

SUPPLEMENTARY MATERIAL

Table S1. Summary of the studies used in this systematic review, where the data extracted are detailed. Ecosystems: river (1), lake (2), reservoir (3), urban water body (4), groundwater (5), stream (6), wetland (7), peatland (8) and, ecosystem not specified, the organism was purchased at markets (9); Sample type: biota (B), sediment (S) and, water (W). The data on ecosystem and sample type were not extracted from systematic review and meta-analysis studies (-).

ID	DOI	Authors	Year	Country	Region	Ecosystem	Sample	Aim
1	10.1016/j.heliyon.2024.e28851	Morais et al.	2024	multiple	Latin America	-	-	Review
2	10.1007/s11356-023-27029-7	Malli et al.	2023	multiple	Africa, Asia	-	-	Review
3	10.1080/03067319.2021.1887161	Enyoh et al.	2023	Nigeria	Africa	-	-	Review
4	10.1016/j.ocecoaman.2018.09.013	Castro et al.	2018	Brazil	Latin America	-	-	Review
5	10.1016/j.envpol.2020.115463	Kutralam-Muniasamy et al.	2020	multiple	Latin America	-	-	Review
6	10.1016/j.jenvman.2020.111557	Pandey et al.	2021	India	Asia	-	-	Review
7	NA	Rani-Borges et al.	2021	Brazil	Latin America	-	-	Review
8	10.3389/fenvs.2022.831417	Gela & Aragaw	2022	Ethiopia	Africa	4	W, S	Descriptive
9	10.46488/NEPT.2023.v22i04.004	Upadhyay & Bajpai	2023	India	Asia	4	W	Descriptive
10	10.3390/w12071994	Moruzzi et al.	2020	Brazil	Latin America	4	W	Descriptive
11	10.1016/j.scitotenv.2021.146421	Shaikh & Shaikh	2021	India	Asia	-	-	Review
12	10.1016/j.envadv.2021.100107	Mvovo	2021	multiple	Africa	-	-	Review
13	10.3390/foods10092013	Uzomah et al.	2021	Nigeria	Africa	-	-	Review
14	10.1016/j.scitotenv.2024.174092	Yakubu et al.	2024	multiple	Africa	-	-	Review
15	10.1016/j.scitotenv.2023.162452	Kelleher et al.	2023	Botswana	Africa	1, 2	S	Descriptive
16	10.1007/s13762-022-04489-x	Mishra et al.	2023	India	Asia	-	-	Review
17	10.3390/w14111737	Kumar et al.	2022	multiple	Asia	-	-	Review
18	10.1016/j.scitotenv.2018.11.054	Shruti et al.	2019	Mexico	Latin America	1, 3	S	Analytical
19	10.3389/fenvs.2022.878152	De Faria et al.	2022	Brazil	Latin America	1, 2, 6, 7	W	Analytical
20	10.1007/s11356-023-25135-0	Cardozo et al.	2023	Brazil	Latin America	1, 2	B	Analytical
21	10.1007/s11270-020-04964-6	Lima et al.	2021	Brazil	Latin America	1, 3	B	Descriptive
22	10.3389/fenvs.2022.1017480	Camargo et al.	2022	Brazil	Latin America	1	S	Analytical
23	10.3389/fenvs.2023.1028970	López et al.	2023	Ecuador	Latin America	7	W	Analytical
24	10.1016/j.jconhyd.2023.104284	Sadia et al.	2024	multiple	Asia	-	-	Review
25	10.1016/j.heliyon.2023.e14587	Mercy et al.	2023	Bangladesh	Asia	2	B, W, S	Descriptive
26	10.1007/s13762-024-05543-6	Truong et al.	2024	Vietnam	Asia	3	W	Descriptive
27	10.1016/j.ecoenv.2020.110656	Onia et al.	2020	Nigeria	Africa	2	W, S	Descriptive

Table S1. Continuation.

28	10.1016/j.ecoleng.2024.107334	Cabañas-Mendoza et al.	2024	Mexico	Latin America	4	B, W, S	Analytical
29	10.1007/s11356-020-09031-5	Adeogun et al.	2020	Nigeria	Africa	2	B	Analytical
30	10.1016/j.marpolbul.2023.115433	Anagha et al.	2023	India	Asia	2	W	Analytical
31	10.1016/j.scitotenv.2020.140527	Merga et al.	2020	Ethiopia	Africa	2	B, S	Descriptive
32	10.15625/2615-9783/18595	Mai et al.	2023	Vietnam	Asia	2	W	Descriptive
33	10.1016/j.envpol.2022.120890	Jessieleena & Nambi	2023	India	Asia	2	W, S	Descriptive
34	10.7717/peerj.14112	Loayza E. et al.	2022	Bolivia-Peru	Latin America	2	B, W	Analytical
35	10.1016/j.chemosphere.2022.133979	Jeevanandam et al.	2022	Ethiopia	Africa	2	S	Descriptive
36	dx.doi.org/10.12944/CWE.16.1.12	Manzoor et al.	2021	India	Asia	7	W	Descriptive
37	10.1016/j.scitotenv.2020.143503	Bertoldi et al.	2021	Brazil	Latin America	2	W	Analytical
38	10.1016/j.jglr.2015.10.012	Biginagwa et al.	2016	Tanzania	Africa	2	B	Descriptive
39	10.3390/w15020344	Rojas-Luna et al.	2023	Colombia	Latin America	2	W	Analytical
40	10.1016/j.jece.2024.112234	Queiroz et al.	2024	Brazil	Latin America	3	S	Descriptive
41	10.3897/aiep.53.102643	Angulo-Olmos et al.	2023	Mexico	Latin America	2	B	Descriptive
42	https://doi.org/10.1007/s11270-023-06617-w	Ditlhakanyane	2023	Botswana	Africa	3	B, W	Analytical
43	10.1016/j.scitotenv.2023.165146	Laju et al.	2023	India	Asia	2	W, S	Analytical
44	10.1007/s11270-024-06911-1	Yofukuji et al.	2024	Brazil	Latin America	3	B	Analytical
45	10.1016/j.scitotenv.2022.158671	Silva-Cavalcanti et al.	2023	Brazil	Latin America	2	S	Analytical
46	10.1016/j.scitotenv.2020.140201	Egessa et al.	2020	Uganda	Africa	2	W	Analytical
47	10.1007/s11356-024-33960-0	Gerolin et al.	2024	Brazil	Latin America	3	W, S	Analytical
48	10.1016/j.chemosphere.2020.128968	Martinez-Tavera et al.	2021	Mexico	Latin America	3	B	Analytical
49	10.1016/j.chemosphere.2020.128502	Bharath et al.	2021	India	Asia	2	W, S	Descriptive
50	10.1007/s00128-023-03839-w	Anandhan et al.	2024	India	Asia	2	B	Descriptive
51	10.4136/ambi-agua.2754	Oliva-Hernández et al.	2021	Guatemala	Latin America	2	B	Descriptive
52	10.1016/j.heliyon.2024.e29041	Boateng et al.	2024	Ghana	Africa	3	B, S	Analytical
53	10.3390/d15070821	Miranda-Peña et al.	2023	Colombia	Latin America	2	B, W	Analytical
54	10.1016/j.scitotenv.2022.157066	Nguyen et al.	2022	Vietnam	Asia	8	S	Descriptive
55	10.1002/etc.4677	Migwi et al.	2020	Kenya	Africa	2	W	Analytical
56	10.1016/j.envpol.2019.113442	Egessa et al.	2020	Uganda	Africa	2	S	Analytical
57	10.1016/j.scitotenv.2019.135021	Picó et al.	2020	Saudi Arabia	Asia	2	W	Descriptive
58	10.1007/s11356-020-09622-2	Gopinath et al.	2020	India	Asia	2	W, S	Descriptive
59	10.1007/s10661-023-12188-4	Upadhyay & Bajpai	2024	India	Asia	2	W	Analytical
60	10.1016/j.scitotenv.2022.153337	Laju et al.	2022	India	Asia	2	W, S	Analytical

Table S1. Continuation.

61	10.1016/j.chemosphere.2022.134556	Warrier et al.	2022	India	Asia	2	W	Analytical
62	10.1016/j.marpolbul.2023.114736	Costa et al.	2023	Brazil	Latin America	2	B	Descriptive
63	10.1016/j.enmm.2024.100962	Oyege et al.	2024	multiple	Africa	-	-	Review
64	10.1016/j.envres.2024.118543	Islam et al.	2024	Bangladesh	Asia	2	W, S	Analytical
65	10.1007/s11270-023-06168-0	Bandara	2023	Sri Lanka	Asia	2, 4	W	Analytical
66	10.1093/icesjms/fsab268	Silburn et al.	2023	Belize	Latin America	1	B, S	Analytical
67	10.1016/j.scitotenv.2023.166425	Das et al.	2023	India	Asia	-	-	Review
68	10.1016/j.envres.2023.115717	Anuar et al.	2023	Malaysia	Asia	1	W	Analytical
69	10.1016/j.scitotenv.2021.146788	Mora et al.	2021	Mexico	Latin America	-	-	Review
70	10.1016/j.scitotenv.2023.164027	Farooq et al.	2023	India	Asia	1	W	Analytical
71	NA	Hossain et al.	2022	Bangladesh	Asia	1	W, S	Descriptive
72	10.1016/j.chemosphere.2020.127234	Ta & Babel	2020	Thailand	Asia	1	W, S	Descriptive
73	10.1016/j.scitotenv.2023.162866	Islam et al.	2023	Bangladesh	Asia	1	S	Analytical
74	10.1016/j.scitotenv.2023.163876	Khan et al.	2023	India	Asia	1	B, S	Analytical
75	10.1007/s00244-021-00897-1	Kundu et al.	2022	Tanzania	Africa	1	W, S	Descriptive
76	10.4314/jasem.v27i6.8	Aliyu et al.	2023	Nigeria	Africa	1	W	Descriptive
77	10.1016/j.scitotenv.2022.159344	Haque et al.	2023	Bangladesh	Asia	1	B, W, S	Analytical
78	10.1007/s11356-022-24437-z	Amrutha et al.	2022	India	Asia	1	S	Analytical
79	10.1016/j.chemosphere.2022.134268	Maheswaran et al.	2022	India	Asia	1	S	Descriptive
80	10.3390/w13121648	Lechthaler et al.	2021	India	Asia	1	W	Descriptive
81	10.1016/j.marpolbul.2020.111960	Singh et al.	2021	India	Asia	1	W, S	Descriptive
82	10.1080/02757540.2023.2178648	Kumar et al.	2023	India	Asia	1	W	Descriptive
83	10.1016/j.envpol.2020.115241	Ribeiro-Brasil et al.	2020	Brazil	Latin America	6	B	Descriptive
84	10.1038/s41545-020-0050-1	Ram & Kumar	2020	India	Asia	1	S	Analytical
85	10.1016/j.marpolbul.2023.115088	Amrutha et al.	2023	India	Asia	1	W	Analytical
86	10.1007/s11356-023-29013-7	Costa et al.	2023	Brazil	Latin America	1	B	Analytical
87	10.1016/j.envpol.2018.10.088	Andrade et al.	2019	Brazil	Latin America	1	B	Analytical
88	10.1016/j.limno.2019.125708	Akindele et al.	2019	Nigeria	Africa	1	B	Descriptive
89	10.1071/MF22109	Costa et al.	2022	Brazil	Latin America	1	W	Analytical
90	https://doi.org/10.1590/S2179-975X3020	Santos et al.	2020	Brazil	Latin America	1	B	Descriptive
91	10.1016/j.scitotenv.2023.163199	Trindade et al.	2023	Brazil	Latin America	1	B	Descriptive
92	10.1590/1676-0611-BN-2020-1005	Urbanski et al.	2020	Brazil	Latin America	1	B	Descriptive

Table S1. Continuation.

93	10.4136/ambi-agua.2551	Oliveira et al.	2020	Brazil	Latin America	1	B	Descriptive
94	10.1007/s11356-020-08763-8	Akindele et al.	2020	Nigeria	Africa	1	B	Descriptive
95	10.3389/fenvs.2023.1068550	Oliveira et al.	2023	Brazil	Latin America	1	W	Analytical
96	10.3390/w12041210	Silva & Nanny	2020	Colombia	Latin America	1	W, S	Analytical
97	10.1016/j.envpol.2024.123529	Mukhopadhyay & Valsalan	2024	India	Asia	1	B	Descriptive
98	10.1007/s11270-020-04802-9	Garcia et al.	2020	Brazil	Latin America	6	B	Analytical
99	10.1007/s10668-021-01388-y	Chauhan et al.	2021	India	Asia	1	W, S	Descriptive
100	10.2166/ws.2022.408	Vaid et al.	2022	India	Asia	1	W	Descriptive
101	10.1016/j.watres.2023.119707	Rico et al.	2023	Brazil	Latin America	1, 6	W	Analytical
102	10.1590/S1413-415220220234	Souza et al.	2023	Brazil	Latin America	6	W	Analytical
103	10.5620/eaht.e2019012	Ebere et al.	2019	Nigeria	Africa	1	W	Descriptive
104	10.1016/j.envpol.2018.02.005	Lahens et al.	2018	Vietnam	Asia	1, 4	W	Analytical
105	10.1007/s10708-020-10273-6	Adu-Boahen et al.	2022	Ghana	Africa	1	B, W	Analytical
106	10.1016/j.chemosphere.2022.135563	Kumkar et al.	2022	India	Asia	1	S	Analytical
107	10.3390/w12113115	Ferraz et al.	2020	Brazil	Latin America	1	W	Analytical
108	10.1007/s10661-022-10856-5	Chen et al.	2023	Malaysia	Asia	1	W, S	Descriptive
109	10.1007/s10661-023-11019-w	Guimarães et al.	2023	Brazil	Latin America	1	B	Analytical
110	10.1007/s11270-022-05968-0	Verma et al.	2022	India	Asia	1	S	Analytical
111	NA	Krishnan & Jacob	2023	India	Asia	1	B	Descriptive
112	10.5007/2175-7925.2021.e81780	Ferrari & Hepp	2021	Brazil	Latin America	1	B	Descriptive
113	10.32526/ennrj/20/202100164	Khan & Setu	2022	Bangladesh	Asia	1	B	Analytical
114	10.1007/s10661-022-10263-w	Ditlhakanyane et al.	2022	Botswana	Africa	1	B, W	Analytical
115	10.1007/s11356-023-31118-y	Ololade et al.	2024	Nigeria	Africa	1	W, S	Descriptive
116	10.1007/s00128-024-03901-1	Ta et al.	2024	Indonesia, Thailand, Vietnam	Asia	1	W, S	Descriptive
117	10.1007/s10661-024-12587-1	Kalangutkar et al.	2024	India	Asia	1	W	Analytical
118	10.1016/j.scitotenv.2023.165405	Ta & Babel	2023	Thailand	Asia	1	W	Analytical
119	10.1016/j.marpolbul.2023.115525	Santos et al.	2023	Brazil	Latin America	1	W	Analytical
120	10.1016/j.scitotenv.2022.160934	Costa et al.	2023	Brazil	Latin America	1	B	Analytical
121	10.1016/j.marpolbul.2021.113067	Capparelli et al.	2021	Ecuador	Latin America	1	W	Analytical
122	10.1016/j.scitotenv.2020.141604	Gerolin et al.	2020	Brazil	Latin America	1	S	Analytical
123	10.1016/j.marpolbul.2023.115075	Diez-Pérez et al.	2023	Paraguay	Latin America	1	W	Descriptive
124	10.1016/j.envadv.2023.100350	Neelavannan et al.	2023	India	Asia	1	W, S	Analytical

Table S1. Continuation.

125	10.1007/s13762-024-05609-5	PiñonColin et al.	2024	Mexico	Latin America	1	S	Descriptive
126	10.1007/s00128-022-03588-2	S et al.	2022	India	Asia	1	S	Descriptive
127	10.1016/j.heliyon.2020.e04302	Donoso & Rios-Touma	2020	Ecuador	Latin America	1	W, S	Analytical
128	10.1016/j.chemosphere.2023.139493	Costa et al.	2023	Brazil	Latin America	1	W	Analytical
129	10.1016/j.envpol.2016.11.068	Silva-Cavalcanti et al.	2017	Brazil	Latin America	1	B	Analytical
130	10.21660/2020.67.9110	Kasamesiri & Thaimuangphol	2020	Thailand	Asia	1	B	Descriptive
131	10.30852/sb.2022.1741	Babel et al.	2022	Indonesia, Thailand, Vietnam	Asia	1	W	Analytical
132	10.1007/s11356-022-24998-z	Fatema et al.	2022	Bangladesh	Asia	1	W, S	Descriptive
133	10.1371/journal.pone.0263196	Blankson et al.	2022	Ghana	Africa	1	B, W, S	Descriptive
134	10.1016/j.marpolbul.2015.08.041	Phillips & Bonner	2015	Mexico	Latin America	6	B	Analytical
135	10.1016/j.marpolbul.2023.114919	Ta & Babel	2023	Thailand	Asia	1	W, S	Analytical
136	10.7717/peerj.14861	Jitkaew et al.	2023	Thailand	Asia	1	B	Analytical
137	10.1007/s11270-022-05976-0	Shukla et al.	2022	India	Asia	1	B	Analytical
138	10.1007/s00128-022-03595-3	Anandhan et al.	2022	India	Asia	1	B	Analytical
139	10.1134/S1995082924020044	Chesnokova et al.	2024	Vietnam	Asia	1	B	Descriptive
140	10.1016/j.chemosphere.2022.135945	Islam et al.	2022	Bangladesh	Asia	1	W, S	Analytical
141	10.1088/1748-9326/ac2198	Haberstroh et al.	2021	Cambodia	Asia	1	W	Analytical
142	10.1007/s00128-021-03138-2	Lucas-Solis et al.	2021	Ecuador	Latin America	1	S	Descriptive
143	10.1016/j.hazadv.2024.100409	Idowu et al.	2024	Nigeria	Africa	1	B, W, S	Descriptive
144	10.1016/j.envpol.2021.117895	Chen et al.	2021	Malaysia	Asia	1	W	Analytical
145	10.1016/j.scitotenv.2019.133712	Sarkar et al.	2019	India	Asia	1	S	Analytical
146	10.1016/j.envpol.2020.116348	Napper et al.	2021	Bangladesh, India	Asia	1	W	Analytical
147	10.1016/j.envres.2022.112972	Chen et al.	2022	Malaysia	Asia	1	W	Analytical
148	10.1007/s11160-022-09740-9	Sun et al.	2023	Cambodia, Laos, Myanmar, Thailand, Vietnam	Asia	-	-	Review
149	10.1007/s11356-023-30241-0	Bertoldi et al.	2023	Brazil	Latin America	1	W	Analytical
150	10.1021/acsestwater.3c00649	Brooks et al.	2024	Cambodia	Asia	1	W	Modeling
151	10.1016/j.scitotenv.2020.140377	Amrutha & Warriar	2020	India	Asia	1	W, S	Analytical
152	10.1016/j.heliyon.2023.e23393	Saad & Alamin	2024	Sudan	Africa	1	B	Descriptive
153	10.1007/s11356-023-26512-5	Sultana et al.	2023	Bangladesh	Asia	1	B	Descriptive

Table S1. Continuation.

154	10.1016/j.envpol.2023.122141	Kumari et al.	2023	India	Asia	1	B	Analytical
155	10.1007/s11356-020-11605-2	Garcia et al.	2020	Colombia	Latin America	9	B	Descriptive
156	10.3390/su15086813	Sin et al.	2023	multiple	Asia	-	-	Review
157	10.1016/j.scitotenv.2022.156858	Roman et al.	2022	multiple	Asia	-	-	Review
158	10.1016/j.scitotenv.2021.147137	Parvin et al.	2021	Bangladesh	Asia	9	B	Descriptive
159	10.1016/j.envres.2022.115011	Pandey et al.	2023	India	Asia	9	B	Analytical
160	10.1016/j.ecolind.2023.111334	Siddique et al.	2024	Bangladesh	Asia	9	B	Analytical
161	10.1016/j.envpol.2023.121961	Kutralam-Muniasamy et al.	2023	Mexico	Latin America	9	B	Descriptive
162	10.1002/etc.5707	Githaiga et al.	2023	Kenya	Africa	-	-	Review
163	10.1016/j.scitotenv.2023.167426	Aguilar-Aguilar et al.	2023	Mexico	Latin America	-	-	Review
164	10.1016/j.gsd.2021.100705	Amuah et al.	2022	Ghana	Africa	-	-	Review
165	10.1016/j.heliyon.2023.e15066	Filho et al.	2023	Brazil	Latin America	9	B	Analytical
166	10.1016/j.chemosphere.2023.139813	Sodré et al.	2023	Brazil	Latin America	-	B, S, W	Analytical
167	10.1590/1809-4392202201212	Rojas et al.	2023	Peru	Latin America	9	B	Analytical
168	10.1108/MEQ-06-2023-0170	Asori et al.	2024	multiple	Africa	-	-	Review
169	10.1007/s42452-021-04619-z	Aragaw	2021	multiple	Africa	-	-	Review
170	10.1016/j.envpol.2022.119697	Islam et al.	2022	Bangladesh	Asia	-	-	Review
171	10.1007/s11356-021-15826-x	Chen et al.	2021	multiple	Asia	-	-	Review
172	10.1007/s11356-021-16827-6	Vaid et al.	2021	India	Asia	-	-	Review
173	10.1016/j.envres.2024.118307	Nyaga et al.	2024	multiple	Africa	-	-	Meta-analysis
174	10.55373/mjchem.v25i3.120	Razak et al.	2022	multiple	Asia	-	-	Review
175	10.1016/j.envadv.2022.100236	Grillo et al.	2022	multiple	Latin America	-	-	Review
176	10.1016/j.scitotenv.2019.03.472	Ramirez et al.	2019	Mexico	Latin America	4	S	Analytical
177	10.1002/etc.5350	Onia & Sanni	2022	Nigeria	Africa	5	W, S	Descriptive
178	10.1016/j.watres.2021.116853	Sarkar et al.	2021	India	Asia	7	W, S	Analytical
179	10.1016/j.scitotenv.2022.158303	Shehu et al.	2022	multiple	Africa	-	-	Review
180	10.1016/j.heliyon.2022.e11562	Okeke et al.	2022	multiple	Africa	-	-	Review
181	10.1016/j.envpol.2022.120714	Angnunavuri et al.	2023	multiple	Africa	-	-	Review
182	10.1016/j.scitotenv.2020.143285	Chowdhury et al.	2021	Bangladesh	Asia	-	-	Review
183	10.1007/s11356-020-11736-6	Akindele & Alimba	2021	multiple	Africa	-	-	Review
184	10.1016/j.envpol.2022.120615	Daudt et al.	2023	Brazil	Latin America	-	-	Review
185	10.1016/j.scitotenv.2021.150671	Masiá et al.	2022	multiple	Africa	-	-	Meta-analysis

Table S1. Continuation.

186	10.1016/j.chemosphere.2021.130263	Bharath et al.	2021	India	Asia	5	W	Descriptive
187	10.1016/j.jenvman.2023.119224	Priya et al.	2023	India	Asia	5	W	Descriptive
188	10.1080/10807039.2022.2154635	Srihari et al.	2023	India	Asia	1, 2, 5	W	Analytical
189	10.1007/s10040-022-02582-6	Patterson et al.	2023	India	Asia	5	W	Analytical
190	10.1016/j.jenvman.2024.120361	Pavithra et al.	2024	India	Asia	1, 5	W	Analytical