

Water–Isotope Capacity Building and Demonstration in a Developing World Context: Isotopic Baseline and Conceptualization of a Lake Malawi Catchment

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Table S1. Statistical summary of isotopic composition of precipitation ($n = 203$).

	Deuterium ($\delta^2\text{H}$) ‰	Oxygen 18 ($\delta^{18}\text{O}$) ‰	Deuterium Excess
Minimum	−121.2	−17.5	−3.72
Maximum	24.2	3.0	19.0
Mean	−29.8	−5.2	11.6
Median	−30.3	5.3	12.0
Std Dev.	22.9	2.9	4.0
Range	145.4	20.5	22.8

Table S2. Statistical summary of isotopic composition of groundwater ($n = 73$).

	Deuterium ($\delta^2\text{H}$) ‰	Oxygen 18 ($\delta^{18}\text{O}$) ‰	Deuterium Excess
Minimum	−43.9	−6.7	0.94
Maximum	−23.3	−4.2	13.0
Mean	−37.6	−5.9	9.6
Median	−38.3	−6.0	10.6
Std Dev.	3.7	0.5	3.0
Range	20.6	2.5	12.1

Table S3. Statistical summary of isotopic composition of surface water ($n=50$).

	Deuterium ($\delta^2\text{H}$) ‰	Oxygen 18 ($\delta^{18}\text{O}$) ‰	Deuterium Excess
Minimum	−44.3	−6.8	−6.4
Maximum	20.1	3.0	13.9
Mean	−14.8	−2.4	4.7
Median	−22.4	−3.7	6.1
Std Dev.	19.3	3.0	5.9
Range	64.4	9.8	20.3

SM1a: Statistical summary of hydrochemical parameters for surface water in Linthipe River Catchment and South West Lake Malawi Catchment.

Parameter	Units	N	Minimum	Maximum	Mean	Median	Std.Dev
pH	(on scale)	23	7.02	8.37	7.65	7.63	0.42
EC	(μScm^{-1})	23	71	634	251	251	143.4
TDS	(mgL^{-1})	23	42	349	145	140	80.1
CO_3	(mgL^{-1})	23	0	9.1	0.657	0.00	2.22
HCO_3	(mgL^{-1})	23	22	296	97.1	96	62.
SO_4	(mgL^{-1})	23	1.8	35	12.9	11.6	8.8
Cl	(mgL^{-1})	23	1.01	72	25.4	14.6	22.8

NO ₃	(mgL ⁻¹)	23	0.001	0.150	0.060	0.060	0.04
F	(mgL ⁻¹)	7	0.12	1.17	0.894	1.12	0.38
Na	(mgL ⁻¹)	23	5	27	12.1	11.0	6.3
K	(mgL ⁻¹)	23	0.8	25	3.45	1.50	5.1
Ca	(mgL ⁻¹)	23	4.3	76	22.6	20.50	16.1
Mg	(mgL ⁻¹)	23	2.2	23.6	9.24	8.90	6.3
Fe	(mgL ⁻¹)	16	0.547	1.05	0.696	0.663	0.14
TH	(mgL ⁻¹)	23	21	287	95.4	85.0	63.4
TA	(mgL ⁻¹)	23	18	243	80.8	79.0	51.3

SM1b: Statistical summary of hydrochemical parameters for groundwater in Linthipe River Catchment and South West Lake Malawi Catchment.

Parameter	Units	N	Minimum	Maximum	Mean	Median	Std.Dev	MS733:2005
pH	(on scale)	38	5.27	8.31	6.91	6.95	0.438	6.00–9.50
EC	(μScm^{-1})	38	220	2680	952.6	855.5	552.3	3,500
TDS	(mgL ⁻¹)	38	132	1474	541.1	505	303.1	2,000
CO ₃	(mgL ⁻¹)	38	0.00	3.0	0.079	0.00	0.487	–
HCO ₃	(mgL ⁻¹)	38	71	678	363.5	391.5	183.1	–
SO ₄	(mgL ⁻¹)	38	9.83	186	47.72	27	47.74	800
Cl	(mgL ⁻¹)	38	9.9	657	108.4	59.9	135.1	750
NO ₃	(mgL ⁻¹)	38	0.005	2.01	0.380	0.175	0.515	45
F	(mgL ⁻¹)	16	0.980	1.54	1.308	1.315	0.153	6.0
Na	(mgL ⁻¹)	38	8.0	326	70.71	55.5	65.6	500
K	(mgL ⁻¹)	38	0.60	18.9	3.25	1.950	3.81	–
Ca	(mgL ⁻¹)	38	19.3	212	87.86	89.0	53.9	250
Mg	(mgL ⁻¹)	38	6.2	64.2	23.89	21.40	12.0	250
Fe	(mgL ⁻¹)	22	0.050	0.894	0.608	0.5735	0.168	3.0
TH	(mgL ⁻¹)	38	82.0	629	318.1	315.0	153.4	800
TA	(mgL ⁻¹)	38	58.0	556	298	321.0	149.8	–

SM 2: LIST OF GROUNDWATER & SURFACE WATER SAMPLING STATIONS

SM2a: Surface Water Sampling Stations in Linthipe River Catchment and South West Lake Malawi Catchment ($n = 21$).

Sample ID	Sample location	District	T/A	Source Type	Decimal Degrees		Altitude (masl)
					Longitude	Latitude	
LRC-SW01	Nathenje River at Road Bridge	Lilongwe	Chadza	River	33.91267	−14.07984	1049
LRC-SW02	Lilongwe River at Presidential Road bridge	Lilongwe	Chimutu	River	34.32961	−13.78154	1006
LRC-SW03	Lilongwe River at confluence with Likuni River	Lilongwe	Malili	River	34.70889	−14.03472	
LRC-SW04	Lilongwe River at Bypass Road Bridge	Lilongwe	Malili	River	33.75343	−14.00958	1038
LRC-SW05	Kamuzu Dam I at Inlet point	Lilongwe	Masula	Dam	33.64033	−14.17638	1099
LRC-SW06	Kamuzu Dam I at Outlet point	Lilongwe	Masula	Dam	33.64194	−14.17450	1096
LRC-SW07	Kamuzu Dam II Outlet	Lilongwe	Masumbankhunda	Dam	33.68428	−14.16259	1099
LRC-SW08	Lake Malawa at Mtakataka	Dedza	Kachindamoto	Lake	34.60501	−14.19010	
LRC-SW09	Nadzipulu River at Road Bridge	Dedza	Kachindamoto	River	34.51393	−14.21412	512
LRC-SW10	Diamphwe River at M1 Road Bridge	Dedza	Kaphuka	River	34.08825	−14.13736	1146
LRC-SW11	Linthipe I River at M1 Road Bridge	Dedza	Kaphuka	River	34.12408	−14.17957	1164
LRC-SW12	Lake Malawi at Chipoka Harbour	Salima	Ndindi	Lake	34.52097	−13.99038	482
LRC-SW13	Lifidzi River at Lakeshore Road Bridge	Salima	Ndindi	River	34.46516	−13.91600	508
LRC-SW14	Mchololo Water Supply intake	Salima	Ndindi	River	34.42127	−14.03583	715
LRC-SW15	Lilongwe River at Khaphamthengo Village	Salima	Kalonga	River	34.38013	−13.7683	513
LRC-SW16	Linthipe River at M5 Road Bridge	Salima	Kalonga	River	34.44880	−13.77433	501
LRC-SW17	Lilongwe River at Mtanga	Salima	Kalonga	River	34.36134	−13.7710	
LRC-SW18	Lilongwe River Near Mkaladi Farm	Salima	Kalonga	River	34.32916	−13.78154	546
LRC-SW19	Linthipe River at Chisamba Village	Salima	Kalonga	River	34.40033	−13.78870	508
LRC-SW20	Linthipe River at Railway Bridge	Salima	Kalonga	River	34.45997	−13.79452	501
LRC-SW21	Lake Malawi at Ngodzi Fisheries	Salima	Kambalame	Lake	34.54649	−14.09407	498
LRC-SW22	Ngodzi River at M5 Bridge	Salima	Kambalame	River	34.51627	−14.09658	

SM2b: Groundwater Sampling Stations in Linthipe River Catchment and South West Lake Malawi Catchment ($n = 22$).

Sample ID	Sample Location	District	T/A	Source Type	Decimal Degrees		Altitude (masl)
					Longitude	Latitude	
LRC-GW01	Mwatibu F.P School	Lilongwe	Chadza	Borehole	33.91036	-14.07974	1060
LRC-GW02	Malingunde Mosque	Lilongwe	Masula	Shallow Well	33.64373	-14.17489	1095
LRC-GW03	Tanga T.C	Lilongwe	Masumbankhunda	Borehole	33.67886	-14.11569	1116
LRC-GW04	Mtanga/ Chikavala T.C	Lilongwe	Masumbankhunda	Borehole	33.67416	-14.12290	1115
LRC-GW05	Mbuna Village	Lilongwe	Mazengera	Borehole	34.05930	-14.11894	1223
LRC-GW06	Chisindo Village	Lilongwe	Mazengera	Borehole	34.08646	-14.13727	1155
LRC-GW07	Mkhalira Village	Dedza	Kachindamoto	Borehole	34.57398	-14.20597	
LRC-GW08	Mlambe School	Dedza	Kachindamoto	Borehole	34.58441	-14.20397	
LRC-GW09	Nakaladzi Clinic	Dedza	Kachindamoto	Borehole	34.54982	-14.20090	
LRC-GW10	Tidyenawo Village	Dedza	Kachindamoto	Borehole	34.57398	-14.20596	
LRC-GW11	Fwalike Village	Dedza	Kachindamoto	Borehole	34.52182	-14.22310	525
LRC-GW12	Kampini Village	Dedza	Kachindamoto	Borehole	34.51027	-14.21222	
LRC-GW13	Mbalame Village	Dedza	Kaphuka	Borehole	34.09008	-14.13772	1146
LRC-GW14	Chilunga Village	Dedza	Kaphuka	Borehole	34.12332	-13.91498	1180
LRC-GW15	Likoloma Village	Dedza	Kaphuka	Borehole	34.12222	-14.17555	
LRC-GW16	Sikatha Village	Salima	Kalonga	Borehole	34.32719	-13.79315	581
LRC-GW17	Tembwe Kuluweya vge.	Salima	Kalonga	Borehole	34.24077	-13.47124	526
LRC-GW18	Kalonga F.P School	Salima	Kalonga	Borehole	34.44880	-13.77433	506
LRC-GW19	Chimbalanga Village	Salima	Kalonga	Borehole	34.42733	-13.78390	507
LRC-GW20	Mbatamila Village	Salima	Kambalame	Borehole	34.49682	-14.11162	
LRC-GW21	Mnumbe Village	Salima	Kambalame	Borehole	34.53347	-14.0683	
LRC-GW22	Napache L.E.A School	Salima	Kambalame	Borehole	34.51209	-14.07216	

SM2b: Groundwater Sampling Stations in Linthipe River Catchment and South West Lake Malawi Catchment ($n = 21$).

Sample ID	Sample Location	District	T/A	Source Type	Decimal Degrees		Altitude (masl)
					Longitude	Latitude	
LRC-GW23	Ngodzi Fisheries	Salima	Kambalame	Borehole	34.51624	-13.9929	478
LRC-GW24	Ngodzi Trading Centre	Salima	Kambalame	Borehole	34.52071	-14.0973	498
LRC-GW25	Ngodzi-Chilambula vge.	Salima	Kambalame	Borehole	34.04583	-14.0775	
LRC-GW26	Katelera L.E.A School	Salima	Kambwiri	Borehole	34.43874	-13.8368	519
LRC-GW27	Lowe Village	Salima	Kambwiri	Borehole	34.46142	-13.9129	525
LRC-GW28	Ngolomi Village	Salima	Kambwiri	Borehole	34.42622	-13.8348	527
LRC-GW29	Ng'ombe Village	Salima	Kambwiri	Borehole	34.43110	-13.8067	518
LRC-GW30	Kambwiri School	Salima	Kambwiri	Borehole	34.41750	-13.7653	535
LRC-GW31	Liganga Village	Salima	Kambwiri	Borehole	34.43111	-13.7901	508
LRC-GW32	Mgwede Village	Salima	Kambwiri	Borehole	34.46327	-13.9149	516
LRC-GW33	Mkwenembera Village	Salima	Kambwiri	Borehole	34.46722	-13.9183	
LRC-GW34	Chipoka EPA BH. No.1	Salima	Ndindi	Borehole	34.51578	-13.9942	480
LRC-GW35	Makombe Village	Salima	Ndindi	Borehole	34.46807	-14.0060	537
LRC-GW36	Mikuju I Village	Salima	Ndindi	Borehole	34.50256	-14.0135	492
LRC-GW37	Mikuju II Village	Salima	Ndindi	Borehole	34.48100	-14.0195	520
LRC-GW38	Mlenga I Village	Salima	Ndindi	Borehole	34.50123	-14.0224	498
LRC-GW39	Mlenga II Village	Salima	Ndindi	Borehole	34.50121	-14.0224	499
LRC-GW40	Chipoka Trading Centre	Salima	Ndindi	Borehole	34.51685	-13.9921	481
LRC-GW41	Lifidzi Trading Centre	Salima	Ndindi	Borehole	34.47062	-13.9214	507
LRC-GW42	Chembe Village	Salima	Kambwiri	Borehole	34.42470	-13.94498	
LRC-GW43	Ngodzi Sec-School	Salima	Kambalame	Borehole			

SM2c: Precipitation Sampling Stations in Linthipe River Catchment and South West Lake Malawi Catchment ($n=2$).

Sample ID	Sample Location	District	T/A	Source Type	Decimal Degrees		Altitude (masl)
					Longitude	Latitude	
LRC-P01	Central Water Laboratory	Lilongwe	Njewa	Precipitation	33.7702	-13.9767	1046
LRC-P02	Salima Met Services Station	Salima	Maganga	Precipitation	34.5844	-13.7540	514

SM3a: Water Quality Data for 38 Groundwater points in Linthipe River Catchment and South West Lake Malawi Catchment sampled between 2015 and 2018.

Sample ID	Date Sampled	CATIONS						ANIONS					WATER QUALITY DATA				
		Na mg/L	K mg/L	Ca mg/L	Mg mg/L	Fe mg/L	CO ₃ mg/L	HCO ₃ mg/L	SO ₄ mg/L	Cl mg/L	NO ₃ mg/L	F mg/L	pH	EC µS/cm	TDS mg/L	TH mg/L	TA mg/L
LRC-GW13	22/06/2018	14	0.9	42.9	20.8	0.56	0	234	11.6	16.2	0.29	na	6.86	450	270	194	192
LRC-GW14	21/06/2018	22	1	31.9	15.8	0.551	0	174	17	25.5	1.95	na	6.8	389	233	146	143
LRC-GW11	21/06/2018	22	0.7	42.9	24.2	0.596	0	251	14.3	28.7	0.51	na	6.6	512	307	208	206
LRC-GW05	22/06/2018	11	1.1	29.3	13.1	0.763	0	123	23.2	18.8	0.12	na	6.66	308	183	128	101
LRC-GW06	22/06/2018	17	0.9	48.3	23.2	0.553	0	250	19.1	22.7	0.22	na	6.97	512	308	217	205
LRC-GW04	22/06/2018	16	4.5	24.9	12.6	0.576	0	71	9.83	80.3	0.38	na	6.37	311	188	115	58
LRC-GW02	22/06/2018	8	5.2	20.4	11.8	0.571	0	80	14.6	36.4	0.14	na	5.27	249	150	100	66
LRC-GW01	22/06/2018	34	2.8	77.5	36.8	0.548	0	390	40.9	43.6	0.29	na	7.03	847	509	346	320
LRC-GW40	21/06/2018	10	5.4	22.4	6.2	0.05	3	89	12.4	14.1	0.042	na	8.31	220	132	82	79
LRC-GW36	21/06/2018	32	1.5	33.2	16.9	0.57	0	153	42	38.4	0.61	na	6.42	449	269	153	125
LRC-GW24	21/06/2018	32	1.5	90.3	23.5	0.777	0	393	41.9	11.8	0.936	na	7.06	791	435	323	322
LRC-GW25	21/06/2018	58	17	91.9	38.6	0.569	0	353	61.6	136	0.08	na	7.38	1,035	621	389	289
LRC-GW31	21/06/2018	77	2.3	52.2	27.5	0.59	0	224	80.1	112	0.21	na	6.78	829	498	244	184
LRC-GW19	21/06/2018	200	3.2	101	52.8	0.55	0	430	49.1	468	0.12	na	7.04	1,815	1,090	470	352
LRC-GW18	21/06/2018	12	1.2	19.3	10.4	0.566	0	99	18.4	11.6	0.3	na	6.28	240	144	93	81
LRC-GW32	21/06/2018	62	1.8	99.7	44.9	0.831	0	332	64.3	204	0.1	na	6.92	1,155	694	435	272
LRC-GW26	21/06/2018	71	5.5	58.9	29.9	0.615	0	260	22.3	180	0.08	na	7.19	864	512	271	213
LRC-GW16	21/06/2018	38	2.3	49.1	26.8	0.587	0	166	43.5	115	2.01	na	6.77	641	384	234	136
LRC-GW12	21/06/2018	33	3.3	36.8	18.9	0.875	0	205	13.4	57.9	0.08	na	6.69	495	297	171	168
LRC-GW07	21/06/2018	30	2.2	132	64.2	0.894	0	678	33.8	59.9	0.385	na	6.95	1,359	747	595	556
LRC-GW15	21/06/2018	18	1.2	53.7	26.8	0.562	0	248	20.6	52.3	0.53	na	6.97	578	346	245	203
LRC-GW17	21/06/2018	100	4	90.9	46.3	0.613	0	492	18.7	202	0.72	na	7.06	1,281	768	418	403

*na: not analysed; 0: not detected.

Sample ID	Date Sampled	CATIONS						ANIONS					WATER QUALITY DATA				
		Na mg/L	K mg/L	Ca mg/L	Mg mg/L	Fe mg/L	CO ₃ mg/L	HCO ₃ mg/L	SO ₄ mg/L	Cl mg/L	NO ₃ mg/L	F mg/L	pH	EC µS/cm	TDS mg/L	TH mg/L	TA mg/L
LRC-GW20	15/05/2015	89	1.6	98	16.5	na	0	517	12	63.8	0.005	1.34	7.08	1,021	562	312	424
LRC-GW21	15/05/2015	92	0.6	101	23.3	na	0	525	23.1	91.2	0.048	1.54	6.96	1,119	615	348	428
LRC-GW39	15/05/2015	140	5	186	21.4	na	0	621	168	125	0.285	1.44	6.81	1,761	969	552	509
LRC-GW42	16/05/2015	50	5	156	16.5	na	0	398	109	90	0.531	1.51	6.86	1,156	636	457	326
LRC-GW27	16/05/2015	108	1.7	129	17.5	na	0	658	23.8	59.9	0.385	1.33	7.53	1,278	703	394	539

LRC-GW28	16/05/2015	74	1.8	132	23.3	na	0	659	18	26.7	0.029	1.29	6.9	825	454	425	540
LRC-GW29	16/05/2015	76	2.1	120	13.6	na	0	493	43	60	0.038	1.14	7.03	1106	608	355	404
LRC-GW37	16/05/2015	116	1.6	110	21.4	na	0	524	25.3	145	0.032	1.42	7.03	1,240	682	362	429
LRC-GW38	15/05/2015	66	3.1	212	24.3	na	0	499	186	121	0.034	1.23	6.57	1,608	884	629	409
LRC-GW34	15/05/2015	326	4.4	209	22.4	na	0	512	164	657	0.035	1.42	7.07	2,680	1,474	613	420
LRC-GW36	15/05/2015	17	1.8	89	17.4	na	0	232	55.8	59.4	0.04	1.3	6.82	669	368	294	190
LRC-GW24	15/05/2015	53	1.5	79	19.4	na	0	419	27	9.9	0.936	1.11	7.06	791	435	277	343
LRC-GW23	15/05/2015	117	1.2	54	14.6	na	0	394	46.8	62.1	0.013	1.18	7.4	913	501	195	323
LRC-GW26	16/05/2015	124	1.3	89	23.3	na	0	649	27	20.6	1.73	1.42	7.01	1,193	656	318	532
LRC-GW07	15/05/2015	126	2.2	124	20.4	na	0	513	46	183	0.056	1.28	6.95	1359	747	393	420
LRC-GW09	15/05/2015	196	18.9	201	20.4	na	0	505	166	408	0.14	0.98	6.92	2150	1183	585	414

*na: not analysed; 0: not detected.

SM3b: Water Quality Data for Surface Water points in Linthipe River Catchment and South West Lake Malawi Catchment sampled between 2015 and 2018.

Sample ID	Date Sampled	CATIONS						ANIONS					WATER QUALITY DATA				
		Na mg/L	K mg/L	Ca mg/L	Mg mg/L	Fe mg/L	CO ₃ mg/L	HCO ₃ mg/L	SO ₄ mg/L	Cl mg/L	NO ₃ mg/L	F mg/L	pH	EC µS/cm	TDS mg/L	TH mg/L	TA mg/L
LRC-SW10	22/06/2018	5	0.8	10.1	4.9	0.745	0	41	9.8	10.5	0.07	na	7.72	117	70	47	34
LRC-SW11	22/06/2018	7	1.2	17.5	8	0.749	0	80	10.7	12.9	0.09	na	7.42	189	111	78	66
LRC-SW09	21/06/2018	6	1.2	8.3	4.5	0.78	0	46	5.6	9.2	0.1	na	7.97	110	67	41	38
LRC-SW01	22/06/2018	27	1.8	32.2	16.5	0.556	0	160	12.5	58.5	0.11	na	7.63	420	251	149	131
LRC-SW04	22/06/2018	12	1.6	17.9	8.9	0.547	0	67	8.93	40.4	0.1	na	7.16	220	132	82	55
LRC-SW07	22/06/2018	5	1.5	5.3	2.5	0.603	0	24	6.1	8.6	0.08	na	7.02	74	45	25	20
LRC-SW06	22/06/2018	5	1.2	4.9	2.4	0.653	0	22	7.56	6.6	0.09	na	7.54	71	42	23	18
LRC-SW05	22/06/2018	6	1.2	4.3	2.2	0.665	0	23	5.93	8.1	0.08	na	7.1	71	43	21	19
LRC-SW12	21/06/2018	12	1.9	24.4	10.3	0.972	0	120	13.9	14.6	0.15	na	8.15	267	160	105	98
LRC-SW13	21/06/2018	9	1.4	16.3	8.41	1.05	0	76	11.6	18.6	0.05	na	7.82	198	119	77	62
LRC-SW19	21/06/2018	10	1.2	20.5	11.5	0.62	0	114	11.6	12.6	0.02	na	7.68	245	147	100	93
LRC-SW20	21/06/2018	16	1.5	37	18.6	0.587	0	136	16.8	69.6	0.06	na	7.57	415	249	170	112
LRC-SW16	21/06/2018	21	3	18.1	9.3	0.66	0	66	15.2	56.6	0.04	na	7.57	268	160	85	54
LRC-SW21	21/06/2018	11	6.7	22.8	9.6	0.581	6	104	16.1	11.1	0.09	na	8.37	260	156	97	95
LRC-SW18	21/06/2018	24	3.5	26.2	12.3	0.668	0	96	26.3	55.7	0	na	8.26	349	210	117	79
LRC-SW03	22/06/2018	8	1.5	10.3	5.1	0.696	0	47	8.04	16.6	0.11	na	7.09	134	81	48	39
LRC-SW09	15/05/2015	8	1.2	10.1	2.4	—	0	52	6.1	2.23	0	na	7.77	111	61	35	43
LRC-SW12	15/05/2015	8	6.4	23	9.6	—	9.1	126	2	2.21	0.042	na	8.31	251	138	97	118
LRC-SW14	16/05/2015	16	4.8	76	23.6	—	0	296	35	35.2	0.03	na	7.9	634	349	287	243
LRC-SW13	16/05/2015	15	25	42.6	9.5	—	0	176	1.8	34.8	0.035	na	7.13	370	203	145	144
LRC-SW16	16/05/2015	13	3.2	43	23.4	—	0	135	34.3	72.9	0.034	na	8.01	476	261	204	111
LRC-SW21	15/05/2015	18	1.2	26.8	2.4	—	0	126	14.1	1.01	0	na	7.07	254	140	77	103
LRC-SW08	15/05/2015	17	6.3	23	6.6	—	0	101	17.4	25	0	na	7.61	267	147	85	83

*na: not analysed; 0: not detected.

SM4a: Stable Isotopic Composition of Groundwater in Linthipe River Catchment and South West Lake Malawi Catchment.

Sample ID	Sample Location	District	T/A	Source Type	Sample Date	$\delta^2\text{H}$ (‰)	$\delta^{18}\text{O}$ (‰)	D- Excess
LRC-GW34	Chipoka EPA	Salima	Ndindi	Borehole	06/08/2015	-41.9	-5.50	2.10
LRC-GW34	Chipoka EPA	Salima	Ndindi	Borehole	15/05/2015	-40.2	-6.35	10.6
LRC-GW34	Chipoka EPA	Salima	Ndindi	Borehole	03/12/2017	-37.8	-5.95	9.80
LRC-GW40	Chipoka T.C	Salima	Ndindi	Borehole	07/03/2014	-39.3	-6.26	10.8
LRC-GW40	Chipoka T.C	Salima	Ndindi	Borehole	03/12/2017	-24.0	-4.31	10.5
LRC-GW40	Chipoka T.C	Salima	Ndindi	Borehole	06/08/2017	-41.5	-5.44	2.00
LRC-GW41	Lifidzi Trading Centre	Salima	Ndindi	Borehole	06/08/2015	-40.5	-5.33	2.10
LRC-GW36	Mikujju I Village	Salima	Ndindi	Borehole	03/12/2017	-33.4	-5.65	11.8
LRC-GW36	Mikujju I Village	Salima	Ndindi	Borehole	07/03/2014	-38.6	-6.28	11.6
LRC-GW36	Mikujju I Village	Salima	Ndindi	Borehole	15/05/2015	-37.4	-5.92	10.0
LRC-GW37	Mikujju II Village	Salima	Ndindi	Borehole	06/08/2015	-43.9	-5.80	2.50
LRC-GW37	Mikujju II Village	Salima	Ndindi	Borehole	16/07/2015	-41.7	-6.69	11.8
LRC-GW37	Mikujju II Village	Salima	Ndindi	Borehole	03/12/2017	-35.4	-6.05	13.0
LRC-GW36	Mikujju I Village	Salima	Ndindi	Borehole	21/06/2018	-36.9	-6.10	11.9
LRC-GW38	Mlenga I Village	Salima	Ndindi	Borehole	03/12/2017	-37.4	-6.01	10.7
LRC-GW38	Mlenga I Village	Salima	Ndindi	Borehole	15/05/2015	-38.8	-6.16	10.5
LRC-GW39	Mlenga II Village	Salima	Ndindi	Borehole	03/12/2017	-35.2	-5.65	10.0
LRC-GW39	Mlenga II Village	Salima	Ndindi	Borehole	15/05/2015	-36.1	-5.72	9.66
LRC-GW38	Mlenga I Village	Salima	Ndindi	Borehole		-23.3	-4.16	10.0
LRC-GW38	Mlenga I Village	Salima	Ndindi	Borehole	06/08/2015	-41.7	-5.33	0.94
LRC-GW27	Lowe Village	Salima	Kambwiri	Borehole	03/12/2017	-35.8	-5.82	10.8
LRC-GW28	Ngolomi Village	Salima	Kambwiri	Borehole	03/12/2017	-38.6	-6.21	11.1
LRC-GW29	Ng'ombe Village	Salima	Kambwiri	Borehole	03/12/2017	-39.3	-6.36	11.6
LRC-GW30	Kambwiri F.P. School	Salima	Kambwiri	Borehole		-27.9	-4.79	10.4
LRC-GW30	Kambwiri F.P. School	Salima	Kambwiri	Borehole	06/07/2017	-39.8	-5.27	2.40
LRC-GW26	Katelera F.P School	Salima	Kambwiri	Borehole	07/03/2014	-38.5	-6.09	10.2
LRC-GW26	Katelera F.P School	Salima	Kambwiri	Borehole	06/08/2015	-39.6	-5.40	3.60
LRC-GW26	Katelera Village	Salima	Kambwiri	Borehole	07/03/2014	-38.6	-6.23	11.2

Sample ID	Sample Location	District	T/A	Source Type	Sample Date	$\delta^2\text{H}$ (‰)	$\delta^{18}\text{O}$ (‰)	D- Excess
LRC-GW07	Mkhalira Village	Dedza	Kachindamoto	Borehole	02/12/2017	-37.3	-6.05	11.1
LRC-GW08	Mlambe School	Dedza	Kachindamoto	Borehole	02/12/2017	-35.9	-5.90	11.3
LRC-GW09	Nakaladzi Clinic	Dedza	Kachindamoto	Borehole	02/12/2017	-36.6	-6.03	11.6
LRC-GW10	Tidyenawo Village	Dedza	Kachindamoto	Borehole	02/12/2017	-38.0	-6.11	10.9
LRC-GW07	Mkhalira Village	Dedza	Kachindamoto	Borehole	07/03/2014	-39.6	-6.30	10.8

LRC-GW07	Mkhalira Village	Dedza	Kachindamoto	Borehole	15/05/2015	−38.5	−6.17	10.9
LRC-GW11	Fwalikire Village	Dedza	Kachindamoto	Borehole	21/06/2018	−40.0	−6.28	10.2
LRC-GW07	Mkhalira Village	Dedza	Kachindamoto	Borehole	21/06/2018	−38.8	−5.94	8.70
LRC-GW12	Kampini Village	Dedza	Kachindamoto	Borehole	21/06/2016	−37.9	−5.95	9.70
LRC-GW13	Mbalame Village	Dedza	Kaphuka	Borehole	05/08/2015	−39.5	−5.48	4.30
LRC-GW14	Chilunga Village	Dedza	Kaphuka	Borehole	21/06/2018	−40.6	−6.37	10.4
LRC-GW15	Likoloma Village	Dedza	Kaphuka	Borehole	21/06/2018	−38.2	−5.69	7.30
LRC-GW13	Mbalame Village	Dedza	Kaphuka	Borehole	21/06/2018	−39.5	−6.05	8.90
LRC-GW05	Mbuna Village	Lilongwe	Mazengera	Borehole	05/08/2015	−36.3	−5.16	5.00
LRC-GW02	Malingunde Mosque	Lilongwe	Masula	Shallow Well	22/06/2018	−40.1	−6.31	10.4
LRC-GW04	Mtanga/Chikavala T.C	Lilongwe	Masumbankhunda	Borehole	22/06/2018	−40.2	−6.14	8.90
LRC-GW04	Mtanga/Chikavala T.C	Lilongwe	Masumbankhunda	Borehole	05/08/2018	−38.3	−5.54	6.00
LRC-GW01	Mwatibu F.P School	Lilongwe	Chadza	Borehole	22/06/2018	−31.8	−5.31	10.7
LRC-GW06	Chisindo Village	Lilongwe	Mazengera	Borehole	22/06/2018	−37.5	−5.91	9.80
LRC-GW05	Mbuna Village	Lilongwe	Mazengera	Borehole	22/06/2018	−33.7	−5.66	11.6

SM4b: Stable Isotopic Composition of Surface Water in Linthipe River Catchment and South West Lake Malawi Catchment.

Sample ID	Sample Location	District	Traditional Authority	Source Type	Sample Date	$\delta^2\text{H}$ (‰)	$\delta^{18}\text{O}$ (‰)	D- Excess
LRC-SW01	Nathenje River at M1 Road Bridge	Lilongwe	Chadza	River	22/06/2018	−28.8	−4.70	8.80
LRC-SW02	Lilongwe River at Independence Drive Road bridge	Lilongwe	Chimutu	River	05/08/2015	−27.4	−3.82	3.16
LRC-SW02	Lilongwe River at Independence Drive Road bridge	Lilongwe	Chimutu	River		−12.3	−2.24	5.62
LRC-SW07	Kamuzu Dam II Outlet	Lilongwe	Masula	Dam	05/08/2015	−20.9	−3.38	6.14
LRC-SW07	Kamuzu Dam II Outlet	Lilongwe	Masula	Dam	22/06/2018	−25	−4.28	9.24
LRC-SW05	Kamuzu Dam I at Inlet point	Lilongwe	Masula	Dam	22/06/2018	−26.4	−4.49	9.52
LRC-SW06	Kamuzu Dam I at Outlet point	Lilongwe	Masula	Dam	22/06/2018	−26.2	−4.58	10.4
LRC-SW04	Lilongwe River at Bypass Road bridge	Lilongwe	Malili	River		−7.90	−1.52	4.26
LRC-SW04	Lilongwe River at Bypass Road Bridge	Lilongwe	Malili	River	05/08/2015	−22.6	−3.44	4.92
LRC-SW04	Lilongwe River at Bypass Road Bridge	Lilongwe	Malili	River	22/06/2018	−26.3	−4.37	8.66
LRC-SW03	Lilongwe River at Confluence with Likuni River	Lilongwe	Malili	River	22/06/2018	−25.7	−4.31	8.78
LRC-SW08	Lake Malawi at Mtakataka	Dedza	Kachindamoto	Lake	02/12/2017	18.7	2.92	−4.66
LRC-SW08	Lake Malawi at Mtakataka	Dedza	Kachindamoto	Lake	07/03/2014	4.30	0.60	−0.50
LRC-SW08	Lake Malawi at Mtakataka	Dedza	Kachindamoto	Lake	15/05/2015	14.4	2.31	−4.08
LRC-SW09	Nazipulu River at M5 Road Bridge	Dedza	Kachindamoto	River	02/12/2017	−22	−4.03	10.2
LRC-SW09	Nazipulu River at M5 Road Bridge	Dedza	Kachindamoto	River	21/06/2018	−30.8	−5.12	10.2
LRC-SW09	Nazipulu River at M5 Road Bridge	Dedza	Kachindamoto	River	15/05/2015	−31.0	−5.12	10.0
LRC-SW10	Diamphwe River at M1 Road Bridge	Dedza	Kaphuka	River	05/08/2015	−19.1	−2.51	0.98
LRC-SW10	Diamphwe River at M1 Road Bridge	Dedza	Kaphuka	River	21/06/2018	−24	−3.98	7.84

LRC-SW11	Linthipe I River at M1 Road Bridge	Dedza	Kaphuka	River	21/06/2018	−31.3	−5.08	9.34
LRC-SW11	Linthipe I River at M1 Road Bridge	Dedza	Kaphuka	River	05/08/2015	−31.1	−4.24	2.82
LRC-SW17	Lilongwe River at Mtonga Village	Salima	Kalonga	River	06/08/2015	−13.8	−0.93	−6.36
LRC-SW16	Linthipe River at M5 Road bridge	Salima	Kalonga	River	03/12/2017	−19.0	−3.86	11.9
LRC-SW16	Linthipe River at M5 Road bridge	Salima	Kalonga	River	06/08/2015	−22.4	−2.46	−2.72
LRC-SW16	Linthipe River at M5 Road bridge	Salima	Kalonga	River	16/05/2015	−23.3	−3.72	6.46
LRC-SW16	Linthipe River at M5 Road bridge	Salima	Kalonga	River		−6.80	−0.88	0.24

Sample ID	Sample Location	District	Traditional Authority	Source Type	Sample Date	δ ² H (‰)	δ ¹⁸ O (‰)	D- Excess
LRC-SW15	Lilongwe River at Khaphamthengo Village	Salima	Kalonga	River	03/12/2017	−19.5	−4.18	13.9
LRC-SW18	Lilongwe River at Road Bridge Near Mkaladi Farm	Salima	Kalonga	River	21/06/2018	−22.6	−3.52	5.56
LRC-SW19	Linthipe River at Chisamba Village	Salima	Kalonga	River	21/06/2018	−23.6	−3.86	7.28
LRC-SW22	Ngodzi River at M5 Shore Road Bridge	Salima	Kambalame	River	03/12/2017	−18.0	−3.63	11.0
LRC-SW22	Ngodzi River at M5 Road Bridge	Salima	Kambalame	River	15/05/2015	−22.4	−3.56	6.08
LRC-SW21	Lake Malawi at Ngodzi Fisheries	Salima	Kambalame	Lake	03/12/2017	18.8	2.95	−4.80
LRC-SW21	Lake Malawi at Ngodzi Fisheries	Salima	Kambalame	Lake	15/05/2015	15.3	2.22	−2.46
LRC-SW21	Lake Malawi at Ngodzi Fisheries	Salima	Kambalame	Lake	21/06/2018	16.0	2.30	−2.40
LRC-SW12	Lake Malawi at Chipoka Harbour	Salima	Ndindi	Lake	07/03/2014	10.0	1.60	−2.80
LRC-SW12	Lake Malawi at Chipoka Harbour	Salima	Ndindi	Lake	03/12/2017	20.1	2.71	−1.58
LRC-SW12	Lake Malawi at Chipoka Harbour	Salima	Ndindi	Lake	06/08/2015	15.5	1.64	2.38
LRC-SW12	Lake Malawi at Chipoka Harbour	Salima	Ndindi	Lake	15/05/2015	14.0	2.23	−3.84
LRC-SW12	Lake Malawi at Chipoka Harbour	Salima	Ndindi	Lake	03/12/2017	16.8	2.39	−2.32
LRC-SW12	Lake Malawi at Chipoka Harbour	Salima	Ndindi	Lake	21/06/2018	15.7	2.41	−3.58
LRC-SW12	Lake Malawi at Chipoka Harbour	Salima	Ndindi	Lake		15.3	2.33	−3.34
LRC-SW13	Lifidzi River at Lakeshore Road Bridge	Salima	Ndindi	River	03/12/2017	−17.6	−3.34	9.12
LRC-SW13	Lifidzi River at Lakeshore Road Bridge	Salima	Ndindi	River	07/03/2014	−31.7	−5.45	11.9
LRC-SW13	Lifidzi River at Lakeshore Road Bridge	Salima	Ndindi	River	16/05/2015	−29.2	−4.45	6.40
LRC-SW13	Lifidzi River at Lakeshore Road Bridge	Salima	Ndindi	River	21/06/2018	−30.2	−4.68	7.24
LRC-SW14	Mchololo Water Supply intake	Salima	Ndindi	River		−31.8	−5.49	12.1
LRC-SW14	Mchololo Water Supply intake	Salima	Ndindi	River	16/05/2015	−41.9	−6.84	12.8
LRC-SW14	Mchololo Water Supply intake	Salima	Ndindi	River	07/03/2014	−34.6	−5.61	10.3
LRC-SW14	Mchololo Water Supply intake	Salima	Ndindi	River	06/08/2015	−44.3	−5.90	2.90
LRC-SW14	Mchololo Water Supply intake	Salima	Ndindi	River	03/12/2017	−40.7	−6.76	13.4