Supporting Information

Source contribution analysis and collaborative assessment of heavy metals in vegetable-growing soils

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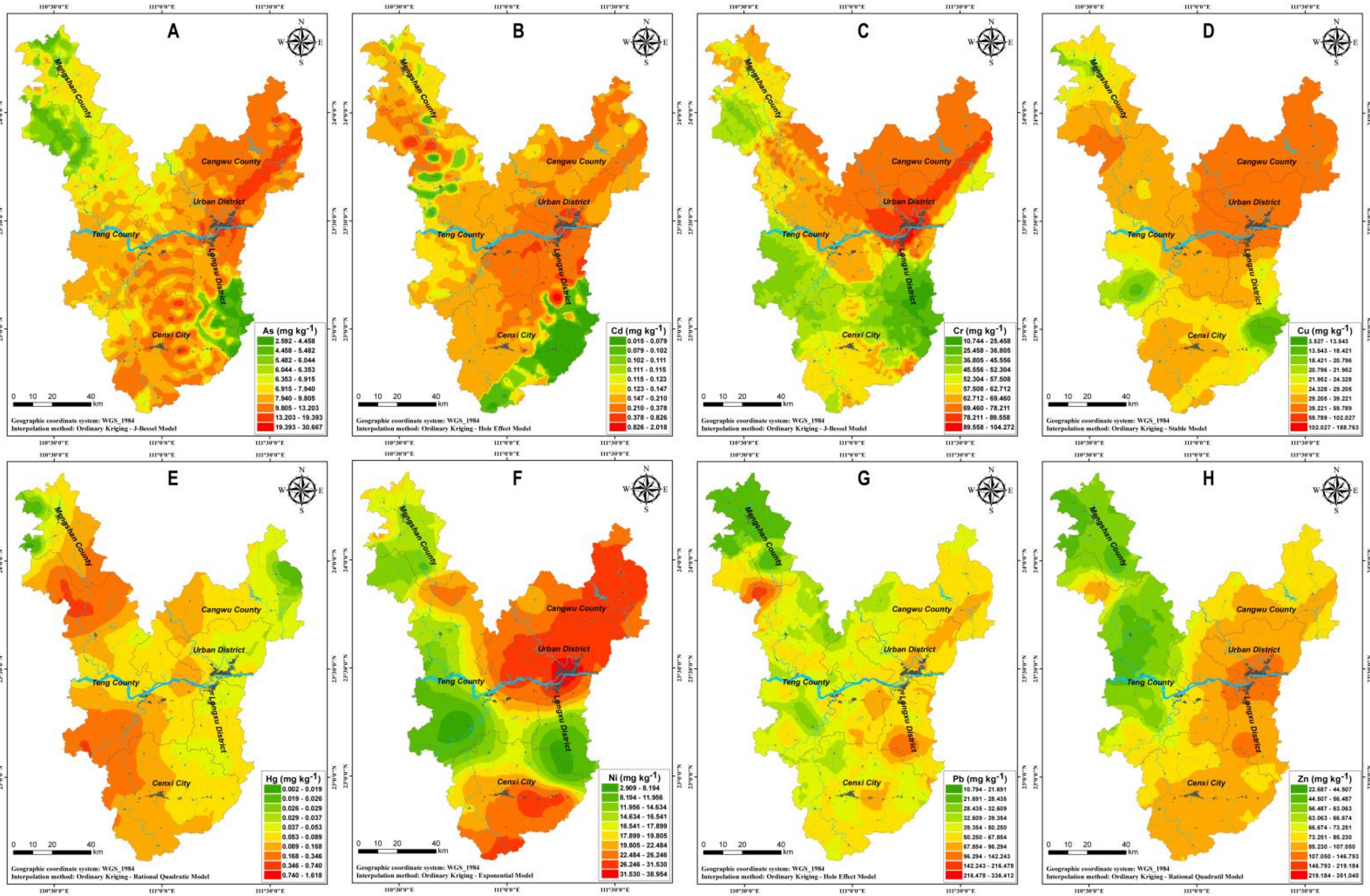

Figure S1. Predicted spatial distribution maps of concentrations of As (A), Cd (B), Cr (C), Cu (D), Hg (E), Ni (F), Pb (G), and Zn (H).

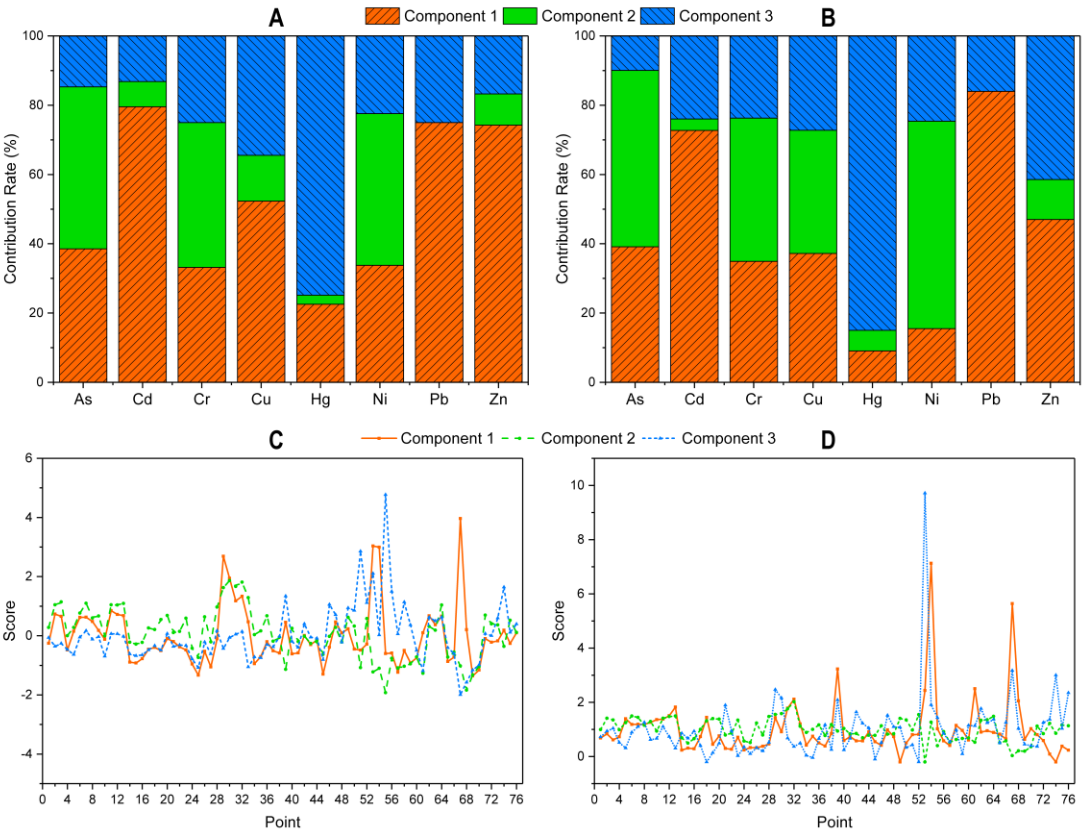

Figure S2. The comparison of two source identification methods: Principal Component Analysis (A and C) and Positive Matrix Factorization (B and D).

Table S1. The parameters and prediction errors of different interpolation models for heavy metals.

Heavy metal	Optimized Interpolation Model [a]				Prediction Errors				
	Type	Nugget (Paremeter)	Major Range	Partial Sill	Mean	R-M-S [b]	Mean Standardized	R-M-S Standardized	Average Standard Error
As	Circular	0.063	0.037	0.160	0.258	3.914	0.036	0.949	4.258
	Spherical	0.067	0.047	0.146	0.215	3.935	0.030	0.967	4.146
	Tetraspherical	0.065	0.047	0.141	0.202	3.943	0.029	0.979	4.092
	Pentaspherical	0.067	0.070	0.171	0.266	3.929	0.033	0.938	4.335
	Exponential	0.059	0.070	0.178	0.264	3.943	0.031	0.955	4.290
	Gaussian	0.078	0.037	0.151	0.245	3.948	0.031	0.947	4.335
	Rational Quadratic	0.071	0.070	0.163	0.245	3.959	0.025	0.965	4.300
	Hole Effect	0.083	0.070	0.147	0.231	3.847	0.042	0.901	4.331
	K-Bessel	0.041 (0.288)	0.070	0.181	0.236	3.943	0.030	0.967	4.153
	J-Bessel	**0.084 (0.010)**	**0.064**	**0.092**	**0.113**	**3.890**	**0.040**	**0.976**	**3.806**
	Stable	0 (0.358)	0.958	0.274	0.064	3.913	0.000	1.096	3.702
Cd	Circular	0.101	0.181	0.746	-0.006	0.239	-0.110	1.266	0.173
	Spherical	0.060	0.076	0.587	-0.006	0.239	-0.109	1.299	0.183
	Tetraspherical	0.048	0.080	0.687	-0.002	0.239	-0.097	1.254	0.205
	Pentaspherical	0.041	0.084	0.741	0.000	0.239	-0.093	1.243	0.218
	Exponential	0.071	0.203	0.722	-0.006	0.239	-0.092	1.259	0.176
	Gaussian	0.159	0.189	0.690	-0.008	0.237	-0.099	1.230	0.168
	Rational Quadratic	0.083	0.116	0.680	0.000	0.238	-0.089	1.262	0.204
	Hole Effect	**0.095**	**0.080**	**0.614**	**0.001**	**0.225**	**-0.075**	**1.163**	**0.213**
	K-Bessel	0.068 (0.507)	0.190	0.741	-0.005	0.240	-0.092	1.254	0.181
	J-Bessel	0.096 (2.852)	0.080	0.610	0.001	0.235	-0.092	1.264	0.208
	Stable	0.097 (1.589)	0.080	0.537	-0.006	0.239	-0.106	1.297	0.178
Cr	Circular	0.001	0.004	0.073	1.138	12.744	0.060	0.874	16.397
	Spherical	0.001	0.004	0.082	1.311	12.778	0.065	0.831	17.367
	Tetraspherical	0.000	0.005	0.087	1.406	12.798	0.068	0.810	17.914
	Pentaspherical	0	0.005	0.084	1.321	12.816	0.066	0.823	17.598
	Exponential	0	0.008	0.095	1.546	12.911	0.069	0.796	18.469
	Gaussian	0.003	0.003	0.094	1.657	12.723	0.072	0.794	18.549
	Rational Quadratic	0.002	0.008	0.103	1.795	12.819	0.074	0.773	19.217
	Hole Effect	0.007	0.007	0.104	2.025	12.651	0.086	0.752	19.961
	K-Bessel	0 (0.157)	0.344	0.194	1.057	12.678	0.047	0.716	20.427
	J-Bessel	**0.003 (0.01)**	**0.004**	**0.052**	**0.856**	**12.676**	**0.046**	**1.008**	**13.927**
	Stable	0.000 (1.636)	0.003	0.088	1.535	12.685	0.072	0.910	17.743
Cu	Circular	0.148	0.219	0.259	0.371	21.591	-0.034	1.176	19.287
	Spherical	0.141	0.219	0.260	0.447	21.634	-0.033	1.173	19.367
	Tetraspherical	0.157	0.307	0.241	0.176	21.632	-0.030	1.193	18.988
	Pentaspherical	0.161	0.344	0.236	0.071	21.615	-0.034	1.197	18.909
	Exponential	0.173	0.424	0.223	0.021	21.616	-0.019	1.158	19.095
	Gaussian	0.178	0.219	0.232	0.323	21.353	-0.026	1.143	19.647
	Rational Quadratic	0.180	0.424	0.212	0.037	21.420	-0.020	1.152	19.116
	Hole Effect	0.181	0.219	0.196	0.781	21.382	-0.005	1.058	21.042
	K-Bessel	0 (0.085)	0.869	0.425	-0.041	21.786	-0.011	1.136	18.658
	J-Bessel	0.173 (10.000)	0.299	0.219	0.198	21.363	-0.026	1.156	19.476
	Stable	**0 (0.341)**	**1.208**	**0.428**	**-0.070**	**21.881**	**-0.020**	**1.146**	**18.143**
Hg	Circular	0.898	0.513	0.852	0.004	0.220	0.039	0.754	0.300
	Spherical	1.029	0.755	0.815	0.006	0.220	0.065	0.648	0.317
	Tetraspherical	0.996	0.793	0.825	0.006	0.220	0.060	0.668	0.314
	Pentaspherical	1.012	0.869	0.786	0.006	0.220	0.064	0.659	0.316

	Exponential	0.972	0.972	0.857	0.007	0.219	0.061	0.658	0.324
	Gaussian	1.119	0.620	0.731	0.006	0.222	0.062	0.666	0.312
	Rational Quadratic	**0.736**	**0.407**	**1.006**	**0.012**	**0.222**	**-0.012**	**0.979**	**0.342**
	Hole Effect	1.169	0.881	0.553	0.007	0.222	0.073	0.647	0.320
	K-Bessel	0 (0.815)	1.217	1.892	0.007	0.214	0.057	0.687	0.338
	J-Bessel	1.118 (10.000)	0.952	0.652	0.005	0.222	0.063	0.668	0.311
	Stable	0 (0.385)	0.272	1.607	0.010	0.214	0.034	0.679	0.403
	Circular	0.073	0.334	0.242	0.101	4.509	0.036	0.707	7.512
	Spherical	0.070	0.353	0.239	0.067	4.506	0.033	0.707	7.476
	Tetraspherical	0.068	0.366	0.238	0.058	4.517	0.032	0.708	7.465
	Pentaspherical	0.065	0.366	0.237	0.047	4.536	0.031	0.709	7.463
	Exponential	**0.052**	**0.363**	**0.260**	**0.008**	**4.621**	**0.025**	**0.732**	**7.311**
Ni	Gaussian	0.086	0.238	0.198	0.126	4.657	0.033	0.703	7.808
	Rational Quadratic	0.074	0.366	0.230	0.071	4.713	0.031	0.705	7.757
	Hole Effect	0.099	0.382	0.189	0.249	4.698	0.046	0.660	8.240
	K-Bessel	0.085 (1.452)	0.374	0.227	0.099	4.645	0.038	0.700	7.700
	J-Bessel	0.086 (4.511)	0.356	0.211	0.075	4.650	0.029	0.704	7.748
	Stable	0.083 (1.518)	0.356	0.233	0.094	4.616	0.037	0.698	7.672
	Circular	0.143	0.116	0.186	-1.762	45.778	-0.097	1.499	33.509
	Spherical	0.124	0.190	0.368	-0.260	45.856	-0.098	1.558	36.549
	Tetraspherical	0.120	0.190	0.366	-0.161	45.875	-0.095	1.545	37.099
	Pentaspherical	0.118	0.203	0.367	-0.099	45.860	-0.094	1.545	37.188
	Exponential	0.103	0.116	0.235	-1.780	46.258	-0.109	1.532	33.341
Pb	Gaussian	0.163	0.189	0.341	-0.434	45.141	-0.085	1.511	36.001
	Rational Quadratic	0.137	0.227	0.361	0.294	46.097	-0.084	1.543	38.268
	Hole Effect	**0.202**	**0.190**	**0.255**	**0.409**	**44.998**	**-0.033**	**1.254**	**41.970**
	K-Bessel	0 (0.173)	0.116	0.341	-2.038	46.455	-0.107	1.477	32.623
	J-Bessel	0.160 (6.900)	0.227	0.322	0.123	45.248	-0.075	1.482	37.648
	Stable	0.176 (1.740)	0.303	0.335	-1.294	46.402	-0.086	1.519	33.615
	Circular	0.130	0.116	0.085	1.257	43.718	-0.012	1.074	41.855
	Spherical	0.139	0.219	0.084	1.150	43.564	-0.007	1.094	41.316
	Tetraspherical	0.137	0.219	0.086	1.231	43.340	-0.003	1.082	41.380
	Pentaspherical	0.134	0.219	0.087	1.304	43.207	-0.001	1.074	41.440
	Exponential	0.126	0.219	0.101	1.378	43.397	-0.004	1.091	41.155
Zn	Gaussian	0.141	0.116	0.072	1.241	43.753	-0.011	1.071	42.201
	Rational Quadratic	**0.142**	**0.301**	**0.085**	**0.527**	**43.165**	**-0.017**	**1.098**	**40.832**
	Hole Effect	0.154	0.219	0.062	1.758	42.722	0.020	1.003	43.132
	K-Bessel	0 (0.083)	0.938	0.270	-0.168	43.457	-0.039	1.187	36.626
	J-Bessel	0.143 (10.000)	0.219	0.076	1.462	42.851	0.007	1.046	42.002
	Stable	0 (0.327)	0.739	0.253	-0.199	43.442	-0.041	1.163	36.505

[a] Interpolation Method: Ordinary Kriging. Variable: Semivariogram.

[b] R-M-S = Root-Mean-Square.

Table S2. The parameters and prediction errors of different interpolation models for scores of principal components.

Principal component	Optimized Interpolation Model [a]				Prediction Errors				
	Type	Nugget (Paremeter)	Major Range	Partial Sill	Mean	R-M-S [b]	Mean Standardized	R-M-S Standardized	Average Standard Error
Principal component 1	Circular	0.442	0.167	0.551	0.035	0.793	0.034	0.926	0.861
	Spherical	0.440	0.190	0.537	0.033	0.790	0.032	0.928	0.857
	Tetraspherical	0.436	0.203	0.527	0.036	0.786	0.035	0.924	0.855
	Pentaspherical	0.425	0.203	0.533	0.039	0.785	0.037	0.922	0.855
	Exponential	0.410	0.290	0.639	0.023	0.789	0.019	0.935	0.846
	Gaussian	0.491	0.164	0.509	0.032	0.788	0.032	0.921	0.866
	Rational Quadratic	0.479	0.341	0.554	0.013	0.785	0.010	0.924	0.856
	Hole Effect	0.521	0.203	0.405	0.047	0.781	0.047	0.885	0.887
	K-Bessel	0 (0.112)	0.374	1.051	0.023	0.781	0.015	0.927	0.817
	J-Bessel	**0.076 (0.01)**	**0.012**	**0.580**	**0.071**	**0.766**	**0.079**	**1.014**	**0.729**
	Stable	0 (0.358)	0.972	1.119	0.023	0.781	0.014	0.934	0.802
Principal component 2	Circular	0.158	0.305	1.119	0.015	0.632	0.012	1.051	0.626
	Spherical	0.145	0.320	1.089	0.013	0.634	0.009	1.067	0.624
	Tetraspherical	0.160	0.356	1.007	0.014	0.637	0.010	1.045	0.632
	Pentaspherical	**0.189**	**0.404**	**0.925**	**0.015**	**0.639**	**0.012**	**1.007**	**0.648**
	Exponential	0.173	0.415	0.971	0.014	0.649	0.009	0.986	0.669
	Gaussian	0.233	0.294	1.104	0.014	0.632	0.013	1.031	0.635
	Rational Quadratic	0.251	0.488	0.859	0.014	0.644	0.011	0.978	0.675
	Hole Effect	0.199	0.356	0.896	0.018	0.633	0.019	1.096	0.609
	K-Bessel	0.215 (4.958)	0.294	1.097	0.011	0.633	0.007	1.045	0.635
	J-Bessel	0.248 (0.01)	0.468	0.796	0.009	0.638	0.010	1.064	0.613
	Stable	0.210 (1.849)	0.280	1.125	0.013	0.633	0.009	1.047	0.636
Principal component 3	Circular	0.146	0.039	0.984	-0.018	0.748	-0.007	0.857	0.879
	Spherical	0.138	0.041	0.927	-0.017	0.753	-0.007	0.871	0.862
	Tetraspherical	0.124	0.041	0.901	-0.016	0.757	-0.007	0.880	0.852
	Pentaspherical	0.155	0.047	0.766	-0.015	0.762	-0.006	0.908	0.823
	Exponential	0.241	0.151	0.787	-0.014	0.762	-0.006	0.930	0.810
	Gaussian	0.278	0.041	0.754	-0.011	0.761	-0.001	0.887	0.869
	Rational Quadratic	0.328	0.151	0.674	-0.012	0.767	-0.004	0.919	0.834
	Hole Effect	0.296	0.060	0.486	-0.014	0.764	-0.004	0.943	0.804
	K-Bessel	**0 (0.150)**	**0.516**	**1.185**	**-0.015**	**0.750**	**-0.008**	**0.933**	**0.770**
	J-Bessel	0.278 (0.01)	0.055	0.476	-0.021	0.760	-0.010	0.951	0.787
	Stable	0 (0.443)	0.713	1.191	-0.020	0.753	-0.013	0.924	0.775

[a] Interpolation Method: Ordinary Kriging. Variable: Semivariogram.

[b] R-M-S = Root-Mean-Square.

16 **Table S3**. The calculations of the parameter for collaborative assessment.

No.	Soil [a]					Agricultural product [b]		Hyper-standard [c],	Hyper-background [d],	Hyper-standard AP [e],	**IICQ** [f]
	pH	RIE	DDDB	DDSB	**$IICQ_s$**	QIAP	**$IICQ_{ap}$**	X	Y	Z	
1	5.47	0.596	0.888	13.273	**0.134**	0.415	**0.006**	0	2	0	**0.14**
2	6.36	0.735	1.112	13.273	**2.322**	0.423	**0.006**	1	7	0	**2.328**
3	5.73	0.716	1.088	13.273	**0.574**	0.530	**0.008**	0	7	0	**0.582**
4	6.38	0.568	0.878	13.273	**0.132**	0.411	**0.006**	0	2	0	**0.138**
5	5.31	0.677	1.011	13.273	**1.982**	0.381	**0.006**	1	4	0	**1.988**
6	4.63	0.725	1.074	13.273	**0.486**	0.408	**0.006**	0	6	0	**0.492**
7	4.13	0.709	1.053	13.273	**0.476**	0.459	**0.007**	0	6	0	**0.483**
8	4.67	0.710	1.057	13.273	**0.478**	0.452	**0.007**	0	6	0	**0.485**
9	4.90	0.655	0.978	13.273	**0.368**	0.455	**0.007**	0	5	0	**0.375**
10	5.50	0.619	0.950	13.273	**0.215**	0.408	**0.006**	0	3	0	**0.221**
11	5.26	0.751	1.115	13.273	**2.339**	0.363	**0.005**	1	7	0	**2.344**
12	5.33	0.732	1.090	13.273	**2.224**	0.494	**0.007**	1	6	0	**2.232**
13	5.28	0.728	1.079	13.273	**2.216**	0.386	**0.006**	1	6	0	**2.221**
14	5.46	0.507	0.751	13.273	**0**	0.508	**0.008**	0	0	0	**0.008**
15	7.65	0.632	0.749	13.273	**0**	0.335	**0.005**	0	0	0	**0.005**
16	7.60	0.650	0.792	13.273	**0**	0.342	**0.005**	0	0	0	**0.005**
17	5.56	0.558	0.854	13.273	**0.064**	0.272	**0.004**	0	1	0	**0.068**
18	7.49	0.607	0.910	13.273	**0.069**	0.354	**0.005**	0	1	0	**0.074**
19	5.95	0.522	0.790	13.273	**0.119**	0.343	**0.005**	0	2	0	**0.124**
20	5.13	0.631	0.943	13.273	**0.284**	0.659	**1.142**	0	4	1	**1.426**
21	6.21	0.602	0.923	13.273	**0.209**	0.339	**0.005**	0	3	0	**0.214**
22	5.55	0.569	0.868	13.273	**0.065**	0.332	**0.005**	0	1	0	**0.07**
23	7.46	0.556	0.806	13.273	**0.061**	0.256	**0.004**	0	1	0	**0.065**
24	7.36	0.501	0.718	13.273	**0**	0.612	**0.009**	0	0	0	**0.009**
25	6.98	0.435	0.614	13.273	**0**	0.251	**0.004**	0	0	0	**0.004**
26	5.76	0.532	0.799	13.273	**0**	0.506	**0.008**	0	0	0	**0.008**
27	5.25	0.468	0.684	13.273	**0**	0.561	**0.008**	0	0	0	**0.008**
28	6.03	0.604	0.936	13.273	**0.141**	0.397	**0.006**	0	2	0	**0.147**
29	6.20	0.938	1.396	13.273	**4.611**	0.520	**0.008**	2	7	0	**4.619**
30	6.30	0.854	1.287	13.273	**4.387**	0.386	**0.006**	2	7	0	**4.393**
31	4.57	0.781	1.166	13.273	**2.397**	0.391	**0.006**	1	7	0	**2.402**
32	4.47	0.796	1.184	13.273	**2.42**	0.377	**0.006**	1	7	0	**2.426**
33	6.11	0.666	1.001	13.273	**0.302**	0.411	**0.006**	0	4	0	**0.308**
34	5.32	0.487	0.714	13.273	**0**	0.481	**0.007**	0	0	0	**0.007**
35	5.62	0.514	0.772	13.273	**0.058**	0.400	**0.006**	0	1	0	**0.064**
36	5.87	0.589	0.884	13.273	**0.133**	0.483	**0.007**	0	2	0	**0.14**
37	4.94	0.601	0.922	13.273	**0.069**	0.376	**0.006**	0	1	0	**0.075**
38	5.23	0.595	0.919	13.273	**0.138**	0.395	**0.006**	0	2	0	**0.144**
39	5.27	0.772	1.246	13.273	**3.92**	0.508	**0.008**	2	4	0	**3.927**
40	4.30	0.549	0.826	13.273	**0.062**	0.545	**0.008**	0	1	0	**0.07**
41	5.26	0.581	0.889	13.273	**0.067**	0.272	**0.004**	0	1	0	**0.071**
42	5.35	0.678	1.060	13.273	**0.319**	0.399	**0.006**	0	4	0	**0.325**
43	4.95	0.645	0.998	13.273	**0.301**	0.322	**0.005**	0	4	0	**0.306**
44	4.71	0.655	1.016	13.273	**0.306**	0.360	**0.005**	0	4	0	**0.312**
45	5.76	0.433	0.684	13.273	**0**	0.313	**0.005**	0	0	0	**0.005**
46	5.73	0.618	1.030	13.273	**0.155**	0.434	**0.007**	0	2	0	**0.162**
47	4.94	0.756	1.166	13.273	**2.37**	0.571	**0.009**	1	7	0	**2.379**
48	5.33	0.712	1.086	13.273	**2.039**	0.569	**0.009**	1	4	0	**2.048**
49	5.73	0.686	1.118	13.273	**0.589**	0.341	**0.005**	0	7	0	**0.595**
50	4.32	0.604	0.970	13.273	**0.219**	0.479	**0.007**	0	3	0	**0.226**
51	4.51	0.715	1.218	13.273	**0.275**	0.505	**0.008**	0	3	0	**0.283**
52	4.97	0.616	0.980	13.273	**0.295**	0.404	**0.006**	0	4	0	**0.302**
53	5.35	1.076	1.666	13.273	**6.856**	0.849	**2.352**	3	5	2	**9.208**

54	5.04	1.071	1.641	13.273	**9.026**	0.362	**0.005**	4	6	0	**9.031**
55	5.88	0.694	1.293	13.273	**0.292**	0.490	**0.007**	0	3	0	**0.3**
56	5.64	0.619	1.064	13.273	**0.24**	0.418	**0.006**	0	3	0	**0.247**
57	5.96	0.485	0.833	13.273	**0.063**	0.226	**0.003**	0	1	0	**0.066**
58	4.61	0.660	1.101	13.273	**0.249**	0.302	**0.005**	0	3	0	**0.253**
59	5.01	0.581	0.955	13.273	**0.144**	0.315	**0.005**	0	2	0	**0.149**
60	4.47	0.560	0.885	13.273	**0.2**	0.453	**0.007**	0	3	0	**0.207**
61	5.53	0.650	1.041	13.273	**1.807**	0.352	**0.005**	1	2	0	**1.813**
62	6.49	0.743	1.177	13.273	**2.364**	0.478	**0.007**	1	7	0	**2.371**
63	6.08	0.710	1.130	13.273	**0.511**	0.417	**0.006**	0	6	0	**0.517**
64	5.82	0.704	1.100	13.273	**0.497**	0.443	**0.007**	0	6	0	**0.504**
65	4.56	0.551	0.872	13.273	**0.131**	0.422	**1.091**	0	2	1	**1.222**
66	6.69	0.553	0.852	13.273	**0.128**	0.312	**0.005**	0	2	0	**0.133**
67	6.99	1.115	1.629	13.273	**8.952**	0.591	**1.127**	4	4	1	**10.08**
68	5.29	0.727	1.063	13.273	**3.774**	1.034	**2.429**	2	4	2	**6.203**
69	4.42	0.417	0.637	13.273	**0.048**	0.406	**0.006**	0	1	0	**0.054**
70	4.90	0.449	0.701	13.273	**0.053**	0.376	**0.006**	0	1	0	**0.059**
71	5.92	0.578	0.933	13.273	**0.211**	0.391	**0.006**	0	3	0	**0.217**
72	5.85	0.568	0.906	13.273	**0.273**	0.344	**0.005**	0	4	0	**0.278**
73	5.71	0.603	0.976	13.273	**0.294**	0.508	**0.008**	0	4	0	**0.302**
74	5.64	0.677	1.140	13.273	**1.935**	0.394	**0.006**	1	3	0	**1.941**
75	6.20	0.573	0.888	13.273	**0.067**	0.381	**0.006**	0	1	0	**0.073**
76	7.57	0.730	1.048	13.273	**0.395**	0.778	**2.323**	0	5	2	**2.718**

[a] RIE = Relative impact equivalent; DDDB = Deviation degree of determination concentration from the background value; DDSB = Deviation degree of soil standard from the background value; $IICQ_s$ = Impact index of comprehensive quality for soil.

[b] QIAP = Quality index of agricultural products; $IICQ_{ap}$ = Impact index of comprehensive quality for agricultural products.

[c] National standard value of farmland environmental quality for As, Cd, Cr, Cu, Hg, Ni, Pb and Zn are 40, 0.3, 150, 50, 1.3, 60, 70, and 200 mg kg^{-1} (pH < 5.5), 40, 0.3, 150, 50, 1.8, 70, 90, and 200 mg kg^{-1} (5.5 < pH < 6.5), 30, 0.3, 200, 100, 2.4, 100, 120, and 250 mg kg^{-1} (6.5 < pH < 7.5), and 25, 0.6, 250, 100, 3.4, 190, 170, and 300 mg kg^{-1} (pH > 7.5), respectively. [1]

[d] Background value for As, Cd, Cr, Cu, Hg, Ni, Pb, and Zn are 10.82, 0.1853, 70.18, 23.78, 0.1291, 23.37, 29.95, and 72.61 mg kg^{-1}, respectively [2].

[e] AP = Agricultural products. National maximum levels of vegetables for As, Cd, Cr, Cu, Hg, Ni, Pb and Zn are 0.5, 0.05 (0.2 for leafy vegetable and 0.1 for root vegetable), 0.5, 10, 0.01, 0.6, 0.1 (0.3 for leafy vegetable and 0.2 for root vegetable), and 20 mg kg^{-1}, respectively [3].

[f] IICQ = Impact index of comprehensive quality.

Table S4. The prediction errors of different models of Empirical Bayesian Kriging interpolation for impact index of comprehensive quality (IICQ).

Interpolation Method		Prediction Errors				
Transformation	Semivariogram Type	Mean	R-M-S [a]	Mean Standardized	R-M-S Standardized	Average Standard Error
None	**Linear**	**0.019**	**1.757**	**0.000**	**0.972**	**1.813**
	Power	0.053	1.779	0.012	1.022	1.725
	Thin Plate Spline	-0.075	2.132	-0.039	0.958	2.282
Empirical	Exponential	-0.271	1.905	-0.201	1.387	1.383
	Exponential Detrended	0.052	1.828	0.001	0.946	1.943
	Whittle	-0.186	1.833	-0.083	1.087	1.489
	Whittle Detrended	-0.234	1.812	-0.220	1.568	1.252
	K-Bessel	-0.122	1.829	-0.049	1.123	1.511
	K-Bessel Detrended	-0.212	1.839	-0.120	1.171	1.478
Log Empirical	Exponential	0.371	1.926	0.010	0.562	7.634
	Exponential Detrended	0.585	2.071	-0.007	0.555	12.848
	Whittle	0.276	1.865	0.018	0.707	4.981
	Whittle Detrended	0.651	2.108	-0.005	0.496	18.171
	K-Bessel	0.585	2.072	-0.012	0.501	17.198
	K-Bessel Detrended	0.508	2.017	-0.009	0.625	10.368

[a] R-M-S = Root-Mean-Square.

Table S5. Different models for impact index of comprehensive quality (IICQ) based on the first two components (comp).

model	F	R Square	*p*
IICQ = 1.000 + 1.297 * (comp1) + 1.104 * (comp2)	50.376	0.652	9.367E-44
IICQ = 1.000 + 1.182 * (comp1) + 0.962 * (comp2) + 0.430 * (comp1) * (comp2)	66.605	0.718	3.778E-48
IICQ = -0.440 + $2.263^{(comp1)}$ + 0.244 * $(comp2)^3$	151.489	0.860	2.910E-61
IICQ = -0.440 + $2.272^{(comp1)}$ + 0.213 * $(comp2)^3$ + 0.206 * (comp1) * (comp2)	167.206	0.872	7.522E-63

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