriate places. Large posters (billboards) showing problems which waste can cause and how people can be prosecuted if they throw waste randomly could be displayed at road intersections, schools, football grounds, etc.

17.3 Contents of Primary School Syllabus on SWM

This section is included here as some comparison was made with the book and content of the trial lesson.

SWM issues come under hygiene, health and sanitation which are taught as part of the Domestic Science Primary School syllabus. Std 1-2 and Std 3-7 are taught this subject for 2 and 4 periods per week respectively. The main contents of this syllabus relating to SWM have been summarised below:

Std 1: Students are taught about cleanliness of the classroom, school grounds and toilets. They are taught how to collect waste properly and are shown approved places for disposing it within the school grounds. In some city schools, students should be taken around the school buildings to collect paper and other rubbish and put it in a rubbish bin. Students should become accustomed to dispose of rubbish including fruit peel, food remains and sweet wrappings in approved places within the school grounds (container, drum, pit).

Std 2: Students are taught about cleanliness of the places where we stay. It is demonstrated to students how to collect waste properly and they are shown approved places for disposing of it in their school grounds. They are taught about collecting classroom waste and disposing of it properly. They also learn about sweeping and cleaning around the home and disposing of this waste properly.

Std 3: Students are taught about daily cleanliness of all the places where they live and stay (home, school, etc.). This includes collection and disposal of waste in suitable places by burning or burial. They learn about diseases such as cholera, malaria, eye diseases, etc. including their symptoms, means of infection and prevention.

Std 4: Students are taught about flies, mosquitoes, rats and bacteria. Students learn that flies breed in toilets, illegal dump sites and kitchens; mosquitoes like to breed in water including in puddles, tins and pots. They also learn about bacteria and importance of burying rubbish, tins, etc.

Std 5: Students learn about the importance of a clean house and means of cleaning each day. Places for disposing of waste are discussed in more detail. In villages, people should dig a refuse pit or build a place for burning rubbish. Rubbish which does not rot should be buried separately. In cities, people should clean their rubbish bins regularly.

Std 6: Students learn about preventing and eliminating flies and mosquitoes. They are shown pictures of the life cycles of flies and mosquitoes. They carry out an inspection of school grounds looking at rubbish pits and covering all places having dirty water where mosquitoes and flies can breed.

Std 7: No specific reference to SWM matters was found.

17.4 Book Evaluation Summary

17.4.1 Teachers Evaluation

An evaluation questionnaire was distributed to 30 primary school teachers along with several copies of the draft version of the book for them and their students. The results of this questionnaire are presented below:

Number of evaluation forms distributed to teachers: 30

Number of completed evaluation forms received: 18

1. What did you think of the book OVERALL?

Option	Number of Respondents	%
a. very good	6	33
b. good	10	56
c. average	2	11
d. poor	0	0

2. What did you like BEST about the book?

Option	Number of Respondents	%
a. words	10	56
b. pictures	7	39
c. games	2	11
d. stories	1	6
e. all parts	1	6
f. other	0	0

Note: on one form, more than one option was ticked for this question

3. What did you like LEAST about the book?

Option	Number of Respondents	%
a. words	3	17
b. pictures	7	39
c. games	2	11
d. stories	1	6
e. other	0	0
f. not applicable	5	28

Note: One teacher commented that a long time is required to explain to the students the meaning of the pictures (1).

4. Did you give the book to your Std 4-5 students to read and use?

YES 12
NO 6

If YES answer parts 4.1, 4.2 and 4.3 below:

4.1 What did they think of the book?

Option	Number of Respondents	%
a. very good	4	33
b. good	6	50
c. average	2	17
d. poor	0	0

4.2 What did they like BEST about the book?

Option	Number of Respondents	%
a. words	2	17
b. pictures	8	67
c. games	4	33
d. stories	3	25
e. all parts	0	0
f. other	0	0

Note: On some forms, more than one option was ticked for this question

4.3 What did they like LEAST about the book?

Option	Number of Respondents	%
a. words	3	25
b. pictures	1	8
c. games	1	8
d. stories	2	17
e. other	2	17
f. not applicable	3	25

Note: Other reasons are summarised below. The numbers in brackets indicates the number of people giving this reason.

1. In some places, the explanations are very short without many examples to help students understand the ideas presented (1).
2. It took a long time for the students to understand the large picture of good and bad things about waste (1).

5. In this question, circle YES or NO for each option. We want to compare the CONTENT of the book with the Ministry of Education syllabus and existing teaching material on hygiene, sanitation and waste management for primary school students.

Questions	YES	NO	No answer
a. does the book cover the syllabus content?	13 (72%)	2	3
b. does the book extend the syllabus content?	9 (50%)	6	3
c. is the book useful for teaching?	16 (89%)	0	2
d. is the book suitable for Std 4-5 students' use?	14 (78%)	2	2

6. Which parts of the book are not suitable? (you may indicate more than one answer)

Option	Number of Respondents	%
a. some of the ideas are too difficult for Std 4-5 students	7	39
b. the words are too difficult for Std 4-5 students	4	22
c. the pictures are difficult to understand	4	22
d. the games are not explained clearly	4	22
e. the stories about Yohana and Neema are poor	3	17
f. there are too many words	2	11
g. the words are too small	3	17
h. the pictures are poor	2	11
i. the book is very different from most Tanzanian primary school books	11	61
j. other	0	0

7. Please state any suggestions you have for changes to the book:

8. Any other Comments:

(The responses to Q.7 and Q.8 have been categorised into groups as shown below):

Main Points	No. of Respondents
1. parts of book (ideas, words, pictures) too difficult for Std 4/5	6
2. more explanation/simplification is needed	6
3. topics are not well arranged/don't flow	5
4. extension of teaching to wider society needed	4
5. topics are short and explained briefly	3

Other Points	No. of Respondents
1. include a table of contents	1
2. list and define vocabulary	1
3. chapter for each topic	1
4. pictures should be big and numbered	1
5. suitable for Std 1-4 students only	1
6. book has so many explanations that students get broad understanding	1
7. include guidelines for teachers	1
8. the stories may be long and exciting	1
9. include more exercises	1
10. more suitable for Std 6	1
11. use of word duniani not appropriate in some places	1
12. crossword clues should be clear and correct	1
13. crossword makes children think this is a swahili lesson (not health lesson)	1
14. the crutches in the cartoon (Neema's injury) is not realistic	1
15. teachers in these subjects should get a seminar every 3 months	1
16. front cover should show a boy and girl primary school student	1

17.4.2 Student Evaluation

Two schools were visited so that the book could be evaluated directly with Std 5 pupils. These schools were Kumbukumbu and Mwananyamala B primary schools. 6-7 copies of the book were given to Std 5 pupils at each school for trial and evaluation. One week later, the school were revisited and the book was discussed with pupils. At both schools, the pupils had looked through the book in groups. It should be noted that:

1. Kumbukumbu school was fourth last year in Std 7 leaving examinations in DSM. The students interviewed seemed very intelligent and were well prepared, having

completed most of the exercises and games in the book. Conversely, the pupils at Mwananyamala B did not seem to be as intelligent as those at Kumbukumbu. However, one reason for this may be that they were not very well prepared for the evaluation as many of the students had not looked at all the book prior to the evaluation.

2. The book was discussed with a total of 35 and 30 Std 5 pupils at Kumbukumbu and Mwananyamala B primary schools respectively.

17.4.2.1Kumbukumbu Primary School

At Kumbukumbu, the following questions were asked and answers taken from some members of the class.

1. What did they think of the book?

All students said it was good or very good with most students favouring the good answer. Reasons given for their assessment were that the book talks about the importance of a) SWM; b) environmental protection; c) preventing diseases; d) making cleanliness; e) not throwing rubbish away.

2. What did they like BEST about the book?

Most students liked the words or pictures. One student liked the questions and said that the explanations are suitable for Std 5 pupils.

3. What did they like LEAST about the book?

Most students said there was nothing in particular which they didn't like.

4. General Comments

- some of the questions are simple; others are difficult.
- the pictures are very good. However, the compost making picture and average bag of waste picture are difficult to understand as is the detective picture.
- several pupils stated that there are too few questions and more are needed.
- one pupil commented that we should ask some Std 4 students for their opinions in order to see if the book is suitable for Std 4 students.

5. Students' Questions

- will this book be provided to Std 5 primary school pupils only?
- will this book have the same questions or will the questions be split so that there will be two sets of questions for Std 4 (easier questions) and Std 5 (more difficult questions)?

17.4.2.2Mwananyamala B

At Mwananyamala B, the following questions were asked and answers taken from some members of the class. However, the class did not seem well prepared. Hence, the strategy was changed and answers to the questions were obtained by circulating around the students asking questions and checking what they did and did not understand.

1. What did they think of the book?

All students said it was very good.

2. What did they like BEST about the book?

Most students liked the words.

3. What did they like least about the book?

Most students said there was nothing in particular which they didn't like.

4. General Comments

- The detective picture is least understood. An example of how to use it should be included with the explanation.
- These students did not seem to be familiar with join the dots, mixed up words and crossword games. When these games were explained to them, they understood quickly. The main problem here seemed to be lack of preparation rather than the games being new or too difficult.

17.5 Trial Lesson Evaluations

17.5.1 "Mama Safi" lesson (Std. 2)

17.5.1.1Method

1. For questions 1-3, students were instructed to raise their hands to answer "YES" or "NO". 5-7 students were then selected to give reasons for their answers.
2. For question 4, students raised their hands to answer the question. 5-7 students were selected and their answers recorded.

17.5.1.2Results

Primary School	Ilala Boma	Vingun-guti B	Kawe A	Mpa-kani	Muun-gano	Azi-mio	Total	%
Number of pupils	90	82	87	70	65	99	493	
Q.1 Do you understand that waste is dangerous?	63	72	87	63	62	97	444	90
Q.2 Do you know what happens to us if our surroundings are dirty?	72	78	70	56	55	97	428	87
Q.3 Do you know why we put waste into the rubbish bin or pit?	72	80	74	56	59	98	439	89

Note: 1. Q.2 Reasons:
a) it causes disease; b) it allows harmful insects to breed;
c) our eyes will become painful because of the dirty place;
d) we will become sick; e) we will suffer from stomach ache.
2. Q.3 Reasons:
a) to avoid the occurrence of disease;
b) to store waste; c) destruction of harmful breeding insects;
d) to keep our surroundings clean; e) to avoid bad smell;
f) we are afraid to get sick.

Q.4 What are you going to do by yourself about waste and cleanliness?

1. to wash clothes;
2. to sweep;
3. to mop the floor;
4. to wash my body;
5. to wash dishes;
6. to wash hands;
7. to dig refuse pit.

17.5.2 Dialogue lesson (Std. 5)

17.5.2.1Method

1. For questions 1-3, students were instructed to raise their hands to answer "YES" or "NO". 5-7 students were then selected to give reasons for their answers.
2. For question 4, students wrote down their answers and handed them in.

17.5.2.2Results

Primary School	Ilala Boma	Ving-unguti B	Kawe A	Mpa-kani	Muun-gano	Azi-mio	Total	%
Number of pupils	62	52	75	52	63	90	394	
Q.1 Do you understand that waste is dangerous?	50	51	60	49	60	88	358	91
Q.2 Do you know what happens to us if our surroundings are dirty?	43	47	64	51	62	88	355	90
Q.3 Do you know how waste is dangerous to us?	59	47	60	52	63	86	367	93

Note: Q.2 and Q.3 Reasons (same for both questions):
a) eruption of diseases such as malaria, diarrhoea and cholera;
b) production of cockroaches, mosquitoes, rats, flies and other harmful insects and bacteria;
c) people are very likely to get injured.

Q.4 What action can you take about waste and cleanliness?

1. to clean generally 55%
2. use rubbish bin 19%
3. use rubbish pit 16%
4. wash clothes, dishes 6%
5. mopping 3%
6. burning waste 1%

17.5.3 Group Work Lessons: Std 2 and 5

17.5.3.1Method

1. For question 1, students were instructed to raise their hands according to which option a,b,c or d they chose.
2. For Q 2-3, each group of Std 2 pupils (they had been working in groups for most of the lesson) wrote down their answers to these questions and handed them in.
3. For Q 2-3, Std 5 pupils individually wrote their answers down and handed them in.

4. In both cases, these answers were collated and put into different categories as shown in the table.

17.5.3.2Results

1. How did you find this lesson?

Class	Std 2			Std 5				
School	Kawe A	Mpa-kani	Azimio	Ilala Boma	Vingun-guti B	Muun-gano	Total	%
number of pupils	94	68	96	68	62	63	451	
a. very good	69	58	80	68	61	63	399	88
b. good	3	10	16	0	1	0	30	7
c. average	5	0	0	0	0	0	5	1
d. poor	17	0	0	0	0	0	17	4

Note: In the first Std 2 lesson at Kawe A, the snakes and ladders game was used. However, the class was much bigger than expected and there was not enough copies of the game to go around. It also took too long to teach everyone how to play. This is the main reason for 17 pupils stating that the lesson was poor. Following this lesson, the snakes and ladders game was simplified and used Std 5 only.

2. What did you learn about waste and cleanliness?

Class	Std 2			Std 5 (total students = 192)				
School	Kawe A	Mpa-kani	Azi-mio	Ilala Boma	Vingun-guti B	Muun-gano	Total	%
a. to clean and beautify the city including our surroundings	6	7	12	15	10	22	47	24
b. good ways of waste storage and disposal (pit, bucket, container, burning)	8	0	11	33	34	35	102	53
c. bad effects of rubbish; diseases caused by waste; bad behaviour concerning waste	3	11	4	19	4	7	30	16
d. benefits and usefulness of rubbish	0	0	0	3	1	1	5	3
e. illegible answer or no answer	N/A	N/A	N/A	6	15	8	29	15

3. What are you going to do about waste and the problems it causes?

Class	Std 2			Std 5 (total students = 192)				
School	Kawe A	Mpa-kani	Azi-mio	Ilala Boma	Vingun-guti B	Muun-gano	Total	%
a. to put waste in a bucket, pit, drum or other good place or burn waste	14	10	16	45	33	53	131	68
b. to make the city clean and beautify the environment	12	1	3	4	8	5	17	9
c. to avoid the bad effects of rubbish and bad behaviour	0	3	3	17	18	3	38	20
d. illegible answer or no answer	N/A	N/A	N/A	8	9	9	26	13

17.6 Primary School Teachers' Seminar

17.6.1 Evaluation Questionnaire Summary

Q.1 What did you think of the seminar? (choose one answer)

Option	Number of Participants	%
a. very good	31	84
b. good	6	16
c. average	0	0
d. poor	0	0

Q.2 Which part of the seminar did you like the most? (choose one answer)

Option	Number of Participants	%
a. evaluation of the book	5	14
b. Study team's presentation	19	51
c. Participants' presentation	13	35

Q.3 What did you learn from the seminar? (multiple answer)

Option	Number of Participants	%
a. increased knowledge	23	62
b. problems caused by waste	13	35
c. different ways of teaching	27	73
d. nothing	0	0
e. other	0	0

Q.4 Will you use anything from the seminar in your teaching? (multiple answer)

Option	Number of Participants	%
a. things learned about waste	15	40
b. book	20	54
c. pictures	6	16
d. puppet	2	5
e. dialogue	5	14
f. games	6	16
g. photos	4	11
h. nothing	0	0
i. other	2	5

Note: Other reasons are summarised below, with the number of people stating each reason being given in brackets.

1. The seminar helped and gave us light on how to take care of waste in general (1).
2. The seminar will help us to make follow-up in our schools (1).

17.6.2 Other Comments

A large number of general comments were made by the participants:

- 20 participants (54%) suggested that more seminars should be introduced to teachers and the general public.
- 8 participants (22%) stated that by conducting seminars more often it can motivate people to improve their habits concerning cleanliness.
- 7 participants (19%) suggested that the seminar should be conducted monthly and that the allocated time should be increased from half a day.
- 7 participants (19%) stated that we should take their comments on the book given during the seminar into account when producing the final version of the book.
- 4 participants (11%) suggested that teaching materials such as drawing paper and pens be provided to participants to enable them to prepare teaching aids.
- 4 participants (11%) suggested that this topic be introduced into the primary school syllabus.

- 3 participants (8%) suggested the JICA Study team to visit and teach at all primary schools in DSM.
- 2 participants (5%) suggested that the JICA Study team introduce this project to all primary schools in DSM.
- 2 participants (5%) advised producing more copies of the book.