

Supplementary Materials: Environmental Change in the Agro-pastoral Transitional Zone, Northern China: Patterns, Drivers, and Implications

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Table S1. Summary of hydrological characteristics in the Chengde city and neighboring basins.

ID	River	Gauge Station	River Length (km)	Drainage Area (km ²)	Location		Time Series
					Latitude (° ' N)	Longitude (° ' E)	
1	Luan River	Sandaohezi	522.8	17,100	41°02'	118°19'	1958–2002
2	Xingzhou River	Boluonuo	84.5	1378	41°04'	117°20'	1960–2002
3	Wulie River	Chengde	99.0	2200	40°46'	118°10'	1957–2002
4	Liu River	Liyang	63.5	626	41°25'	116°35'	1957–2002
5	Yixun River	Hanjiaying	217.4	6787	41°48'	117°19'	1957–2002
6	Laoniu River	Xiabancheng	69.5	1615	40°45'	118°10'	1968–2002

Table S2. Summary of meteorological stations in the Chengde city and neighboring

ID	Gauge Station	Location		Time Series
		Latitude (° ' N)	Longitude (° ' E)	
1	Yebaishou	41°23'	119°42'	1956–2011
2	Qinhuangdao	39°51'	119°31'	1956–2011
3	Huailai	40°24'	115°30'	1956–2011
4	Zhangjiakou	40°47'	114°53'	1956–2011
5	Chifeng	42°16'	118°56'	1956–2011
6	Qinglong	40°24'	118°57'	1956–2011
7	Zunhua	40°12'	117°57'	1956–2011
8	Miyun	40°23'	116°52'	1956–2011
9	Duolun	42°11'	116°28'	1956–2011
10	Fengning	41°13'	116°38'	1956–2011
11	Weichang	41°56'	117°45'	1956–2011
12	Chengde	40°59'	117°57'	1956–2011

Table S3. Summary of water quality monitoring stations in the Chengde city and neighboring area.

ID	River	Station	Location		Time Series
			Latitude (° ' N)	Longitude (° ' E)	
1	Luan River	Guojiatun	41°34'	117°06'	1993–2000
2	Luan River	Sandaohezi	41°02'	118°19'	1993–2000
3	Luan River	Shangbancheng	40°49'	118°03'	1987–2001
4	Luan River	Wulongji	40°42'	118°08'	1987–2001
5	Yixun River	Weichang	41°56'	117°45'	1993–2000
6	Yixun River	Miaogong Reservoir	41°45'	117°49'	1993–2000
7	Yixun River	Longhua	41°18'	117°44'	1993–2000
8	Yixun River	Hanjiaying	41°48'	117°19'	1993–2000
9	Wulie River	Chengde	40°46'	118°10'	1993–2000
10	Laoniu River	Xiabancheng	40°45'	118°10'	1993–2000
11	Liu River	Xinglong	40°25'	117°30'	1990–2001
12	Liu River	Liyangyi	41°06'	117°59'	1993–2000
13	Pu River	Pingquan	41°01'	118°42'	1990–2001
14	Pu River	Kuancheng	40°36'	118°29'	1993–2000
15	Sa River	Lanqiying	40°23'	118°01'	1993–2000
16	Chao River	Dage	41°12'	116°38'	1985–2001
17	Chao River	Daiying	40°42'	117°10'	1993–2000

Table S4. Summary of air quality monitoring stations in the Chengde city and neighboring area.

ID	Station	Location		Time Series
		Latitude (° ' N)	Longitude (° ' E)	
1	Xingtai	37°04'	114°30'	2000–2012
2	Shijiazhuang	38°02'	114°30'	2000–2012
3	Handan	36°37'	114°32'	2000–2012
4	Baoding	38°52'	115°27'	2000–2012
5	Hengshui	37°44'	115°40'	2000–2012
6	Tangshan	39°37'	118°10'	2000–2012
7	Langfang	39°32'	116°41'	2000–2012
8	Cangzhou	38°18'	116°50'	2000–2012
9	Beijing	39°54'	116°24'	2000–2012
10	Tianjin	39°05'	117°12'	2000–2012
11	Qinhuangdao	39°56'	119°36'	2000–2012
12	Chengde	40°57'	117°57'	2000–2012
13	Zhangjiakou	40°46'	114°53'	2000–2012



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