Table S1. Summary results of MK, Z statistics on monthly rainfall trends. Negative/positive Z value indicates a decreasing/increasing trend and in bold a statistical significant trend at 5 % confidence level (Z= ±1.96).

Station	Statistics	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Makele (AP)	Z	-1.04	-0.57	0.54	-1.56	0.44	1.07	-0.38	-1.45	-1.40	**2.10**	1.67	**5.45**
	P	0.30	0.56	0.60	0.13	0.66	0.30	0.57	0.39	0.16	**0.04**	0.1	**0.00**
Adigrat	Z	0.95	-0.66	0.32	-0.23	1.16	0.48	-1.18	-1.07	-1.41	0.56	-0.17	**1.99**
	P	0.34	0.51	0.79	0.82	0.25	0.65	0.24	0.33	0.39	0.58	-0.09	**0.04**
Mychew	Z	1.90	**-2.86**	-1.14	-0.56	1.13	0.94	0.32	0.35	0.26	0.68	2.24	-0.28
	P	0.06	**0.02**	0.26	0.58	0.26	0.35	0.75	0.73	0.80	0.50	**0.026**	0.78
Shire	Z	0.82	-0.64	1.32	-0.38	1.32	**2.64**	-0.65	0.28	**2.29**	0.28	0.52	0.18
	P	0.41	0.53	0.19	0.68	0.21	**0.02**	0.63	0.74	**0.02**	0.77	0.61	0.86
D/tabour	Z	**2.44**	**2.11**	1.83	0.72	0.69	-0.04	-1.90	-1.93	-0.55	0.14	**2.17**	**3.59**
	P	**0.05**	**0.04**	0.06	0.47	0.48	0.95	0.07	0.07	0.54	0.21	**0.03**	**0.00**
Mykinetal	Z	**-2.95**	**-2.40**	-0.96	-1.90	-0.50	0.49	-1.79	1.21	**2.60**	-0.72	-1.19	**-2.36**
	P	**0.003**	**0.02**	0.34	0.06	0.62	0.55	0.08	0.20	**0.01**	0.50	0.24	**0.04**
Gonder	Z	-1.49	0.15	-1.41	0.59	0.25	1.01	0.28	0.13	0.52	0.17	-1.66	-1.79
	P	0.14	0.88	0.16	0.54	0.70	0.41	0.78	0.87	0.66	0.87	0.10	0.08
Adigudem	Z	**4.98**	**-2.56**	0.22	0.98	-0.47	-0.68	0.36	0.21	0.24	-0.23	**3.95**	**5.26**
	P	**0.001**	**0.01**	0.83	0.09	0.65	0.16	0.62	0.16	0.81	0.82	**0.001**	**0.001**
H/selam	Z	0.00	-1.13	-1.65	-2.99	0.48	-0.27	-0.62	0.19	0.12	-0.51	-0.58	1.42
	P	0.98	**0.001**	0.23	0.68	0.65	0.75	0.11	0.80	0.92	0.56	0.16	**0.03**
Hawzen	Z	-0.48	-1.60	-0.51	-0.55	-0.42	0.08	-0.08	0.37	0.07	-0.91	0.00	-1.13
	P	0.11	0.06	0.55	0.58	0.40	0.93	0.92	0.40	0.92	0.36	1.0	0.26
Wukro	Z	**-6.15**	**-3.79**	-1.48	-0.90	-1.95	1.11	0.10	1.10	-1.09	-0.88	-1.30	**-2.60**
	P	**0.001**	**0.001**	0.14	0.35	0.06	0.22	0.75	0.22	0.38	0.38	0.20	**0.01**
Abiadi	Z	-1.56	-1.90	**-2.27**	**-2.27**	-1.85	1.78	0.72	0.32	1.73	-0.58	-0.40	**2.98**
	P	0.12	0.06	**0.02**	**0.02**	0.06	0.06	0.10	0.14	0.06	0.56	0.71	**0.00**
Demgolat	Z	-1.47	**-3.44**	0.05	-0.08	1.09	0.03	0.13	1.82	0.01	**-2.12**	-0.48	**-2.42**
	P	0.14	**0.001**	0.95	0.86	0.31	0.97	0.83	0.06	0.99	**0.03**	0.63	**0.02**
E/hamus	Z	-1.63	**-1.10**	**-2.45**	-1.62	-1.02	-0.95	0.21	-0.64	-0.59	-0.86	0.33	-1.58
	P	0.10	**0.04**	**0.02**	0.08	0.31	0.39	0.85	0.53	0.56	0.39	0.74	0.08
Adwa	Z	0.25	-0.76	0.24	0.33	1.01	0.96	0.81	**2.19**	1.32	0.35	1.13	0.48
	P	0.68	0.45	0.81	0.74	0.30	0.29	0.23	**0.01**	0.12	0.73	0.27	0.09
Axum	Z	-1.64	-3.52	-1.09	0.20	0.12	0.61	-0.72	0.91	2.25	-1.26	-0.02	0.53
	P	0.10	**0.00**	0.32	0.81	0.83	0.43	0.48	0.26	**0.03**	0.21	0.98	0.60
Debark	Z	1.34	**-2.94**	1.70	0.31	0.82	1.20	1.92	0.51	-0.43	-0.97	-1.11	0.17
	P	0.18	**-0.001**	0.12	0.61	0.44	0.09	0.06	0.36	0.51	0.33	0.29	0.87
Lalibela	Z	1.10	1.74	0.85	-0.22	1.28	1.32	1.17	2.59	4.41	0.71	0.06	0.67
	P	0.27	**0.05**	0.40	0.83	0.23	0.20	0.11	**0.01**	**0.001**	0.48	0.95	**0.01**
Samre	Z	-6.68	-1.22	-0.54	-0.14	-0.68	-2.21	-0.08	-0.04	0.89	-0.29	-1.04	-2.17
	P	**0.001**	**0.03**	0.59	0.90	0.50	0.03	0.91	0.95	0.37	0.77	0.30	**0.03**

5   Table S2. Summary results of Pettitt test on seasonal rainfall. Negative/positive K value indicates a decreasing/increasing trend and in bold a statistical significant trend at 5 % confidence level.

Station name	Statistical indices	Periods/season			
		annual	Rainy	Dry season	Short rainy
Mekelle (AP)	K	122	60	129	200
	P	0.55	1.0	0.52	0.10
Mychew	K	230	212.	242	174
	P	0.20	0.3	0.18	0.549
Axum	K	242	168	148	100
	P	**0.04**	0.30	0.44	0.85
Gonder	K	131	126	146	122
	P	0.51	0.55	0.38	0.60
Adwa	K	360	301	177.	135
	P	0.06	**0.01**	0.21	0.52
Mykinetal	K	122	109	184	184.
	P	0.56	0.68	0.13	0.13
Shire	K	-242	178	184	152
	P	**0.03**	0.12	0.11	0.25
Adigrat	K	167	165	91	93
	P	0.20	0.21	0.85	0.83
Adigudem	K	122	60	129	200
	P	0.55	1.0	0.52	0.10
Edagahamus	K	78	112	218	121
	P	0.07	0.52	0.03	0.11
Hawzen	K	96	184	218	201
	P	0.83	0.16	0.06	0.10
Hagereselam	K	122	118	112	105
	P	0.50	0.08	0.61	-0.70
AbiAdi	K	150	176	112	-176
	P	0.06	0.08	0.09	0.07
Debretabour	K	137	188	176	97
	P	0.34	0.05	0.06	0.65
Dengolat	K	162	162	140	64
	P	0.09	0.10	0.20	0.94
Lalibela	K	72	64	108	127
	P	0.28	0.41	0.33	0.13
Wukro	K	100	158	230	186
	P	0.42	0.05	0.09	0.11
Kulmesk	K	16	14	20	32
	P	0.65	0.77	0.41	0.05
Debark	K	54	82	71	68
	P	0.04	0.06	0.15	0.17
Samre	K	184	118	85	67
	P	0.16	0.64	0.07	0.05

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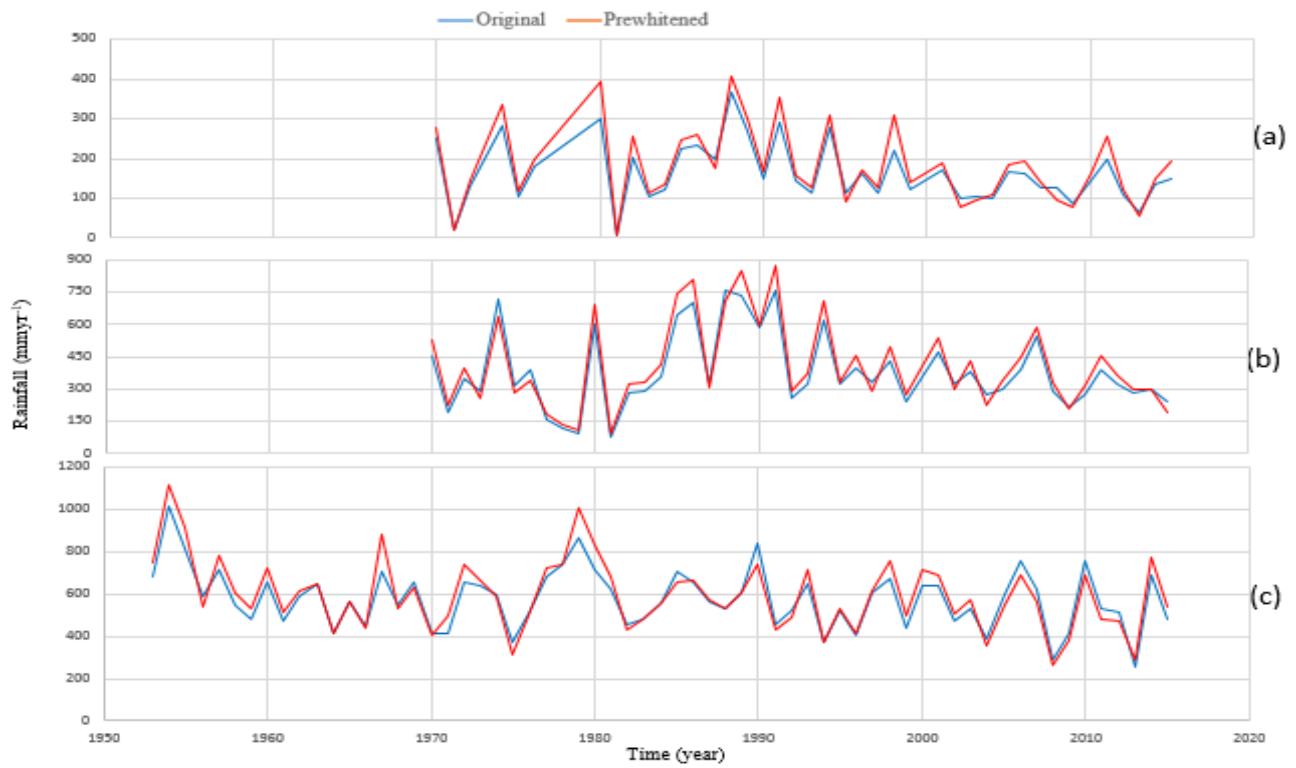
Figure. S1: Comparison of rainfall data before and after removal of auto-correlation: (a) monthly rainfall in Adigrat for August, (b) main rainy season in Adigrat, (c) annual rainfall in Mekelle (AP)
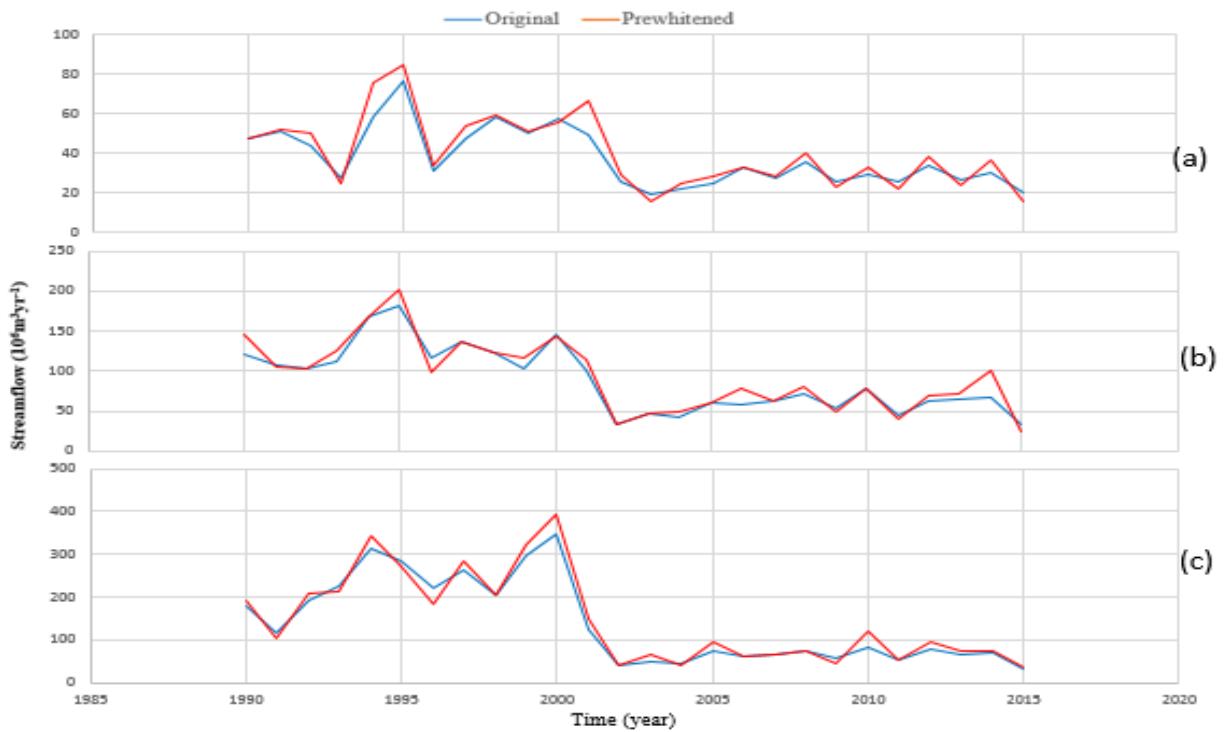
Figure. S2: Comparison of streamflow data before and after removal of auto-correlation at Geba 1 station: (a) monthly for August, (b) main rainy season, (c) annual
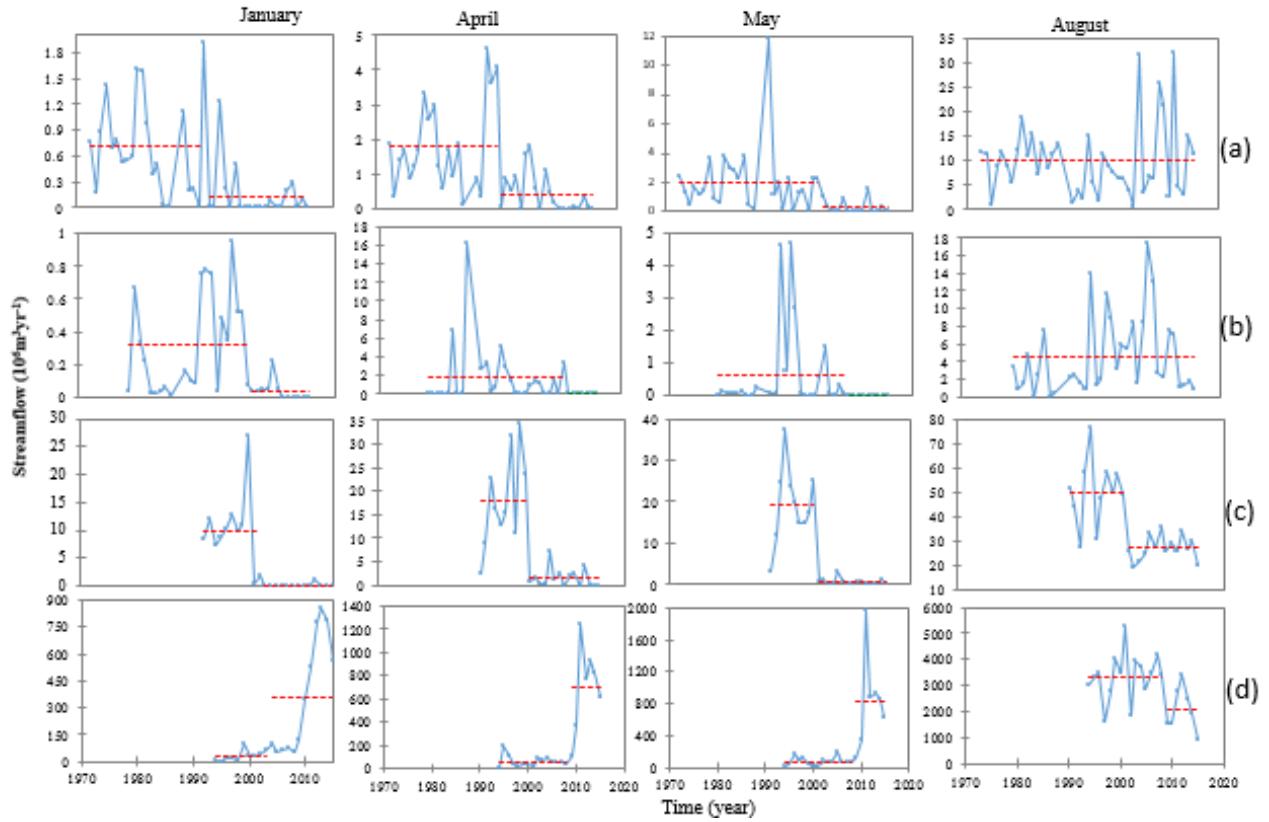
Figure S3. Pettitt homogeneity test on monthly streamflow for selected stations (a) Siluh, (b) Illala, (c) Geba 1, (d) Emabamadre.

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