

## Supplementary Materials

**Table S1.** Scenario A - Costs of major repairs distribution.

Without Rehabilitation								
Year	<50,000 MWK	50,000–100,000 MWK	100,000–150,000 MWK	150,000–200,000 MWK	200,000–300,000 MWK	300,000–400,000 MWK	>400,000 MWK	Total
1	31	1	0	1	1	0	2	36
2	38	9	5	2	0	0	1	55
3	23	10	2	0	2	0	1	38
4	32	13	3	0	0	0	0	48
5	41	21	3	1	0	0	0	66
6	23	11	4	0	0	0	0	38
7	23	13	3	0	2	0	0	41
8	15	12	2	2	1	0	0	32
9	26	21	3	3	0	0	2	55
10	23	15	1	3	2	0	0	44
11	33	15	2	2	1	2	0	55
12	19	10	3	4	2	2	1	41
13	9	12	4	2	2	2	1	32
14	18	30	6	1	1	0	1	57
15	18	23	5	2	0	1	0	49
Total	372	216	46	23	14	7	9	687
With Rehabilitation								
Year	<50,000 MWK	50,000–100,000 MWK	100,000–150,000 MWK	150,000–200,000 MWK	200,000–300,000 MWK	300,000–400,000 MWK	>400,000 MWK	Total
1	9	5	5	3	4	8	7	41
2	11	12	2	4	3	5	14	51
3	6	7	2	4	1	2	5	27
4	6	3	1	1	0	5	14	30
5	2	4	0	0	2	1	16	25
6	6	6	0	0	0	0	6	18
7	0	0	0	0	0	0	2	2
8	1	0	1	0	0	0	0	2
9	2	1	0	0	0	0	0	3
10	3	0	0	0	0	0	1	4
11	0	2	0	0	0	0	0	2
12	0	1	0	0	0	0	1	2
13	0	0	1	0	1	0	0	2
14	0	1	0	1	0	0	1	3
15	0	0	0	0	0	0	0	0
Total	46	42	12	13	11	21	67	212

**Table S2.** Scenario B - Costs of major repairs distribution.

Without Rehabilitation								
Year	<50,000 MWK	50,000–100,000 MWK	100,000–150,000 MWK	150,000–200,000 MWK	200,000–300,000 MWK	300,000–400,000 MWK	>400,000 MWK	Total
1	14	0	0	0	0	0	0	14
2	41	1	1	0	0	0	2	45
3	27	5	0	0	0	0	1	33
4	21	3	1	0	1	0	2	28
5	16	4	1	0	1	0	1	23
6	27	11	3	1	0	0	0	42
7	12	8	2	1	0	0	0	23
8	10	8	1	0	1	1	0	21
9	19	12	0	1	0	0	0	32
10	6	8	1	1	1	0	0	17
11	5	10	2	1	0	1	1	20
12	17	11	2	2	0	0	0	32
13	18	9	5	4	0	0	0	36
14	18	7	1	0	0	0	0	26
15	23	9	2	1	1	0	0	36
Total	274	106	22	12	5	2	7	428
With Rehabilitation								
Year	<50,000 MWK	50,000–100,000 MWK	100,000–150,000 MWK	150,000–200,000 MWK	200,000–300,000 MWK	300,000–400,000 MWK	>400,000 MWK	Total
1	6	3	3	1	2	2	6	23
2	10	10	12	5	4	2	5	48
3	5	6	7	2	2	2	4	28
4	2	0	5	2	3	1	1	14
5	1	4	2	1	3	0	0	11
6	5	2	0	0	0	0	1	8
7	5	1	0	0	0	1	0	7
8	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0
11	1	0	0	1	0	0	0	2
12	1	0	0	1	0	0	1	3
13	0	0	0	0	0	0	0	0
14	0	0	0	0	0	0	0	0
15	0	1	0	0	0	0	0	1
Total	36	27	29	13	14	8	18	145

**Table S3.** Scenario C - Costs of major repairs distribution.

Without Rehabilitation								
Year	<50,000 MWK	50,000–100,000 MWK	100,000–150,000 MWK	150,000–200,000 MWK	200,000–300,000 MWK	300,000–400,000 MWK	>400,000 MWK	Total
1	2	1	0	0	0	0	0	3
2	12	1	0	0	0	0	1	14
3	9	1	0	0	0	0	0	10
4	10	5	1	0	0	0	0	16
5	7	9	4	0	0	0	1	21
6	11	8	1	0	0	1	0	21
7	4	1	2	0	0	0	0	7
8	4	6	0	0	0	0	0	10
9	7	6	1	0	0	0	0	14
10	7	8	1	0	0	0	0	16
11	11	6	0	0	0	0	0	17
12	10	9	1	1	0	0	1	22
13	7	12	4	1	0	0	0	24
14	7	9	2	0	0	0	0	18
15	7	5	2	0	0	0	0	14
Total	115	87	19	2	0	1	3	227
With Rehabilitation								
Year	<50,000 MWK	50,000–100,000 MWK	100,000–150,000 MWK	150,000–200,000 MWK	200,000–300,000 MWK	300,000–400,000 MWK	>400,000 MWK	Total
1	4	2	0	0	0	4	2	12
2	4	5	3	0	0	0	3	15
3	1	4	1	1	1	0	12	20
4	0	2	1	0	1	1	0	5
5	1	1	1	0	0	0	0	3
6	1	1	0	0	0	0	0	2
7	1	0	0	0	0	0	0	1
8	1	0	0	0	0	0	0	1
9	0	0	0	1	0	0	3	4
10	0	0	0	0	0	1	0	1
11	0	0	0	0	0	0	0	0
12	0	0	0	0	0	0	1	1
13	0	0	0	0	0	0	0	0
14	0	0	0	0	0	1	0	1
15	0	0	0	0	0	0	0	0
Total	13	15	6	2	2	7	21	66

**Table S4.** Scenario D - Costs of major repairs distribution.

Without Rehabilitation								
Year	<50,000 MWK	50,000–100,000 MWK	100,000–150,000 MWK	150,000–200,000 MWK	200,000–300,000 MWK	300,000–400,000 MWK	>400,000 MWK	Total
1	3	0	0	0	0	0	0	3
2	5	4	0	0	0	0	1	10
3	1	0	1	0	1	0	0	3
4	3	3	3	1	0	0	0	10
5	1	3	2	0	0	0	0	6
6	3	3	2	1	0	0	0	9
7	6	6	1	0	0	0	1	14
8	4	4	1	1	1	0	0	11
9	10	4	2	2	1	0	0	19
10	1	3	4	0	0	0	0	8
11	5	8	0	0	0	0	0	13
12	7	14	2	1	1	1	1	27
13	5	6	2	0	0	0	0	13
14	4	5	4	0	0	0	0	13
15	5	8	1	1	0	1	1	17
Total	63	71	25	7	4	2	4	176
With Rehabilitation								
Year	<50,000 MWK	50,000–100,000 MWK	100,000–150,000 MWK	150,000–200,000 MWK	200,000–300,000 MWK	300,000–400,000 MWK	>400,000 MWK	Total
1	1	1	4	0	1	0	3	10
2	2	3	4	2	0	1	4	16
3	1	0	0	0	0	3	1	5
4	1	3	0	0	0	0	1	5
5	2	1	1	0	2	0	1	7
6	1	3	1	0	0	0	0	5
7	1	1	0	0	0	0	0	2
8	1	1	0	0	0	0	0	2
9	1	0	0	0	0	0	0	1
10	0	1	0	0	0	0	0	1
11	0	0	0	0	0	1	0	1
12	0	1	0	0	0	1	0	2
13	0	0	0	0	0	0	0	0
14	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0
Total	11	15	10	2	3	6	10	57

**Table S5.** Distribution of component replacement for assets with no rehabilitation.

	Scenario A	Scenario B	Scenario C	Scenario D	Total
Fast Wearing	1499	1207	578	341	3625
Longer Life	1127	640	398	308	2473
Total	2626	1847	976	649	6098
Fast Wearing					
Bobbin	234	167	87	55	543
Bush Bearings	328	243	141	73	785
Centralisers	333	245	129	54	761
Cup Seal	180	167	58	50	455
O-Ring	176	156	56	43	431
U-Seal	248	229	107	66	650
Longer Life					
Cylinder	85	52	18	25	180
Foot Valve	143	85	67	35	330
Fulcrum Pin	106	37	29	26	198
Handle	89	41	40	20	190
Handle Pin	71	29	29	16	145
Hanger Pin	84	39	27	15	165
Pedestal	18	13	5	2	38
Plunger	92	54	35	20	201
Pump Head	41	31	11	14	97
Pump Head Cover	25	19	4	11	59
Rising Main (PVC)	59	25	19	22	125
Rods	232	123	90	77	522
Rope	47	16	11	17	91
Sockets	35	76	13	8	132

**Table S6.** Distribution of component replacement for assets with rehabilitation.

	Scenario A	Scenario B	Scenario C	Scenario D	Total
Fast Wearing	564	427	223	126	1340
Longer Life	1059	472	393	204	2128
Total	1623	899	616	330	3468
Fast Wearing					
Bobbin	99	63	37	22	221
Bush Bearings	119	68	47	26	260
Centralisers	101	73	40	20	234
Cup Seal	93	73	41	14	221
O-Ring	91	61	37	19	208
U-Seal	61	89	21	25	196
Longer Life					
Cylinder	84	69	37	13	203
Foot Valve	89	74	40	17	220
Fulcrum Pin	74	35	31	14	154
Handle	83	20	29	13	145
Handle Pin	73	19	28	11	131
Hanger Pin	75	22	27	12	136
Pedestal	63	13	21	9	106
Plunger	80	29	29	16	154
Pump Head	80	17	24	16	137
Pump Head Cover	72	11	22	14	119
Rising Main (PVC)	74	7	24	12	117
Rods	124	96	47	35	302
Rope	66	17	25	12	120
Sockets	22	43	9	10	84

**Table S7.** Scenario A rod replacements.

Without Rehabilitation															
No. of rods	Year														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1-2	2	2	4	5	18	6	1	4	5	6	9	4	4	12	9
3-4	1	4	4	5	3	2	4	4	4	1	3	1	4	7	4
5-6	1	2	0	2	3	2	3	2	1	0	3	4	3	5	3
7-8	0	1	1	2	3	2	0	0	2	2	1	1	0	0	0
9-10	1	0	0	0	3	2	1	0	1	1	1	2	5	2	1
>10	1	0	2	2	1	0	1	1	0	0	0	3	2	0	0
Total, n	6	9	11	16	31	14	10	11	13	10	17	15	18	26	17
Total, %	1.74	2.62	3.20	4.65	9.01	4.07	2.91	3.20	3.78	2.91	4.94	4.36	5.23	7.56	4.94

  

With Rehabilitation															
No. of rods	Year														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1-2	3	6	3	1	0	2	0	0	0	0	0	0	0	0	0
3-4	1	4	5	0	1	2	1	0	0	0	0	0	0	1	0
5-6	5	5	2	4	5	0	1	0	0	0	0	0	1	0	0
7-8	4	5	5	5	7	1	0	0	0	1	0	1	0	1	0
9-10	2	5	2	3	3	3	1	0	0	0	0	0	0	0	0
>10	0	3	3	5	2	2	0	1	1	0	0	1	0	0	0
Total, n	15	28	20	18	18	10	3	1	1	1	0	2	1	2	0
Total, %	4.36	8.14	5.81	5.23	5.23	2.91	0.87	0.29	0.29	0.29	0.00	0.58	0.29	0.58	0.00

Table S8. Scenario B rod replacements.

Without Rehabilitation															
No. of rods	Year														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1-2	0	2	1	2	2	4	4	2	4	4	3	3	9	2	4
3-4	0	0	1	1	0	2	1	2	1	2	1	4	5	3	5
5-6	0	2	1	2	2	1	2	1	2	2	0	0	2	3	1
7-8	0	0	1	1	1	2	0	1	1	0	2	3	3	1	0
9-10	0	0	0	1	0	1	1	1	1	0	0	2	1	0	0
>10	0	0	0	0	0	0	0	2	0	0	0	0	1	0	0
Total, n	0	4	4	7	5	10	8	9	9	8	6	12	21	9	10
Total, %	0.00	1.83	1.83	3.21	2.29	4.59	3.67	4.13	4.13	3.67	2.75	5.50	9.63	4.13	4.59

  

With Rehabilitation															
No. of rods	Year														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1-2	2	0	3	1	0	1	0	0	0	0	0	0	0	0	0
3-4	2	10	3	2	1	1	1	0	0	0	0	0	0	0	0
5-6	2	8	4	4	4	0	0	0	0	0	0	0	0	0	0
7-8	1	8	7	4	1	1	0	0	0	0	0	0	0	0	0
9-10	3	10	2	1	1	1	0	0	0	0	0	2	0	0	0
>10	2	1	0	1	1	0	0	0	0	0	0	0	0	0	0
Total, n	12	37	19	13	8	4	1	0	0	0	0	2	0	0	0
Total, %	5.50	16.97	8.72	5.96	3.67	1.83	0.46	0.00	0.00	0.00	0.00	0.92	0.00	0.00	0.00



Table S9. Scenario C rod replacements.

Without Rehabilitation															
No. of rods	Year														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1-2	1	2	0	2	6	4	2	0	2	3	4	6	6	3	5
3-4	0	0	0	0	2	1	1	2	2	2	0	2	5	2	0
5-6	0	0	1	0	0	1	0	1	0	1	0	2	1	1	1
7-8	0	0	0	0	0	1	0	2	0	0	0	1	3	0	0
9-10	0	0	0	1	0	0	0	0	0	1	0	1	0	1	0
>10	0	0	0	0	0	1	0	0	0	0	0	1	2	0	0
Total, n	1	2	1	3	8	8	3	5	4	7	4	13	17	7	6
Total, %	0.74	1.48	0.74	2.22	5.93	5.93	2.22	3.70	2.96	5.19	2.96	9.63	12.59	5.19	4.44
With Rehabilitation															
No. of rods	Year														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1-2	3	2	1	0	0	0	0	1	0	0	0	0	0	0	0
3-4	0	1	1	0	0	0	1	0	0	0	0	0	0	0	0
5-6	0	4	4	0	1	0	0	0	1	0	0	0	0	0	0
7-8	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0
9-10	2	2	8	0	0	0	0	0	2	1	0	1	0	0	0
>10	1	1	3	0	0	1	0	0	0	0	0	0	0	1	0
Total, n	7	11	18	0	1	1	1	1	3	1	0	1	0	1	0
Total, %	5.19	8.15	13.33	0.00	0.74	0.74	0.74	0.74	2.22	0.74	0.00	0.74	0.00	0.74	0.00

**Table S10.** Scenario D rod replacements.

Without Rehabilitation															
No. of rods	Year														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1-2	1	2	0	2	1	1	1	4	4	1	2	10	2	2	3
3-4	0	3	0	0	0	1	1	0	1	1	2	1	4	1	2
5-6	0	0	1	1	0	1	1	1	1	1	0	2	0	0	1
7-8	0	1	1	1	1	0	0	1	1	0	0	0	0	1	0
9-10	0	0	0	1	0	0	0	0	2	1	0	0	0	1	2
>10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total, n	1	6	2	5	2	3	3	6	9	4	4	13	6	5	8
Total, %	0.89	5.36	1.79	4.46	1.79	2.68	2.68	5.36	8.04	3.57	3.57	11.61	5.36	4.46	7.14

  

With Rehabilitation															
No. of rods	Year														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1-2	0	2	0	1	1	2	1	0	1	1	0	0	0	0	0
3-4	0	3	0	0	0	1	0	1	0	0	0	0	0	0	0
5-6	0	0	1	0	1	0	0	0	0	0	1	0	0	0	0
7-8	0	2	0	0	0	1	0	1	0	0	0	1	0	0	0
9-10	1	3	1	2	0	0	0	0	0	0	0	0	0	0	0
>10	0	2	0	1	1	1	0	0	0	0	0	1	0	0	0
Total, n	1	12	2	4	3	5	1	2	1	1	1	2	0	0	0
Total, %	0.89	10.71	1.79	3.57	2.68	4.46	0.89	1.79	0.89	0.89	0.89	1.79	0.00	0.00	0.00