Osiligi Charity Projects

Repair of broken hand pumps

in Kenya

FF 647

2023 Interim Report for the Eagle Foundation

August 2023

Contents

1. Executive Summary

This report outlines the progress made from January – June 2023 by the Osiligi Charity Kenyan team in restoring hand-pumps in the rural district regions of Kenya. During this time, the team has restored 121 hand-pumps across 9 counties of Kenya as a result of Eagle Foundation funding, providing access to water to around 41,000 people. Despite the rising cost of materials and transport, the average cost of a repair was around 70p per person, similar with previous years.

The Osiligi charity is on track to achieve its target of repairing 200-250 hand-pumps using EF funding by the end of 2023.

2. Introduction

The aim of the project is to continue to repair and restore non-functional hand-pumps that provide access to ground water to the rural communities of Kenya. The Osiligi charity has restored over 2000 hand-pumps since 2015. However there are still many more to be repaired – probably in excess of 3000 – and each year many pumps break down. The cost of repairing a broken pump is about 20 times lower than that the cost of digging a new well, so it is a very cost-effective activity.

By the end of 2022, the Eagle Foundation (EF) had supported the Osiligi charity for 4 years, resulting in the repair of 799 pumps, benefiting around 236,000 people. The aim for 2023 was to repair a further 200-250 pumps with EF funding. This report outlines the progress achieved from January 1st until 30th June 2023.

The Osiligi UK management team and the team of 7 Kenyan water engineers who oversee the pump repairs all work as volunteers. The charity does not pay the engineers a salary; however, the charity does contribute a small amount towards their education or the education of their children.

Repairing hand pumps consists of the following steps:

- Locate broken pumps
- Ask the community to appoint a caretaker
- Repair the pump with the help of the caretaker
- Train the caretaker on basic repairs
- Train the community how to generate a water economy from the pump (to pay for future repairs)
- Record keeping and follow up.

Rather than just repairing the broken pumps, it is paramount in each project that the charity gives the local community the resources (spares, knowledge and engineer

contact details) so that they can perform their own basic repairs and maintenance in order to keep their pumps working for many years to come.

3. Identification and locations of broken pumps

To locate the broken pumps, our team of Kenyan engineers work closely with local authorities, MPs, and word of mouth from the communities. Once identified, getting to site can be quite a challenge, often having to resort to getting out of the car and walking to the last stage (see the first photograph in Appendix 3).

During the first half of 2023, the EF-funded pump repairs took place in 9 counties of south and south-west Kenya (Figure 1). Each engineer is responsible for covering one or more regions. Figure 2 shows the number of EF-funded pump repairs undertaken in each county during the first half of 2023. In total, **121 pumps** were restored during this period as a result of EF funding.

Figure 1: The red arrows denote the 9 (of 47) Kenyan counties where pumps repairs took place during 1H2023.

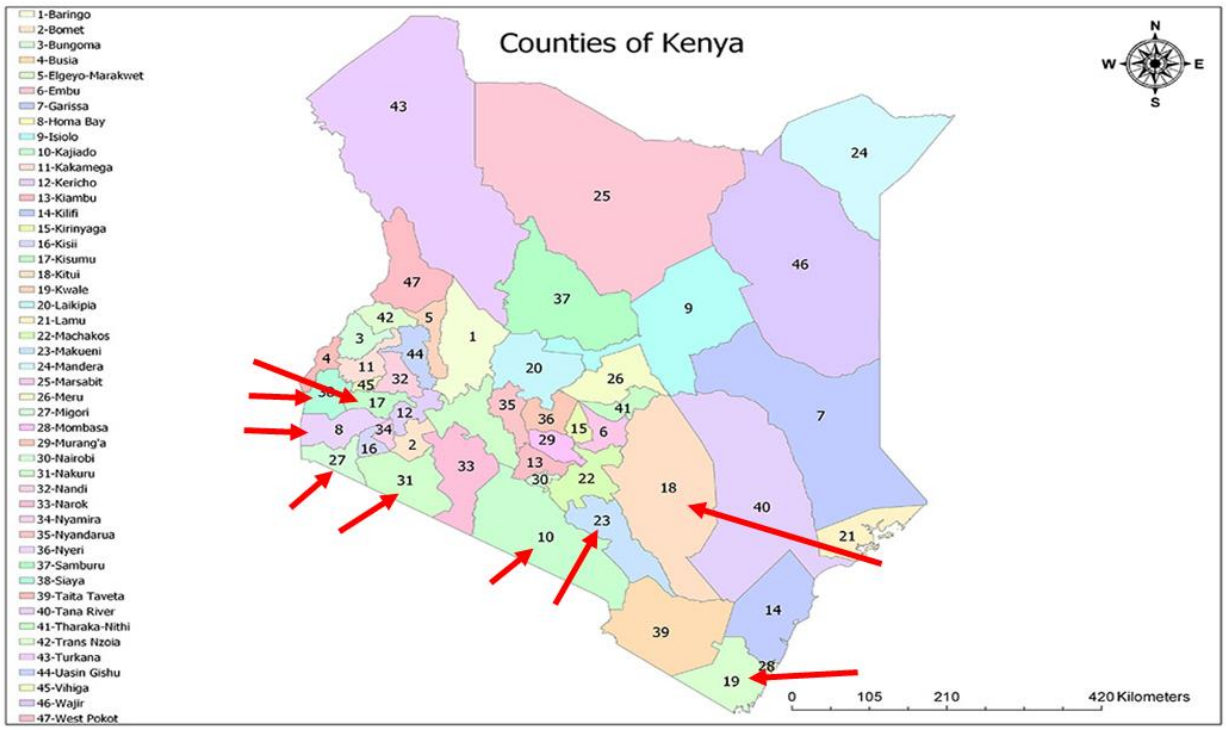
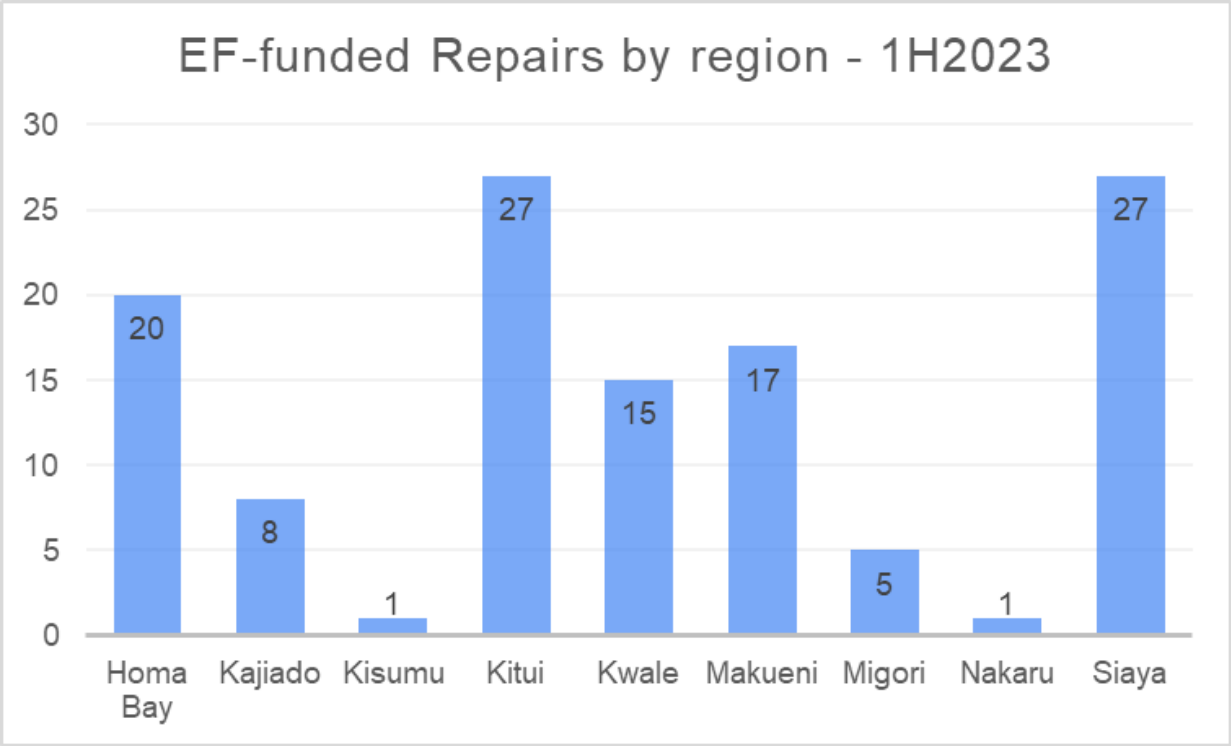


Figure 2: EF-funded repairs during 1H2023 by location



4. Pump repairs

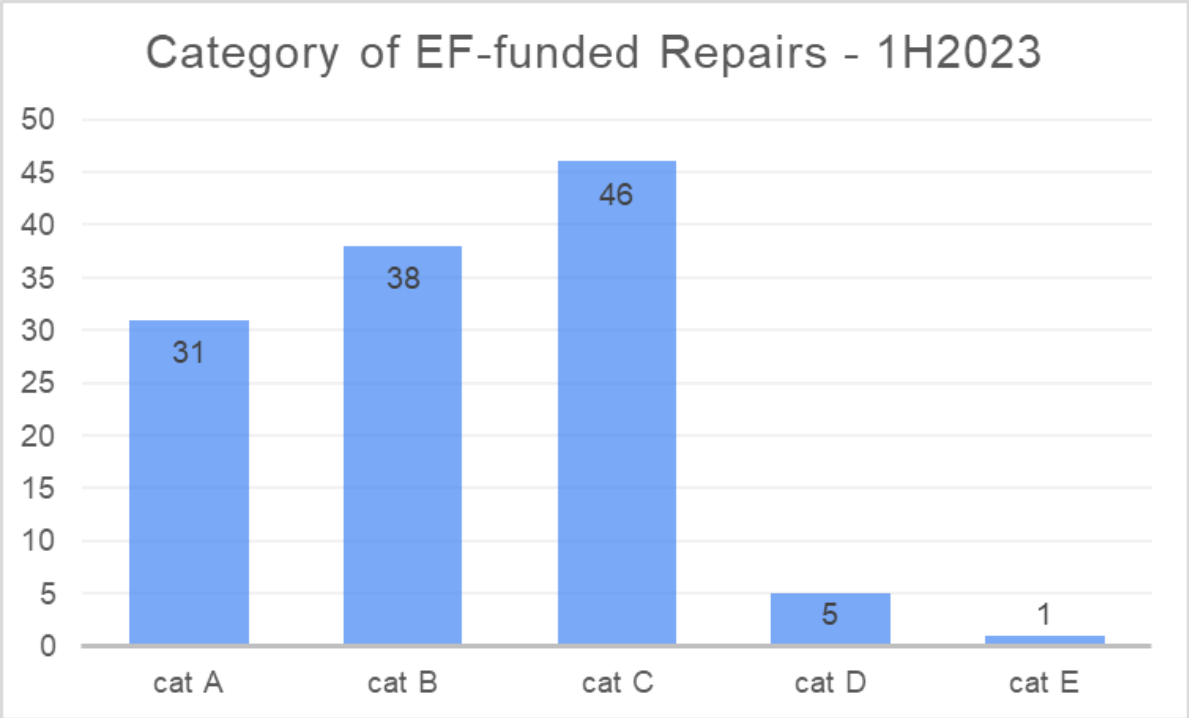
While we can repair any type of hand-pump, we concentrate on Afridev hand pumps as, once repaired, the caretaker can make simple repairs without the need of a winch. He/she is also trained in basic periodic maintenance and operation management due to the conditions imposed by the environment and how a community uses their pump. Appendix 2 shows the EF-funded hand-pump repairs in January 2023, and as can be seen in column M, these were all Afridev pumps.

There are 5 categories of repair; A to E. Category A is a basic repair where the parts cost less than 5,000Ksh (£27). B will require a more extensive repair where more parts are needed up to a cost of 25,000Ksh (£136). A repairs and B repairs can be carried out by the community if they are available to receive training. Category C is a more extensive repair where risers and rods may have to be replaced, and these costs can be up to 50,000Ksh (£272). D is where the installation of a new pump is required should the old one be beyond economic repair. E are where additional resources are needed for the repair, such as having to employ a contractor to fish out broken pipes, flush a

borehole, broken or damaged plinths, or any civil works. These costs do not include the transport of materials and people to site, any accommodation and meals.

Figure 3 shows that the vast majority of EF-funded repairs during 1H2023 fell into categories A-C.

Figure 3: Shows EF-funded repairs by category of repair.



As noted above, a total of 121 pumps were repaired in the first half of 2023 as a result of EF funding. These repairs have resulted in the provision of clean water to 41,329 people. Therefore, the average number of beneficiaries per pump repair was 342.

Given that this was achieved from just under £30,000 of EF funding (£30,000 minus some carry forward; see Appendix 1), the cost per beneficiary was approximately 70p. This is similar to the previous 4 years of EF-funding.

Bearing in mind that 121 pumps were repaired during 1H2023, we are well on track to achieve our goal of 200-150 pumps repaired in 2023 from EF funding.

5. Data collection and verification

Data is collected on every pump repaired, and this includes the following information: the date of repair, category of pump repair, the type of repair, type of pump, population served, the number of homes, the county, the village and pump name, exact location (latitude and longitude), whether the borehole is registered and community certificated, photographs, what is the alternative source (cost and distance), the depth and water column, and training. Importantly two caretakers are identified for each pump repair, and their names and phone numbers are also recorded, which allows the pump repair to be verified and followed up (see below).

All this information is submitted by each Osiligi engineer on each of their repairs and is automatically collated onto a spreadsheet. Appendix 3 shows the data collected from a typical month (January 2023).

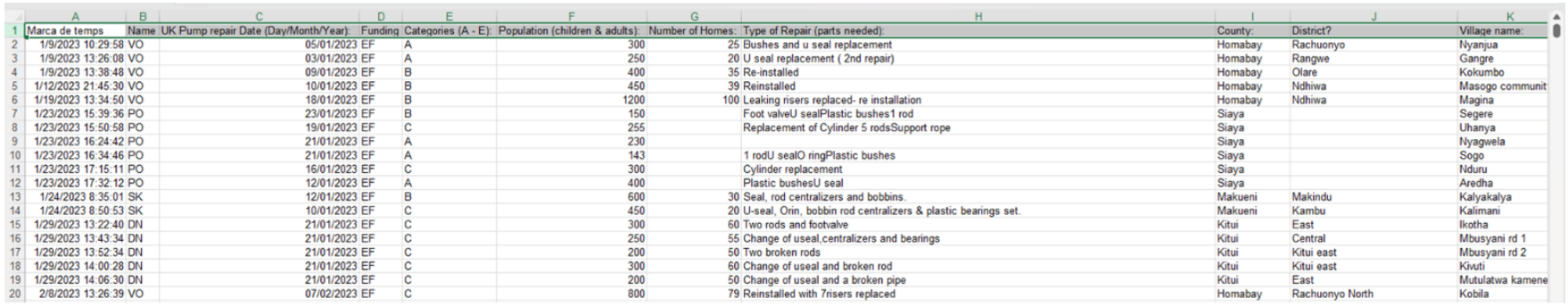
At the end of every month, one member of our team has the responsibility to call a caretaker for each pump repaired in the preceding month. This is to verify that the pump is still working. In addition, it is the responsibility of each Kenyan engineer to post photos, with GPS coordinates, onto the Osiligi WhatsApp group. These is also verified by the above team member.

It has not been possible for Eric McKinnon (UK-based), who manages the entire Kenyan repair team, to visit Kenya to audit the pump repairs since 2019, due to COVID restrictions. However, in March 2023, Eric was able to spend 2.5 months in Kenya auditing a representative set of pump repairs undertaken by the Osiligi charity in 2022. Forty (40) of the 176 (23%) pumps repaired using Eagle Foundation funding in 2022 were visited and investigated: **All** were all found to be in good working order.

Appendix 1: EF-funded pump repairs (1H2023)

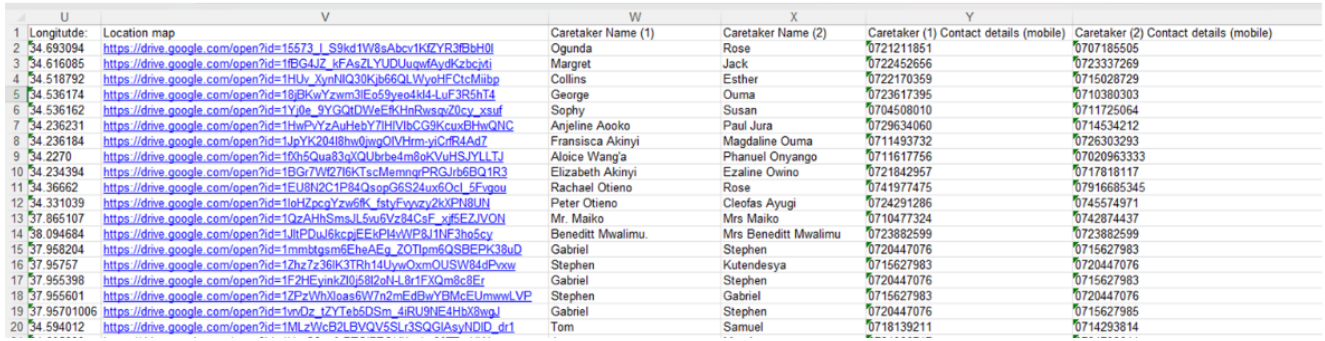
Date	Donations (KES)	Money Used (KES)	By month			Cumulative for 2023		
			Pumps	No. of Users	Cost per user (KES)	Pumps	Users helped	Average cost per user
January 2023								
Eagle Foundation (£5,000 GBP)	743,405							
Brought forward (from 2022)	- 28,743							
Pump repairs		697,000	18	6378	110	18	6378	110
Education budget		-						
Bank charges		3,000						
Sub-total	714,662	700,000						
C/F		14,662						
February 2023								
Eagle Foundation (£5,000 GBP)	736,858							
Brought forward	14,662							
Pump repairs		597,000	25	9325	75	43	15703	89
Education budget		100,000						
Bank charges		3,000						
Sub-total	751,520	700,000						
C/F		51,520						
March 2023								
Eagle Foundation (£5,000 GBP)	733,647							
Brought forward	51,520							
Pump repairs		611,611	19	6550	105	62	22253	94
Education budget		70,000						
Bank charges		3,000						
Sub-total	785,167	684,611						
C/F		100,556						
April 2023								
Eagle Foundation (£5,000 GBP)	734,770							
Brought forward	100,556							
Pump repairs		695,155	21	6446	119	83	28699	99
Education budget		70,000						
Bank charges		3,000						
Sub-total	835,326	768,155						
C/F		67,171						
May 2023								
Eagle Foundation (£5,000 GBP)	735,893							
Brought forward	67,171							
Pump repairs		615,800	12	3378	196	95	32077	110
Education budget		45,000						
Bank charges		-						
Sub-total	803,064	660,800						
C/F		142,264						
June 2023								
Eagle Foundation (£5,000 GBP)	816,910							
Brought forward	142,264							
Pump repairs		670,000	26	9252	81	121	41329	103
Education budget		80,000						
Bank charges		-						
Sub-total	959,174	750,000						
C/F		209,174						
Grand total (Jan-June 2023)	4,472,740	4,263,566	121	41329	103	121	41329	103
C/F		209,174						

Appendix 2: Pump repair record keeping (January 2023 as a representative month)



Marca de temps	Name	UK Pump repair Date (Day/Month/Year):	Funding	Categories (A - E):	Population (children & adults):	Number of Homes:	Type of Repair (parts needed):	County:	District?	Village name:
1/9/2023 10:29:58	VO	05/01/2023	EF	A	300	25	Bushes and u seal replacement	Homabay	Rachuonyo	Nyanjua
1/9/2023 13:26:08	VO	03/01/2023	EF	A	250	20	U seal replacement (2nd repair)	Homabay	Rangwe	Gangre
1/9/2023 13:38:48	VO	09/01/2023	EF	B	400	35	Re-installed	Homabay	Olare	Kokumbo
1/12/2023 21:45:30	VO	10/01/2023	EF	B	450	39	Reinstalled	Homabay	Ndhiwa	Masogo communit
1/19/2023 13:34:50	VO	18/01/2023	EF	B	1200	100	Leaking risers replaced- re installation	Homabay	Ndhiwa	Magina
1/23/2023 15:39:36	PO	23/01/2023	EF	B	150		Foot valveU sealPlastic bushes1 rod	Siaya		Segere
1/23/2023 15:50:58	PO	19/01/2023	EF	C	255		Replacement of Cylinder 5 rodsSupport rope	Siaya		Uhanya
1/23/2023 16:24:42	PO	21/01/2023	EF	A	230			Siaya		Nyagwela
1/23/2023 16:34:46	PO	21/01/2023	EF	A	143		1 rodU sealO ringPlastic bushes	Siaya		Sogo
1/23/2023 17:15:11	PO	16/01/2023	EF	C	300		Cylinder replacement	Siaya		Nduru
1/23/2023 17:32:12	PO	12/01/2023	EF	A	400		Plastic bushesU seal	Siaya		Aredha
1/24/2023 8:35:01	SK	12/01/2023	EF	B	600	30	Seal, rod centralizers and bobbins.	Makueni	Makindu	Kalyakalya
1/24/2023 8:50:53	SK	10/01/2023	EF	C	450	20	U-seal, Orin, bobbin rod centralizers & plastic bearings set.	Makueni	Kambu	Kalimani
1/29/2023 13:22:40	DN	21/01/2023	EF	C	300	60	Two rods and footvalve	Kitui	East	Ikotha
1/29/2023 13:43:34	DN	21/01/2023	EF	C	250	55	Change of useal,centralizers and bearings	Kitui	Central	Mbusyani rd 1
1/29/2023 13:52:34	DN	21/01/2023	EF	C	200	50	Two broken rods	Kitui	Kitui east	Mbusyani rd 2
1/29/2023 14:00:28	DN	21/01/2023	EF	C	300	60	Change of useal and broken rod	Kitui	Kitui east	Kivuti
1/29/2023 14:06:30	DN	21/01/2023	EF	C	200	50	Change of useal and a broken pipe	Kitui	East	Mutulatwa kamene
2/8/2023 13:26:39	VO	07/02/2023	EF	C	800	79	Reinstalled with 7risers replaced	Homabay	Rachuonyo North	Kobila

Village name:	Pump Name:	Pump Type:	Borehole Registration Details:	Depth of Well/Borehole (m):	Water Column Depth (m):	Alternative source	Distance of water (kms)?	Cost of water (Ksh)?	Latitude	Longitutde:	Location map
Nyanjua	Kadan water pump	Afridev	Registered	80	18	Alternative Pump	1	2.5	0.493474	34.693094	https://drive.google.com/open?id=15573_I
Gangre	Gangre c water pump(2nd repair)	Afridev	Yes	25	16	River	1	00	0.636782	34.616085	https://drive.google.com/open?id=1fBG4JZ
Kokumbo	Kanyolo Nyoguda water point	Afridev	Yes	67ft	30 ft	Lake	3	20	0.497938	34.518792	https://drive.google.com/open?id=1HUv_Xy
Masogo community	Masogo community water pump	Afridev	N/A	80m	66m	Alternative Pump	0.5	5	0.644749	34.536174	https://drive.google.com/open?id=18jBKwY
Magina	Magina C water pump (second repair)	Afridev	N/A	35m	24m	River	1	00	0.644741	34.536162	https://drive.google.com/open?id=1Yj0e_9
Segere	Ka Anjeline	Afridev	Yes	15m	8m	Spring			0.10738	34.236231	https://drive.google.com/open?id=1HwPvY
Uhanya	Ahago	Afridev	Yes	30m	5m	River			0.107368	34.236184	https://drive.google.com/open?id=1JpYK2(
Nyagwela	Nyagwela Primary school	Afridev	Yes	50m	30m	Spring			0.15130	34.2270	https://drive.google.com/open?id=1fXh5Qu
Sogo	Sogo	Afridev	Yes	25m	5m	Spring			0.12706	34.234394	https://drive.google.com/open?id=1BGr7W
Nduru	Ka Herenia	Afridev	Yes	30m	3m	Spring			0.001214	34.36662	https://drive.google.com/open?id=1EU8N2
Aredha	Aredha	Afridev	Yes	20m	3m	River			0.00829	34.331039	https://drive.google.com/open?id=1loHZpc
Kalyakalya	Munathi	Afridev	None	13	10	Alternative Pump	3	5	2.420121	37.865107	https://drive.google.com/open?id=1QzAHh
Kalimani	Kwa Mwalimu	Afridev	None	15	10	Alternative Pump	5	10	2.560685	38.094684	https://drive.google.com/open?id=1JltPDu
Ikotha	Kwa kilonzi	Afridev	Well	15	5	Alternative Pump	1	5	1.390851	37.958204	https://drive.google.com/open?id=1mmbtg
Mbusyani rd 1	Mbusyani community pump	Afridev	Well	10	2	Alternative Pump	1	5	1.388543	37.95757	https://drive.google.com/open?id=1Zhz7z3
Mbusyani rd 2	Kwa kilonzi	Afridev	Well	9	2	Alternative Pump	1	5	1.404119	37.955398	https://drive.google.com/open?id=1F2HEyi
Kivuti	Kivuti pump	Afridev	Well	12	3	Alternative Pump	1	5	1.403314	37.955601	https://drive.google.com/open?id=1ZPzWh
Mutulatwa kamene	Kamene pump	Afridev	Well	13	4	Alternative Pump	2	5	1.40916135	37.95701006	https://drive.google.com/open?id=1vnDz_t
Kobila	Kowuor secondary school water pump	Afridev	Yes	60m	50	River	2	00	0.446359	34.594012	https://drive.google.com/open?id=1MLzWc



Longitutde:	Location map	Caretaker Name (1)	Caretaker Name (2)	Caretaker (1) Contact details (mobile)	Caretaker (2) Contact details (mobile)
34.693094	https://drive.google.com/open?id=15573_I_S9kd1W8sAbcv1KfZYR3fBbH0I	Ogunda	Rose	0721211851	0707185505
34.616085	https://drive.google.com/open?id=1fBG4JZ_kFAsZLYUDUuqwfAydKzbcjxti	Margret	Jack	0722452656	0723337269
34.518792	https://drive.google.com/open?id=1HUv_XynNlQ30Kjb66QLWyoHFCtcMiibp	Collins	Esther	0722170359	0715028729
34.536174	https://drive.google.com/open?id=18jBKwYzwm3lEo59yeo4kl4-LuF3R5hT4	George	Ouma	0723617395	0710380303
34.536162	https://drive.google.com/open?id=1Yj0e_9YGQtDWeEfKHnRwsqvZ0cy_xsuf	Sophy	Susan	0704508010	0711725064
34.236231	https://drive.google.com/open?id=1HwPvYzAuHebY7lHlVlbCG9KcuxBHwQNC	Anjeline Aooko	Paul Jura	0729634060	0714534212
34.236184	https://drive.google.com/open?id=1JpYK204l8hw0jwgOlVHrm-yiCrfR4Ad7	Fransisca Akinyi	Magdaline Ouma	0711493732	0726303293
34.2270	https://drive.google.com/open?id=1fXh5Qua83qXQUbrbe4m8oKVuHSJYLLTJ	Aloice Wang'a	Phanuel Onyango	0711617756	07020963333
34.234394	https://drive.google.com/open?id=1BGr7Wf27f6KTscMemnqrPRGJrb6BQ1R3	Elizabeth Akinyi	Ezaline Owino	0721842957	0717818117
34.36662	https://drive.google.com/open?id=1EU8N2C1P84QsopG6S24ux6OcI_5Fvgou	Rachael Otieno	Rose	0741977475	07916685345
34.331039	https://drive.google.com/open?id=1loHZpcgYzw6fK_fstyFvyvzy2kXPN8UN	Peter Otieno	Cleofas Ayugi	0724291286	0745574971
37.865107	https://drive.google.com/open?id=1QzAHhSmsJL5wj6Vz84CsF_xjf5EZJVON	Mr. Maiko	Mrs Maiko	0710477324	0742874437
38.094684	https://drive.google.com/open?id=1JltPDuJ6kcpjEEkPl4vWP8J1NF3ho5cy	Beneditt Mwalimu.	Mrs Beneditt Mwalimu	0723882599	0723882599
37.958204	https://drive.google.com/open?id=1mmbtgsm6EheAEg_ZOTlpm6QSBEPK38uD	Gabriel	Stephen	0720447076	0715627983
37.95757	https://drive.google.com/open?id=1Zhz7z36IK3TRh14UywOxmOUSW84dPvxw	Stephen	Kutendesya	0715627983	0720447076
37.955398	https://drive.google.com/open?id=1F2HEyinkZl0j58l2oN-L8r1FXQm8c8Er	Gabriel	Stephen	0720447076	0715627983
37.955601	https://drive.google.com/open?id=1ZPzWhXloas6W7n2mEdBwYBMcEUmwwLVP	Stephen	Gabriel	0715627983	0720447076
37.95701006	https://drive.google.com/open?id=1vnDz_tZYTeb5DSm_4iRU9NE4HbX8wgJ	Gabriel	Stephen	0720447076	0715627985
34.594012	https://drive.google.com/open?id=1MLzWcB2LBVQV5SLr3SQGIAsyNDID_dr1	Tom	Samuel	0718139211	0714293814

Appendix 3: Photographs of typical pump repairs

Access road to a rural pump repair

Making a joint to fit a riser.

A typical hand-pump repair, restoring access to water.