

Supplementary Materials

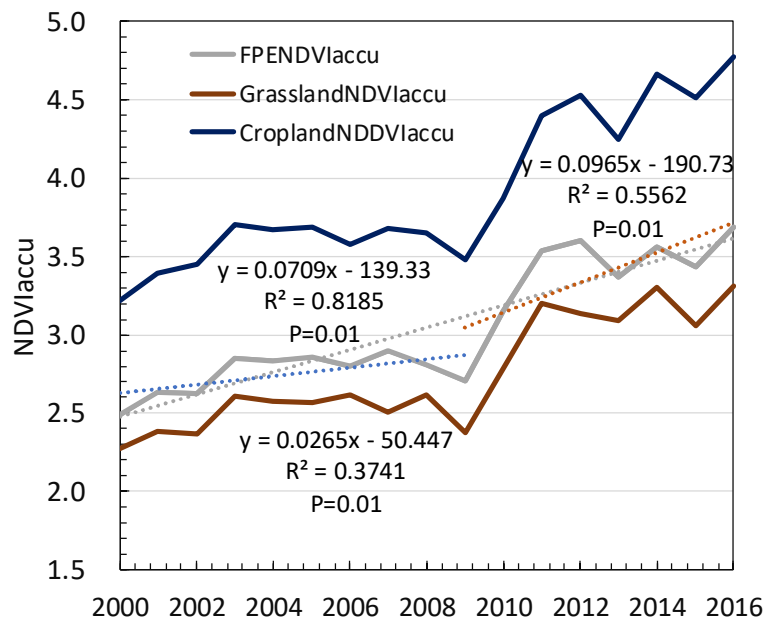


Figure S1 Changes of FPE NDVIaccu, cropland NDVIaccu and grassland NDVIaccu (NDVIaccu: growing season annual accumulative normalized difference vegetation index)

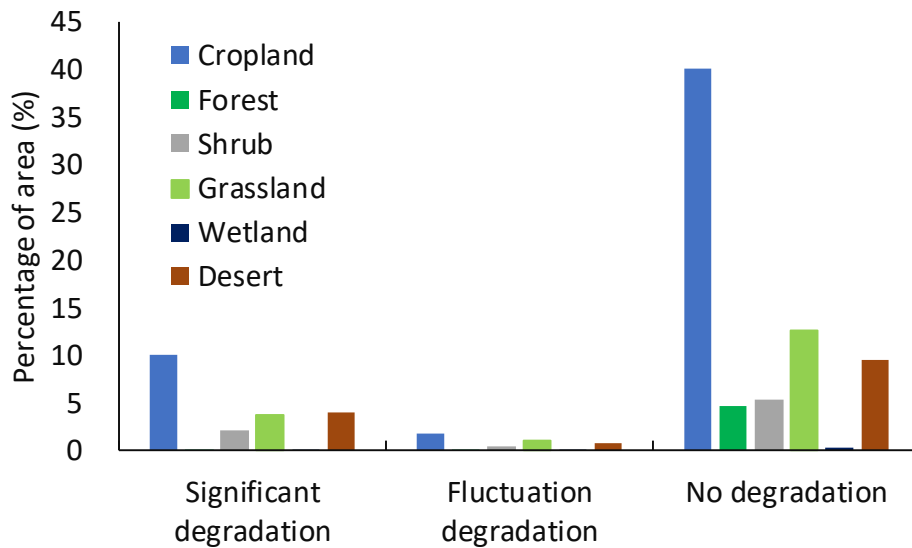


Figure S2 Vegetation degradation of different land use types

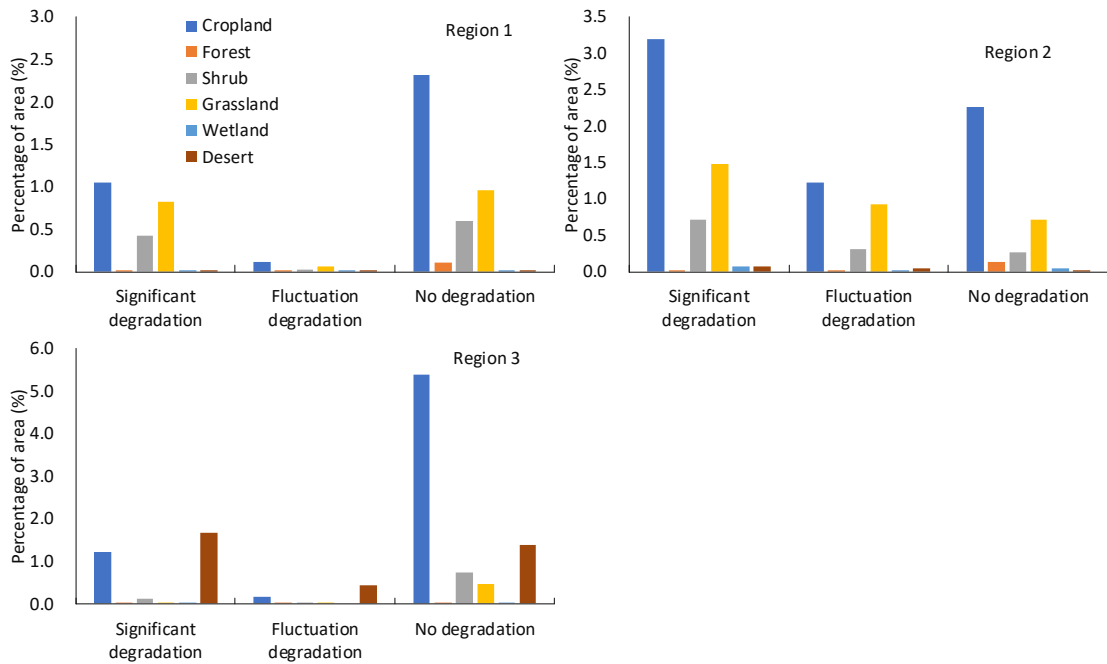


Figure S3 Vegetation degradation of different land use types in typical region

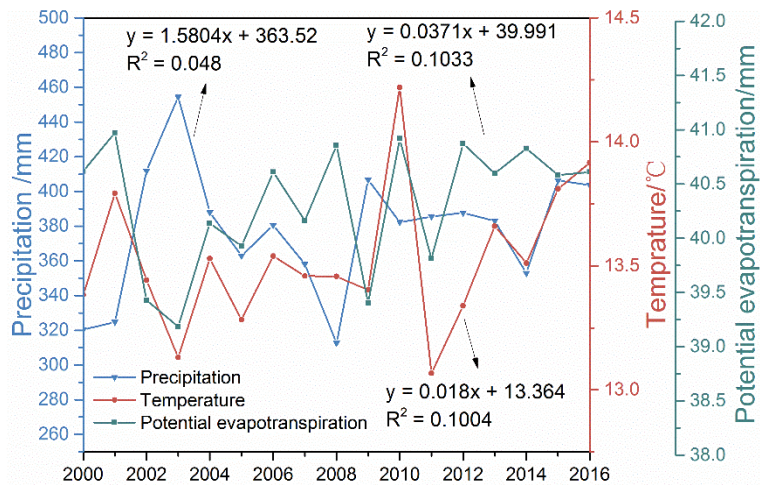


Figure S4 Changes of precipitation, temperature and potential evaporation

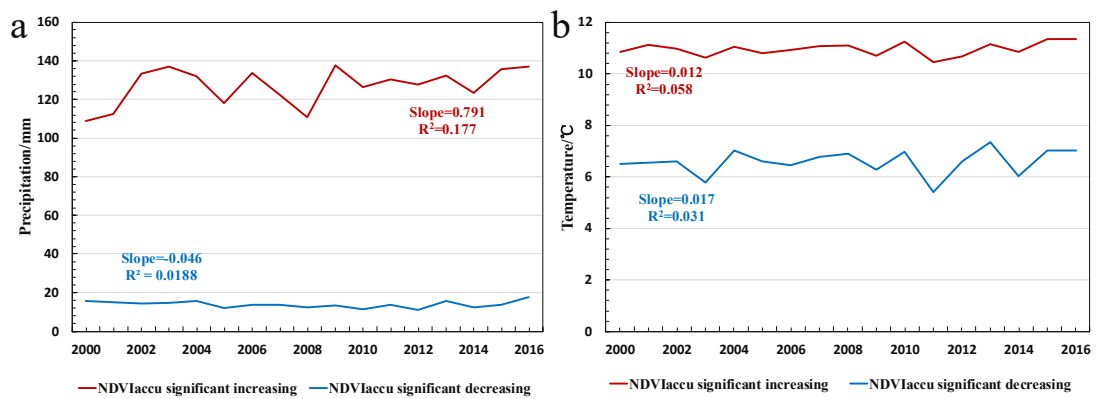


Figure S5 Changes of NDVIaccu under disparate scenario of precipitation (a) and temperature (b), respectively

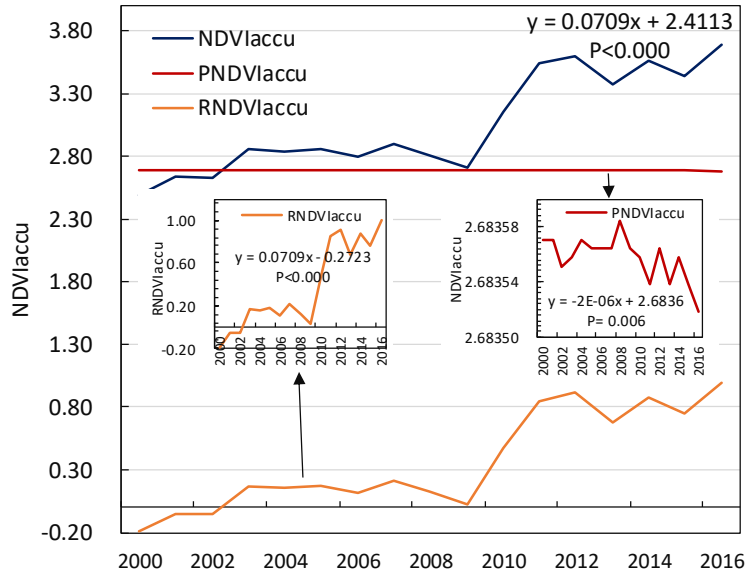


Figure S6 Changes of NDVIaccu, PNDVIaccu and RNDVIaccu (NDVIaccu: observed NDVIaccu; PNDVIaccu: potential NDVIaccu; RNDVIaccu: residual NDVIaccu)

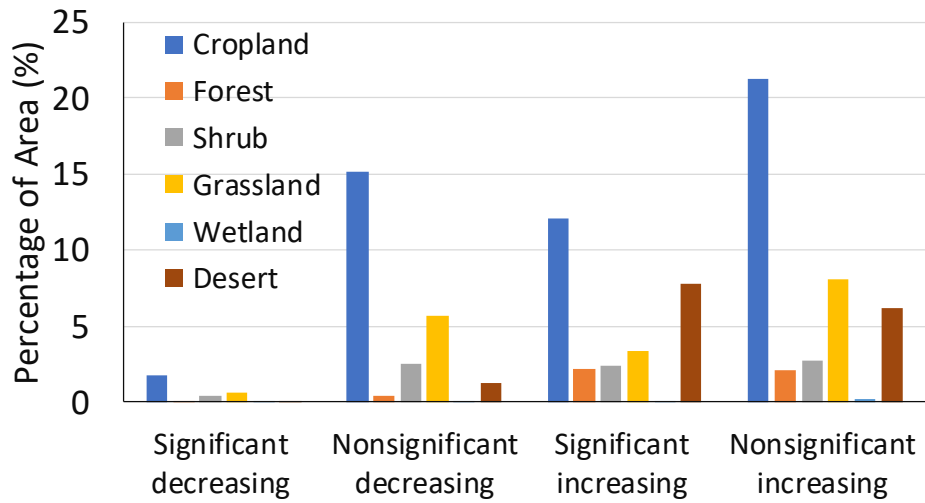


Figure S7 The impact of different land use types on RNDVIaccu

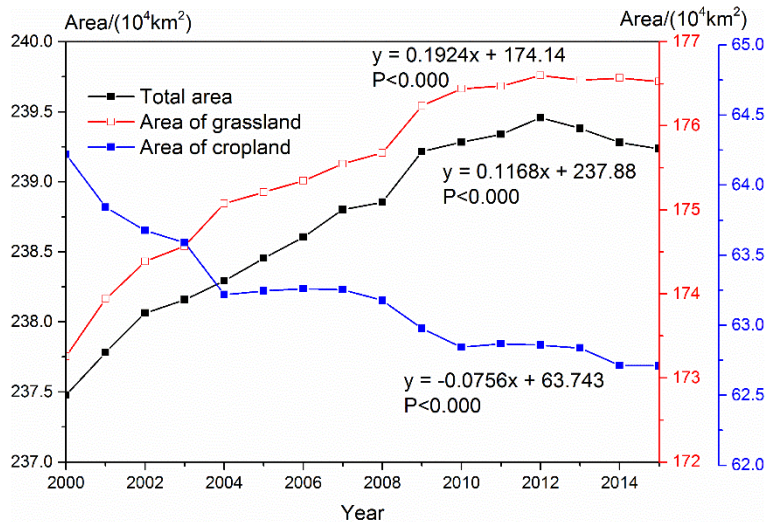


Figure S8 Area change of cropland and grassland

Table S1 Change trends of population, fertilizers, agricultural production and livestock in FPE

Name of country	Population in 2015($\times 10^6$)	Pearson coefficient	Change rate	Fertilizers in 2015 (kg/ha)	Pearson coefficient	Change rate	Agricultural production in 2014 (10^8 Int. \$)	Pearson coefficient	Change rate	Livestock in 2015 ($\times 10^7$)	Pearson coefficient	Change rate
Afghanistan	33.74	0.845**	0.884*	5.39	0.598*	0.463*	16.83	0.896**	0.394*	0.07	0.812**	0.003*
Algeria	39.87	0.905**	0.579*	0.01	-0.235	0.030*	0.03	-0.632**	0.022*	0.03	0.900**	0.001*
Armenia	2.92	-0.800**	-0.12*	0.52	0.700**	0.014*	0.14	0.647**	0.004*	0.03	-0.402	0.000
Azerbaijan	9.62	0.798**	0.100*	0.77	0.559*	0.037*	1.01	0.786**	0.031*	1.09	0.819**	0.022*
China	1428.36	0.836**	7.777*	18.58	0.766**	0.037*	0.00	-	0.031*	0.00	-0.707**	-0.003*
Iran	79.36	0.777**	0.867*	12.07	0.385	0.276	35.01	0.723**	0.652*	0.95	0.136	0.170
Iraq	36.12	0.806**	0.819*	0.45	0.085	0.000	0.44	0.491	0.003	0.80	0.795**	0.033*
Israel	8.06	0.824**	0.143*	-	-	-	0.00	-	-	0.01	0.782**	0.016*
Jordan	9.16	0.841**	0.281*	0.62	0.111	-0.011	0.01	0.524*	0.003*	0.02	0.462	0.004*
Kazakhstan	17.75	0.666**	0.185*	3.07	0.696**	0.180*	65.14	0.702**	1.551*	0.19	0.505*	0.005*
Kyrgyzstan	5.87	0.659**	0.064*	-	-	-	-	-	-	0.15	0.698**	0.004*
Morocco	34.8	0.878**	0.393*	0.24	0.132	-0.008	0.38	-0.147	-0.011	0.08	0.904**	0.002*
Pakistan	189.38	0.900**	3.378*	9.05	0.581*	0.184*	28.1	0.843**	0.731*	22.35	0.900**	0.651*
Russian	143.89	-0.424	- 0.147*	2.83	0.634**	0.068*	101.21	0.887**	1.650*	4.11	-0.713**	-0.126*
Syrian	18.74	0.408	0.231*	0.01	-0.445	- 0.007*	0.12	0.745**	0.003*	0.08	0.202	0.001*
Tajikistan	8.55	0.811**	0.157*	30.23	0.497	1.190*	8.55	0.778**	0.354*	0.27	0.770**	0.010*
Tunisia	11.27	0.791**	0.105*	-	-	0.000	0.00	0.122	0.000	0.02	-0.516*	-0.001*
Turkey	78.27	0.835**	0.976*	10.26	0.549*	0.284*	44.76	0.845**	1.301*	4.80	0.699**	0.076*

Turkmenistan	5.57	0.848**	0.070*	-	-	-	0.18	0.552*	0.005*	0.00	0.674**	0.030*
Uzbekistan	30.98	0.769**	0.411*	-	0.351	1.459*	33.02	0.667**	1.297*	0.25	0.735**	0.009*
	2192.28	0.649	0.858*	94.10	0.373	0.243*	334.93	0.555	0.443	35.30	0.423	0.045*

Note: the data in this table is not the all country value, these data were preprocessed using the area weighting method. The significance level representing $p < 0.01$ and $p < 0.05$ was indicated using ** and * respectively, in the upper-right of the Pearson correlation coefficient.