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Migration of Rural Residents to Urban Areas Drives Grassland Vegetation Increase in China's Loess Plateau

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Supplementary Materials

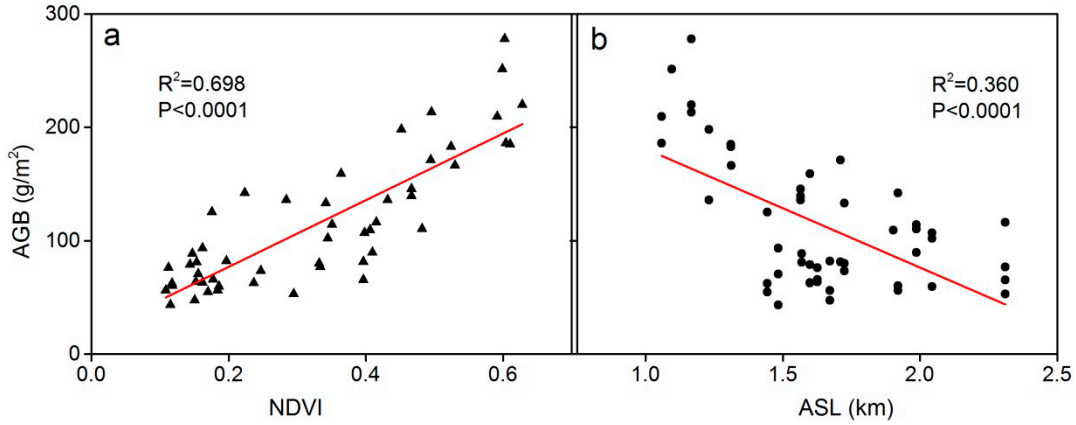

Figure S1. Relationships between AGB of sampling sites plot and (**a**) NDVI; and (**b**) elevation.

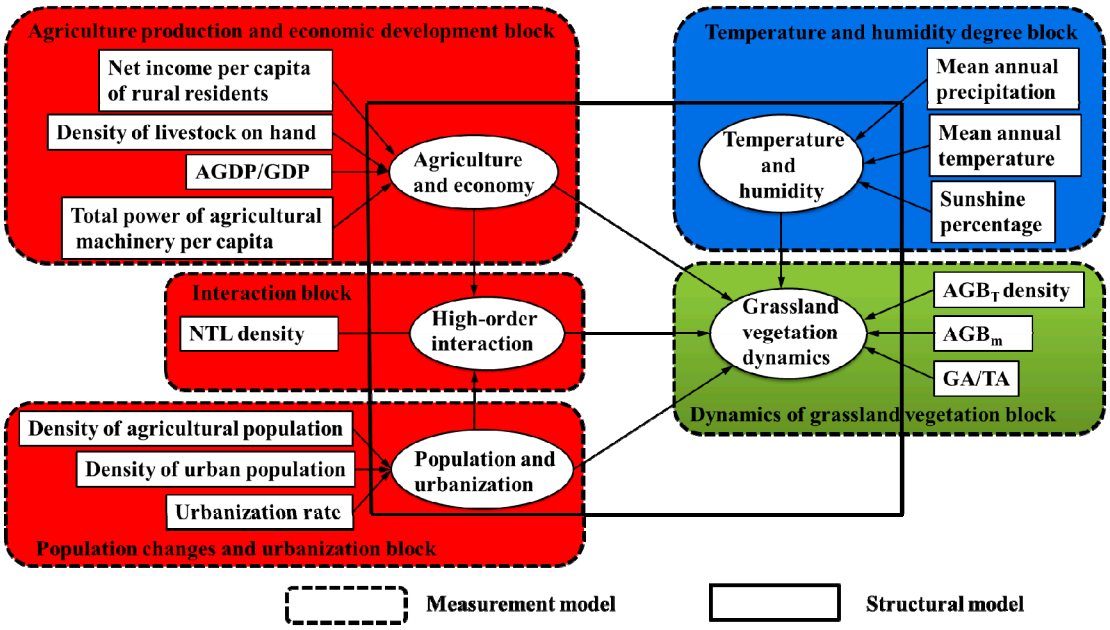

Figure S2. Conceptual model depicting the proposed relations among agriculture production and economic development (AP&ED), population changes and urbanization (PC&U), interaction of AP&ED and PC&U (High-order interaction), temperature and humidity degree and dynamics of grassland vegetation. The measurement model relates the indicator to the latent variables. The structural model relates all latent variables. Manifest variables: net income per capita of rural residents, the density of livestock on hand, the proportion of the added value of the primary industry to GDP (AGDP/GDP) , total power of agricultural machinery per capita; the density of agricultural population, the density of urban population, urbanization rate; density of stable nighttime light (NTL density); mean annual precipitation, mean annual temperature, sunshine percentage; AGB_T density, AGB_m, the proportions of the grassland area to the total area (GA/TA).

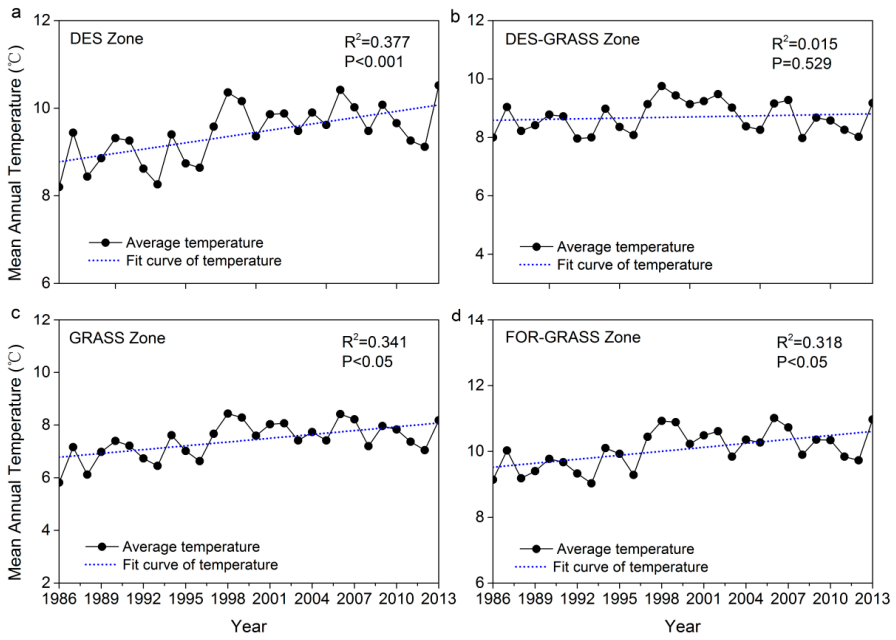

Figure S3. Inter-annual average temperature(°C) of all study county changes in: (a) deserts zone; (b) desert-grasslands zone; (c) typical grasslands zone; (d) forest-grasslands zone.

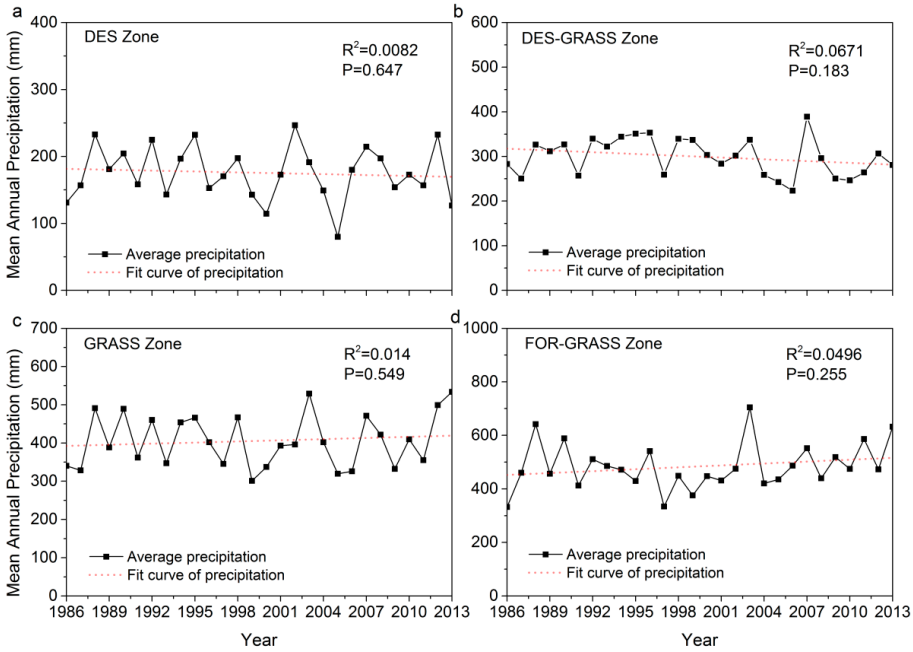

Figure S4. Inter-annual average precipitation (mm) of all study county changes in: (a) deserts zone; (b) desert-grasslands zone; (c) typical grasslands zone; (d) forest-grasslands zone.

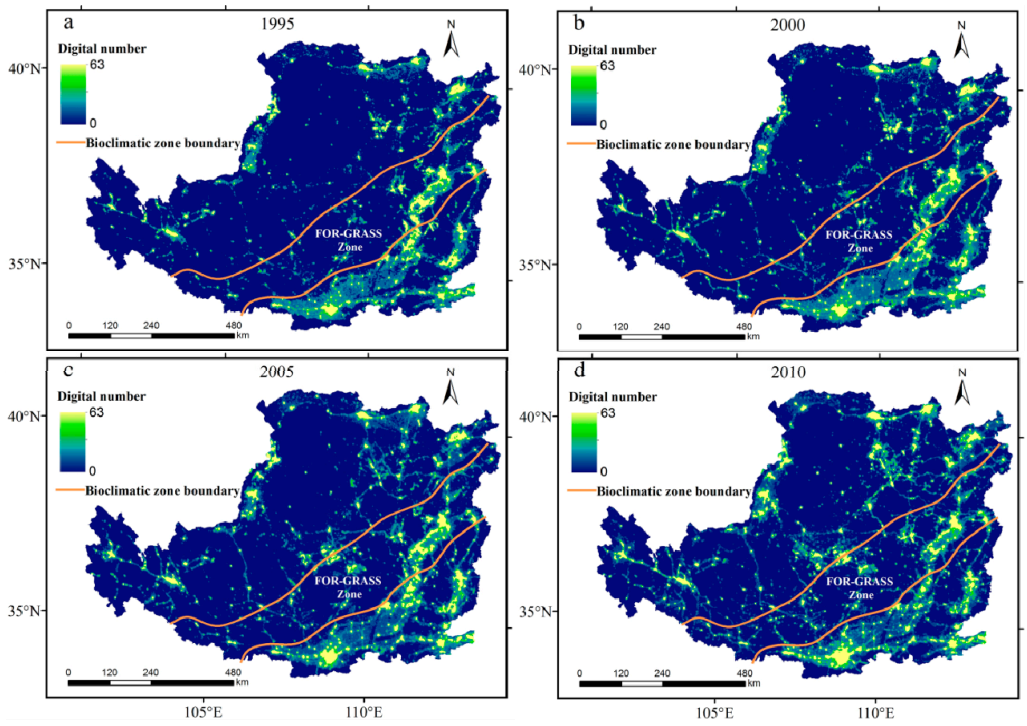

Figure S5. The DMSP/OLS night-time light intensity images of the Loess Plateau in (**a**) 1995; (**b**) 2000; (**c**) 2005; (**d**) 2010.

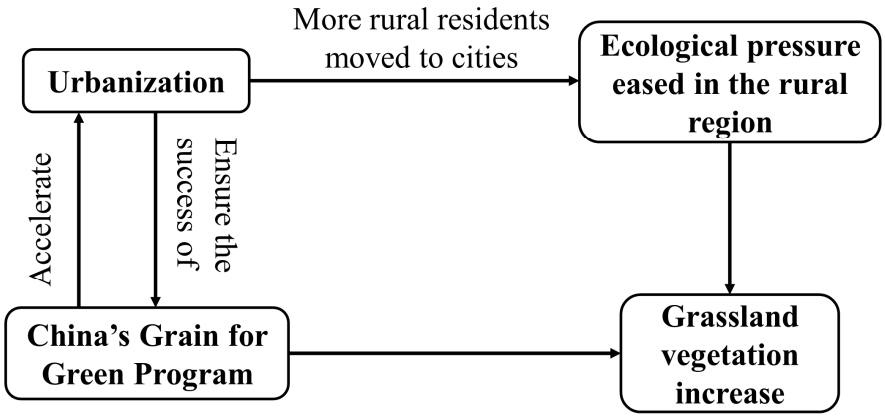

Figure S6. The inherent relation between grassland vegetation increase and urbanization in the Loess Plateau.

Table S1. The specific year when the remote sensing images were used to perform the supervised classification for each study counties.

Study County	Supervised Classification Year				
Jingtai	1992	1997	2003	2005	2008
Yongning	1995	2002	2007	2009	
Helan	1995	2002	2007	2009	
Linhe	1996	2000	2005	2010	
Yuzhong	1997	2002	2008	2011	

Gaolan	1997	2002	2006	2011					
Minhe	1994	2001	2006	2009					
Jingyuan	1993	1997	2000	2008					
Yanchi	1996	2002	2005	2010					
Wuqi	1991	1995	2000	2005	2007	2010			
Dingbian	1991	1995	2000	2005	2007	2010			
Wuzhai	1993	1997	2000	2002	2005	2007	2010		
Tuoketuo	1993	1996	1998	2000	2003	2007	2009		
Hequ	1993	1997	2000	2002	2005	2007	2010		
Xiji	1994	1999	2003	2007					
Gangu	1994	2002	2007	2010					
Xifeng	1991	1995	2000	2005	2007	2010			
Changwu	1991	1995	1997	2003	2009				
Qingxu	1991	1993	1996	1998	2000	2004	2006	2011	
Yuanping	1991	1993	1997	2000	2002	2004	2006	2009	2011
Lishi	1993	1997	2000	2005	2011				
Xixian	1993	1997	2000	2005	2008	2011			