

Appendix E Groundwater studies that applied WQI and HPI in arid and semiarid areas

S/no	Study	Region/Country	Water Quality Indices		Statistical Analysis [Pearson's Correlation(<i>r</i>)]	Controls on water quality	
			WQI	HPI		Natural	Anthropogenic
1	Abbasnia et al. (2018)	Sistan-Baluchistan, Iran	√				
2	Abu Al Naeem <i>et al.</i> (2019)	Gaza coastal aquifer, Palestine			√	√	√
3	Abu Khatita et al. (2014)	South Eastern Sinai, Egypt		√			
4	Acikel and Ekmekci (2018)	Azmak Spring Zone, Mugla, Turkey				√	
5	Adimalla (2019)	Telangana State, India	√				
6	Adimalla and Li (2018)	Telangana State, India				√	
7	Adimalla and Wu (2019)	Central Telangana, India				√	√
8	Adimalla et al. (2018)	Nirmal Province, India				√	
9	Agoubi and Gzam (2016)	Ghannouch field, SE Tunisia				√	√
10	Agoubi <i>et al.</i> (2013)	Marine Jeffara Aquifer, SE Tunisia			√	√	
11	Agoubi <i>et al.</i> (2014)	Coastal Arid Area, SE Tunisia			√	√	
12	Alarcon-Herrera et al. (2013)	Semiaridregions in Latin America			√	√	√
13	Al-Farraj <i>et al.</i> (2013)	Kharj, Riyadh Saudi Arabia			√	√	√
14	Aminiyan <i>et al.</i> (2016)	Rafsanjan plain, Iran			√		√
15	Aminiyan et al. (2018)	Karoon River, Iran	√		√		
16	Amiri <i>et al.</i> (2016)	Urmia aquifer, NW Iran			√	√	
17	Ayadi <i>et al.</i> (2018)	Teboursouk area NW, Tunisian Atlas				√	√
18	Bahloul <i>et al.</i> (2018)	Sfax Solar Saltern, Tunisia				√	√
19	Barakat <i>et al.</i> (2016)	Oum Er Rabia River, Morocco			√	√	√
20	Barzegar, Asghari Moghaddam, Soltani, <i>et al.</i> (2017)	Shabestar Area, Northwestern Iran			√	√	√
21	Basahi et al. (2018)	Wadi Baysh Basin, Saudi Arabia		√	√	√	√
22	Batayneh and Zumlot (2012)	Yarmouk Basin of North Jordan				√	
23	Batsaikhan <i>et al.</i> (2018)	Ulaanbaatar City, Mongolia				√	√
24	Belkhiri and Mouni (2014)	Soummam Basin, Algeria					√
25	Belkhiri et al. (2010)	Ain Azel plain, Algeria				√	
25	Belkhiri et al. (2010a)	Ain Azel plain, Algeria				√	
27	Belkhiri et al. (2010b)	Ain Azel plain, Algeria					
28	Bencer et al. (2016)	Ain Djacer area, Eastern Algeria			√	√	√

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			WQI	HPI		Natural	Anthropogenic
29	Bhakar and Singh (2018)	Rajasthan, India					
30	Boughariou et al. (2018)	Sfax coastal aquifer, SW Tunisia				√	
31	Bouterraa et al. (2019)	Boumerzoug-El Khroub, NE Algeria	√			√	
32	Carlson et al. (2011)	Tucson Basin, USA					√
33	Chaves et al. (2019)	Brazilian semiaridregion					√
34	Dehghanzadeh <i>et al.</i> (2014)	Urmia Salt Lake Basin				√	√
35	Ehya and Marbouti (2016)	Behbahan plain, SW Iran		√	√		
36	El Alfy et al. (2017)	Riyadh, Saudi Arabia				√	√
37	El Yaouti et al. (2009)	Bou-Areg (NE Morocco)				√	√
38	El-Ameir (2017)	Damietta Branch of Nile River, Egypt		√			
39	Eslami et al. (2019)	Jiroft, Iran	√			√	
40	Gasmi <i>et al.</i> (2016)	Wadi El Bey, Tunisia				√	√
41	Gomes <i>et al.</i> (2018)	Iberian Peninsula, Portugal					√
42	Gubran <i>et al.</i> (2019)	Wadi Nisah, Central Saudi Arabia			√	√	√
43	Hamdi <i>et al.</i> (2018)	Sisseb El Alem Nadhour Saouaf, Tunisia	√			√	√
44	Hamzaoui-Azaza <i>et al.</i> (2011)	Zeuss–Koutine aquifer, SE Tunisia			√	√	
45	Hamzaoui-Azaza <i>et al.</i> (2015)	Jeffara of Medenine, Southern Tunisia				√	√
46	Jampani <i>et al.</i> (2018)	Hyderabad, India					√
47	Jassas and Merkel (2015)	Al-Khazir Gomal Basin, Northern Iraq			√	√	
48	Kaba <i>et al.</i> (2016)	Littoral aquifer, Northern Senegal				√	√
49	Karroum et al. (2017)	Central Morocco			√	√	
50	Ketata-Rokbani et al. (2011)	El Khairat, Tunisian Sahel	√				
51	Khazaala et al. (2019)	Lake Habbaniyah, Al-Anbar, Iraq		√			
52	Kolsi <i>et al.</i> (2013)	Hajeb Elyoun–Jelma, Central Tunisia			√	√	√
53	Kraiem <i>et al.</i> (2014)	Chott Djerid, south-western Tunisia			√	√	√
54	Krishna <i>et al.</i> (2019)	Hyderabad, India				√	√
55	M. A. Kuisi and A. Abdel-Fattah (2010)	Amman Zarqa Basin, Jordan			√	√	√
56	Kumar <i>et al.</i> (2009)	Delhi, India				√	√
57	Kumssa et al. (2009)	North Rift and North Eastern Kenya		√			
58	Kwami <i>et al.</i> (2019)	Gombe and Environs, NE Nigeria				√	√

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59	Kwaya et al. (2017)	Yobe State, NE Nigeria		√	√	√	√
60	Kwaya et al. (2019)	Maru and environs, NW, Nigeria		√	√	√	√
61	M'nassri et al. (2019)	Ouled Chamekh Plain, Tunisia			√	√	√
62	Ma et al. (2016)	Yellow River, China		√	√	√	√
63	Machiwal and Jha (2015)	Aravalli range, western India	√			√	√
64	Mahfooz et al. (2019)	Faisalabad, Pakistan	√			√	√
65	Masoud et al. (2016)	Tanta District, Egypt					√
66	Masoud et al. (2018)	Dakhla Oasis, Egypt				√	√
67	Maurya and Srivastava (2019)	Agra districts of Uttar Pradesh, India		√	√		√
68	Mehrabi et al. (2015)	Ahangaran, west of Iran		√	√	√	√
69	Merzougui et al. (2019)	Beni-Ounif syncline, SW Algeria				√	
70	Modibo Sidibé et al. (2019)	Sahel Region in Africa				√	
71	Monjerezi and Ngongondo (2012)	Lower Shire Valley, Malawi	√			√	
72	Monjerezi et al. (2011)	Lower Shire River valley, Malawi:				√	
73	Monjerezi et al. (2011)	Lower Shire River valley, Malawi			√		
74	Mountadar et al. (2018)	Sidi Abed-Ouled Ghanem, Morocco			√	√	
75	Murgulet et al. (2018)	Gulf of Mexico, USA			√	√	
76	Nadiri et al. (2013)	Tasuj plain aquifer, Iran			√	√	√
77	Noshadi and Ghafourian (2016)	Fars province, Iran				√	√
78	Ogwueleka (2015)	Kaduna River, Nigeria	√			√	√
79	Pei-yue et al. (2010)	Ningxia, Northwest China	√				
80	Qishlaqi et al. (2018)	Ravar plain, Southeast Iran				√	
81	Qishlaqi et al. (2018)	Ravar plain, Southeast Iran				√	
82	Dehbandi et al. (2019)	Southeast of Iran				√	
83	Rachid et al. (2014)	Wadi Ouazzi Basin, Morocco				√	
84	Rafiee et al. (2019)	Zanjan Province, Tehran Iran		√	√	√	√
85	Rakotondrabe et al. (2018)	Bétaré-Oya, East-Cameroon		√	√		√
86	Rasool et al. (2015)	Punjab, Pakistan				√	√
87	Rasool et al. (2016)	Punjab, Pakistan			√	√	√
88	Rocha et al. (2015)	Upper Jaguaribe River, Brazil	√				

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89	Sadat-Noori et al. (2013)	Saveh-Nobaran aquifer, Iran	√		√		
90	Sahu <i>et al.</i> (2018)	Lalganj Tehsil, Raebareli, India			√	√	
91	Sajil Kumar (2019)	Tamil Nadu, India			√	√	√
92	Sakram <i>et al.</i> (2018)	Zaheerabad area, Telangana, India			√	√	√
93	Singh et al. (2013)	Bokaro, Central African Republic	√				
94	Singh et al. (2013)	Delhi, India				√	
95	Singh. <i>et al.</i> (2010)	Shiwaliks of Punjab, India				√	
96	Soltani <i>et al.</i> (2017)	Kordkandi-Duzduzan plain, NW Iran:			√	√	√
97	Subba Rao et al. (2019)	Wanaparthy District, Telangana, India,	√			√	√
98	Sudheer Kumar <i>et al.</i> (2017)	Nalgonda District, India			√	√	√
99	Tlili-Zrelli <i>et al.</i> (2012)	Grombalia, Northeastern Tunisia				√	
100	Trabelsi and Zouari (2019)	Takelsa syncline, NE Tunisia				√	√
101	Trabelsi <i>et al.</i> (2012)	Djeffara, Southeastern Tunisia			√	√	
102	Vasanthavigar et al. (2010)	Tamilnadu, India	√				
103	Vasanthavigar <i>et al.</i> (2012)	Thirumanimuthar sub-basin, Tamil Nadu, India				√	√
104	Vesali Naseh et al. (2018)	Ghaen Plain, Iran		√			
105	Wilson et al. (2008)	Mayo Tsanaga River Basin, Cameroon	√		√		
106	Woocay and Walton (2008)	Amargosa Desert, Nevada				√	√
107	Wu et al. (2017)	Northwest, China			√	√	√
108	Xiao et al. (2014)	Tarim River Basin, NW China	√		√		
109	Yazidi et al. (2017)	Ichkeul Lake, Northern Tunisia		√	√		
110	Yu et al. (2012)	Wuliangshuai Lake, Mongolia					√
111	Yu et al. (2013)	Miyun County, Northern China				√	
112	Yu et al. (2018)	Northwestern China			√	√	
113	X. Zhang <i>et al.</i> (2014)	Yinchuan plain, in northwest China			√	√	√
114	Zhu <i>et al.</i> (2017)	Jungar region, Northwestern China				√	√