

Supplementary Materials

Multi-Dimensional Assessment, Regional Differences, and Influencing Factors of Agricultural Water Pollution from the Perspective of Grey Water Footprint in Zhejiang Province, China

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Table S1. Parameters related to accounting for the livestock grey water footprint [1].

Name	Cattle		Pig		Sheep		Poultry	
	COD	TN	COD	TN	COD	TN	COD	TN
Feces (kg/t)	31	4.37	52	5.88	4.63	7.5	45.65	10.42
Urine (kg/t)	6	8	9	3.3	/	14	/	/
Fecal loss rate (%)	5.58	5.68	6.16	5.34	5.5	5.3	8.59	8.47
Urine loss rate (%)	50	50	50	50	50	50	50	50
Feces (kg/d)	20		2		2.6		0.125	
Urine (kg/d)	10		3.3		1		/	
Feeding cycle (d)	365		199		365		210	

Table S2. Parameters related to standard deviational ellipse (SDE) of agricultural grey water footprint (AGWF) in Zhejiang.

Year	Major axis (km)	Minor axis (km)	Azimuth (°)	Mean center of SDE	
				Longitude	Latitude
2010	142.80	105.71	16.89	120°12'16.61"	29°30'57.74"
2014	142.51	105.61	17.51	120°11'48.97"	29°30'25.71"
2017	139.47	107.41	13.48	120°12'23.86"	29°24'41.22"
2020	138.21	108.21	9.69	120°11'50.69"	29°20'50.43"

Table S3. Parameters related to SDE of agricultural grey water footprint efficiency (AGWFE) in Zhejiang.

Year	Major axis (km)	Minor axis (km)	Azimuth (°)	Mean center of SDE	
				Longitude	Latitude
2010	145.63	114.02	33.54	120°31'17.52"	29°30'35.83"
2014	145.59	113.09	32.73	120°29'21.11"	29°28'54.17"
2017	146.90	113.98	37.97	120°31'11.20"	29°31'41.39"
2020	144.93	112.84	36.96	120°29'27.11"	29°31'32.73"

Table S4. Parameters related to SDE of agricultural grey water footprint intensity (AGWFI) in Zhejiang.

Year	Major axis (km)	Minor axis (km)	Azimuth (°)	Mean center of SDE	
				Longitude	Latitude
2010	153.96	108.73	19.28	120°08'04.17"	29°12'34.84"
2014	153.48	111.51	19.04	120°12'21.63"	29°17'01.28"
2017	149.04	110.53	15.04	120°12'46.94"	29°11'43.93"
2020	148.97	110.46	14.07	120°12'52.60"	29°07'59.74"

Table S5. Parameters related to SDE of agricultural water pollution level (AWPL) in Zhejiang.

Year	Major axis (km)	Minor axis (km)	Azimuth (°)	Mean center of SDE	
				Longitude	Latitude
2010	125.23	94.31	21.71	120°35'17.37"	30°04'58.03"
2014	128.43	91.43	20.64	120°33'13.85"	30°04'41.99"
2017	140.24	98.04	8.65	120°28'44.20"	29°48'46.04"
2020	147.04	106.19	7.31	120°30'00.63"	29°32'33.00"

Table S6. Factor collinearity diagnosis results.

Factors	VIF
PS	3.309
EDL	3.348
TI	2.576
WRE	2.052
ECR	3.492
GY	3.438
CPS	1.473
IFA	1.962
IAFA	1.491
IPA	1.635

Table S7. The panel data regression results for Zhejiang and its sub-region's AGWF.

Variable	Zhejiang	Northeast	Southwest
Model	FE	FE	FE
PS	4.243***	5.571***	3.242***
	(3.873)	(3.841)	(3.158)
EDL	1.513***	1.022	1.191**
	(3.001)	(1.355)	(2.455)
TI	-0.349*	-1.418***	-0.175
	(-1.816)	(-4.054)	(-1.011)
WRE	-0.179	-0.403*	0.006
	(-1.204)	(-1.847)	(0.046)
ECR	-0.963	-5.664***	0.574
	(-1.147)	(-3.511)	(0.674)
GY	4.274***	3.958***	2.190***
	(11.427)	(7.960)	(4.249)
CPS	-2.206***	-2.411***	0.471
	(-8.631)	(-8.010)	(0.635)
IFA	3.729***	3.310***	4.683***
	(4.813)	(3.267)	(5.893)
IAFA	-1.046***	-0.458	-1.397***
	(-2.834)	(-1.007)	(-2.960)
IPA	0.701***	-0.514	1.264***
	(2.035)	(-0.997)	(3.430)
Constant	-50.991***	-29.646**	-52.205***
	(-5.363)	(-2.132)	(-5.801)
R ²	0.861	0.898	0.939

Statistic	$F=61.843, p=0.000$	$F=44.108, p=0.000$	$F=61.616, p=0.000$
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Note: Values within parentheses are the t values, * $p<0.1$, ** $p<0.05$, and *** $p<0.01$.

Table S8. The panel data regression results for Zhejiang and its sub-region's AGWFE.

Variable	Zhejiang	Northeast	Southwest
Model	RE	FE	FE
PS	0.323* (1.765)	-0.339 (-1.117)	0.785*** (3.205)
EDL	0.728*** (6.786)	0.890*** (5.398)	0.931*** (7.728)
TI	0.199*** (4.286)	0.358*** (4.977)	0.192*** (4.562)
ECR	0.337** (2.352)	1.481*** (4.227)	-0.230 (-1.119)
GY	-0.624*** (-7.252)	-0.594*** (-5.381)	-0.547** (-4.860)
CPS	0.244*** (4.308)	0.312*** (4.668)	0.136 (0.791)
IFA	-0.781*** (-5.173)	-0.628*** (-3.269)	-1.237*** (-7.882)
IAFA	0.208*** (3.736)	0.081 (0.795)	0.299** (2.459)
Constant	4.712*** (3.577)	2.634 (0.900)	5.856*** (3.075)
R ²	0.903	0.920	0.963
Statistic	$\chi^2=759.210, p=0.000$	$F=74.517, p=0.000$	$F=135.196, p=0.000$

Note: Values within parentheses are the t values, * $p<0.1$, ** $p<0.05$, and *** $p<0.01$.

Table S9. The panel data regression results for Zhejiang and its sub-region's AGWFI.

Variable	Zhejiang	Northeast	Southwest
Model	FE	FE	FE
PS	0.150*** (3.330)	0.147** (2.490)	0.154** (2.272)
EDL	-0.046** (-2.215)	-0.047 (-1.535)	-0.029 (-0.895)
TI	-0.020** (-2.593)	-0.034** (-2.365)	-0.016 (-1.386)
WRE	-0.006 (-0.981)	-0.012 (-1.405)	0.006 (0.668)
ECR	-0.384*** (-11.133)	-0.410*** (-6.261)	-0.390*** (-6.926)
GY	0.192*** (12.517)	0.193*** (9.536)	0.109*** (3.187)
CPS	-0.073*** (-6.994)	-0.077*** (-6.297)	0.027 (0.560)
IFA	0.210***	0.179***	0.301***

	(6.609)	(4.357)	(5.729)
IAFA	-0.025*	-0.010	-0.058*
	(-1.680)	(-0.515)	(-1.857)
IPA	-0.003	-0.019	0.011
	(-0.223)	(-0.885)	(0.452)
Constant	-1.085***	-0.663	-1.484**
	(-2.777)	(-1.174)	(-2.495)
R ²	0.919	0.904	0.952
Statistic	F=113.108, p=0.000	F=47.039, p=0.000	F=80.113, p=0.000

Note: Values within parentheses are the t values, * p<0.1, ** p<0.05, and *** p<0.01.

Table S10. The panel data regression results for Zhejiang and its sub-region's AWPL.

Variable	Zhejiang	Northeast	Southwest
Model	FE	RE	POOL
WRE	-8.845***	-14.853***	-3.630***
	(-7.207)	(-7.911)	(-11.235)
ECR	-2.477	5.475	-0.415
	(-0.416)	(0.931)	(-1.392)
GY	14.295***	9.501***	4.475***
	(8.091)	(3.195)	(8.918)
CPS	-16.572***	-14.347***	-1.779***
	(-9.101)	(-6.505)	(-5.815)
Constant	13.652	33.124***	5.391**
	(0.766)	(3.031)	(2.362)
R ²	0.621	0.678	0.759
Statistic	F=43.332, p=0.000	F=110.853, p=0.000	F=80.076, p=0.000

Note: Values within parentheses are the t values, * p<0.1, ** p<0.05, and *** p<0.01.

Reference:

1. Song, M.; He, W.; An, M.; Fang, X.; Wang, B.; Ramsey, T.S. Toward better agricultural grey water footprint allocation under economy-resource factors constraint. *Ecological Indicators* **2023**, *154*. <https://doi.org/10.1016/j.ecolind.2023.110806>