

Supplemental Information

Figure S1: Area of counties implementing the GFGP (a) Areas converted from farmland to grassland on L01-10 (b) Areas converted from farmland to grassland on L11-20 (c) Areas converted from farmland to forest and shrubland on L01-10 (d) Areas converted from farmland to forest and shrubland on L11-20

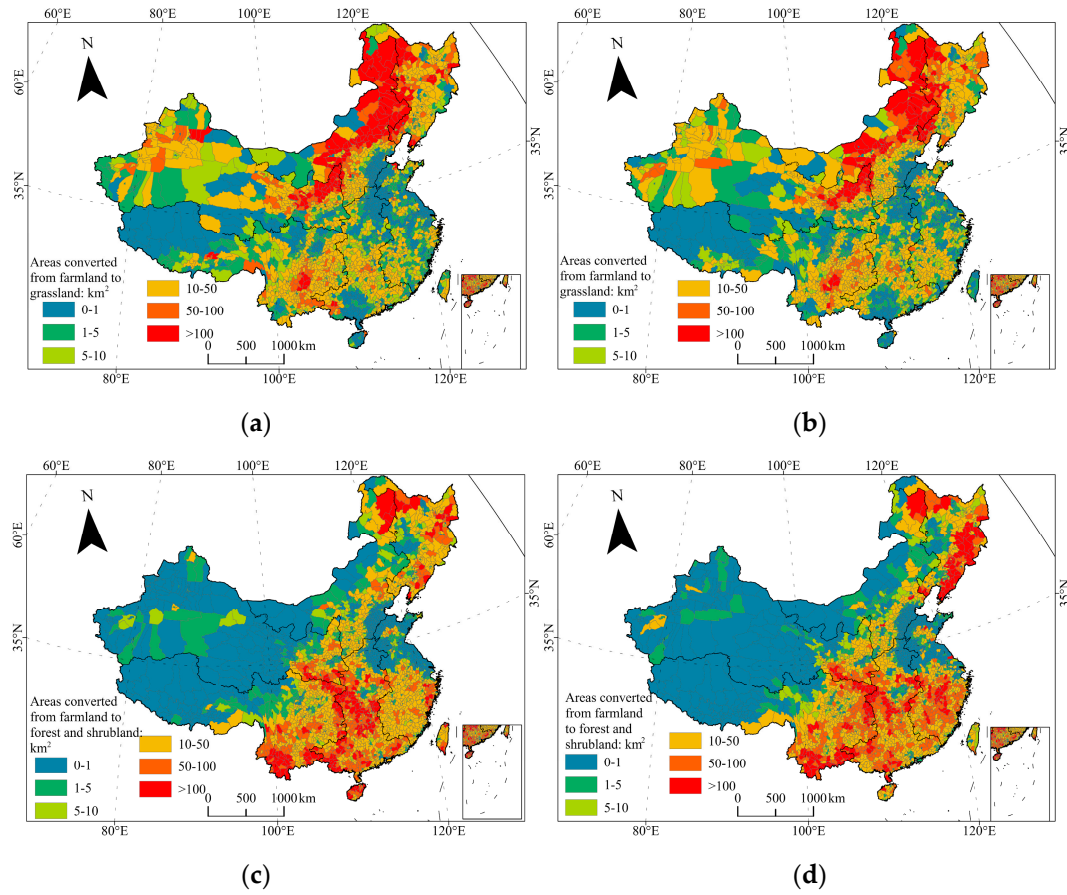


Table S1: Significance test for variation trend of NPP based on β and Z

Sen trend degree	Mann-Kendall trend test	Trend Categories	Trend Significance
$\beta > 0$	$2.58 < Z$	4	Extremely significant increase
	$1.96 < Z \leq 2.58$	3	Significant increase
	$1.65 < Z \leq 1.96$	2	Slightly significant increase
	$Z \leq 1.65$	1	No significant increase
$\beta = 0$	Z	0	No change
$\beta < 0$	$Z \leq 1.65$	-1	No significant reduction
	$1.65 < Z \leq 1.96$	-2	Slightly significant reduction
	$1.96 < Z \leq 2.58$	-3	Significant reduction
	$2.58 < Z$	-4	Extremely significant reduction

Table S2: Total NPP for vegetation on fallow land in six regions from 2011 to 2020

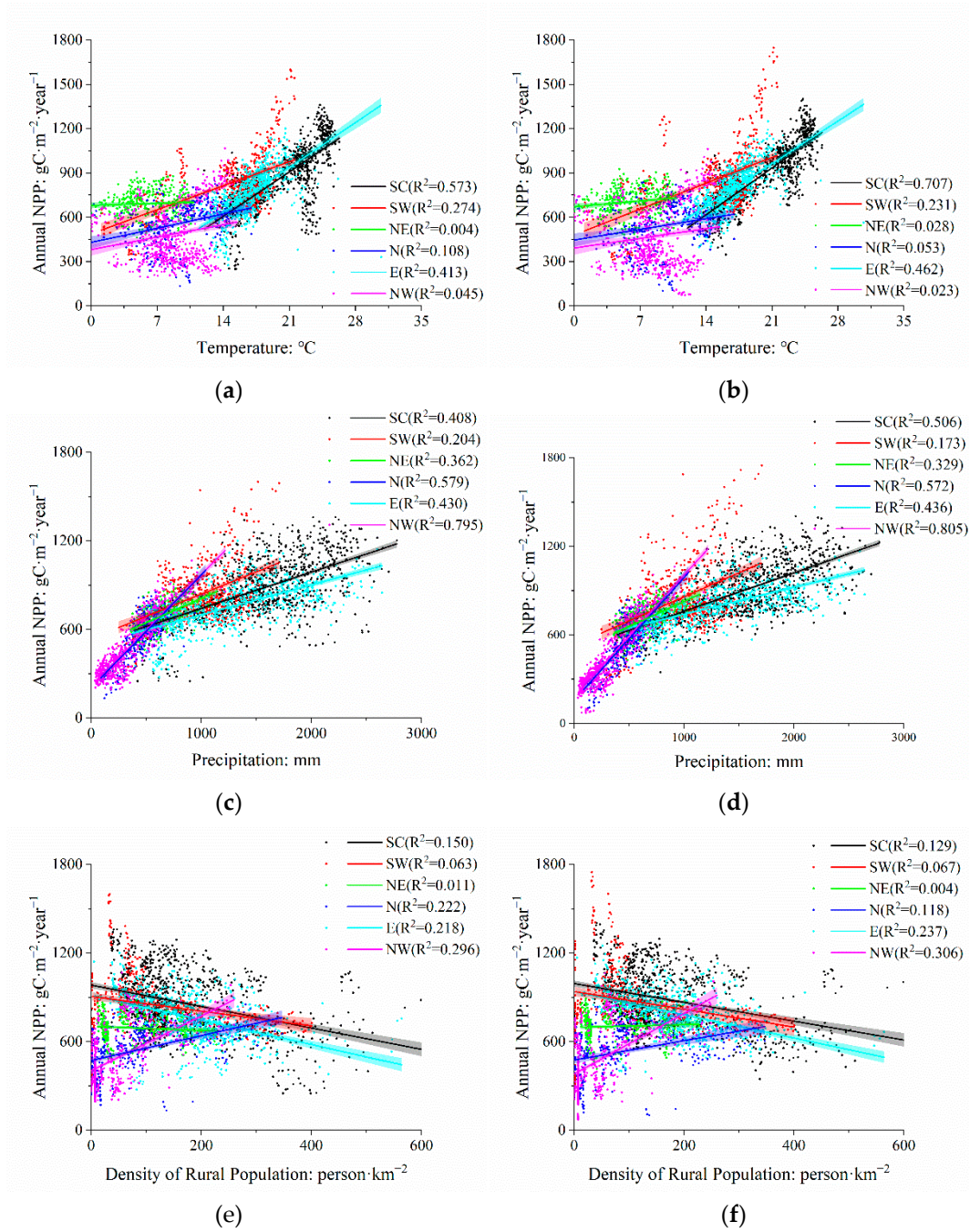
Types of farmland- converted lands	year	Annual NPP (GgC·year ⁻¹)					
		NE	NW	SW	SC	E	N
L01-10	2011	9461.97	8472.94	25,137.94	26,454.68	11,674.56	13,075.41
	2012	10,343.80	9167.68	23,771.45	26,419.12	12,144.40	14,685.45
	2013	10,081.45	9259.90	25,894.13	27,374.98	11,735.80	15,452.55
	2014	10,221.33	9322.78	25,284.16	26,838.59	11,994.90	14,939.13
	2015	10,351.43	9178.34	27,471.13	28,687.12	12,631.38	14,411.03
	2016	10,306.44	9200.99	27,201.59	28,666.07	12,298.58	15,262.25
	2017	10,368.10	9269.45	26,576.66	28,221.93	12,318.15	15,001.03
	2018	10,190.78	9769.67	26,503.52	28,783.02	13,061.25	15,141.34
	2019	10,919.86	9884.16	26,529.86	26,853.94	11,779.24	16,116.61
	2020	11,775.37	10,269.26	24,931.05	27,472.60	12,010.03	14,576.43
L11-20	2011	13,925.78	7463.91	25,446.78	21,433.48	16,283.62	10,072.60
	2012	15,268.72	8173.09	24,095.38	21,319.59	16,992.37	11,517.97
	2013	14,858.85	8245.67	26,629.13	22,116.98	16,228.66	11,866.39
	2014	14,997.85	8317.66	25,808.57	21,793.75	17,000.71	11,591.56
	2015	15,360.56	8135.35	28,204.89	23,303.21	17,690.93	11,176.53
	2016	15,397.48	8145.12	27,825.91	23,272.71	17,186.74	11,796.34
	2017	15,100.88	8231.84	27,201.15	22,938.19	17,322.51	11,646.98
	2018	14,981.03	8706.37	27,380.25	23,233.82	18,258.99	11,744.81
	2019	16,181.02	8813.65	27,367.46	21,619.26	16,391.57	12,557.80
	2020	17,018.22	9097.35	25,761.08	22,377.81	16,923.21	11,411.83

Table S3: Regression model statistical information

Types of farmland- converted lands	Variables	Area	Logistic Regression Model	R ²	P-Value
L01-10	Temperature	NE	$y=1.95x+681.036$	0.004	0.232
		NW	$y=12.094x+381.399$	0.0045	<0.001
		SW	$y=23.232x+488.786$	0.274	<0.001
		SC	$y=43.034x+4.154$	0.573	<0.001
		E	$y=43.256x+30.298$	0.413	<0.001
		N	$y=13.821x+429.827$	0.108	<0.001
	Precipitation	NE	$y=0.329x+481.271$	0.362	<0.001
		NW	$y=0.752x+219.335$	0.795	<0.001
		SW	$y=0.301x+538.675$	0.204	<0.001
		SC	$y=0.246x+497.201$	0.408	<0.001
		E	$y=0.202x+498.1$	0.43	<0.001
		N	$y=0.766x+204.581$	0.579	<0.001
	Density of Rural Population	NE	$y=0.144x+704.51$	0.011	0.048
		NW	$y=1.854x+403.084$	0.296	<0.001
		SW	$y=-0.489x+899.84$	0.063	<0.001
		SC	$y=-0.725x+983.141$	0.15	<0.001
		E	$y=-0.836x+914.902$	0.218	<0.001
		N	$y=0.84x+473.002$	0.222	<0.001
	Output Value of Animal Husbandry	NE	$y=-1.743x+713.884$	0.047	<0.001
		NW	$y=11.695x+459.792$	0.058	<0.001
		SW	$y=-2.234x+865.499$	0.014	0.007
		SC	$y=-11.145x+947.912$	0.147	<0.001
		E	$y=-7.535x+780.204$	0.16	<0.001
		N	$y=3.487x+520.622$	0.034	0.001
L11-20	Temperature	NE	$y=5.659x+671.169$	0.028	0.001
		NW	$y=9.363x+391.926$	0.023	0.001
		SW	$y=24.991x+480.998$	0.231	<0.001
		SC	$y=45.391x-18.635$	0.707	<0.001
		E	$y=41.214x+98.699$	0.462	<0.001
		N	$y=10.356x+445.757$	0.053	<0.001
	Precipitation	NE	$y=0.342x+485.267$	0.329	<0.001
		NW	$y=0.825x+180.651$	0.805	<0.001
		SW	$y=0.325x+533.163$	0.173	<0.001
		SC	$y=0.26x+501.426$	0.506	<0.001
		E	$y=0.183x+557.2$	0.436	<0.001
		N	$y=0.829x+159.76$	0.572	<0.001
		NE	$y=0.094x+697.187$	0.004	0.235

Density of Rural Population	NW	$y=2.05x+381.345$	0.306	<0.001
	SW	$y=-0.591x+930.811$	0.067	<0.001
	SC	$y=-0.636x+993.396$	0.129	<0.001
	E	$y=-0.789x+940.197$	0.237	<0.001
	N	$y=0.653x+476.023$	0.118	<0.001
Output Value of Animal Husbandry	NE	$y=-1.973x+728.955$	0.051	<0.001
	NW	$y=10.24x+458.59$	0.039	<0.001
	SW	$y=-2.762x+889.932$	0.015	0.004
	SC	$y=-11.81x+979.116$	0.184	<0.001
	E	$y=-5.179x+796.575$	0.107	<0.001
	N	$y=1.359x+528.522$	0.004	0.213

Figure S2: Correlation between NPP and (a) temperature on L01-10, (b) temperature on L11-20, (c) precipitation on L01-10, (d) precipitation on L11-20, (e) rural population density on L01-10, (f) rural population density on L11-20, (g) animal husbandry output value on L01-10 and (h) animal husbandry output value on L11-20



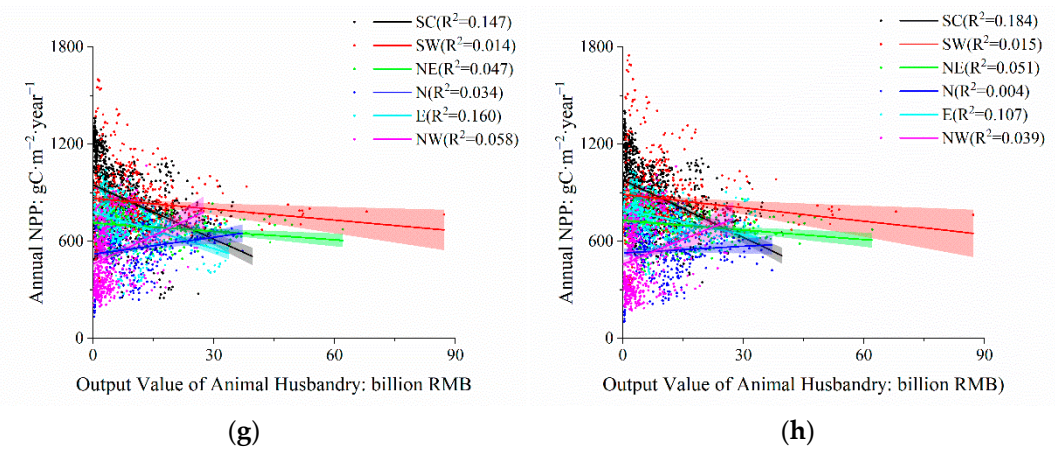


Figure S3: Six regions constraints between NPP and (a) rural population density on L01-10 (b) rural population density on L11-20 (c) animal husbandry output value on L01-10 in pastoral areas (d) animal husbandry output value on L11-20 in pastoral areas

