

Inter-annual dynamics of grassland yields and assessment of herbage supply in the headwater region of three rivers over 18 years

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Introduction The headwater region of the Yangtze , Yellow and Lantsang rivers is one of the most important ecological function regions in China , and in eastern Asia . In recent decades , because of climate change and excessive human induced utilization , grasslands in the region have degenerated badly (Wang et al , . 2005) . Thus , it is necessary to analyze grassland productivity dynamics to assess changing trends of grassland supply . We discuss reasons for observed changes . This analysis will be helpful for establishing effective strategies in grassland conservation and management .

Method Inter-annual dynamics of grassland yield from 1988-2005 were analyzed using the GLOPEM-CEVSA model . The change index of herbage supply was determined by regression slope/mean yield over these 18 years . A stability index was determined by coefficient of variation (CV) .

Result The grassland productivity varied with grassland type over these 18 years . In general , grassland yield show increase trend in last 18 years , and increase markedly in alpine desert and alpine steppe of the western part (Table 1) .

Table 1 Grasslands yield and assessment of herbage supply from 1988-2005 .

Grassland types	Mean yield (kg/ha)	s . d .	CV(%)	Slope	Changet rend	supply Stability
Temperate steppe	754 .32	278 .63	36 .94	5 .58	→	Low
Alpine meadow	529 .85	61 .00	11 .51	3 .33	→	Medium
Alpine steppe	144 .67	42 .83	29 .61	3 .29	↗	Low
Alpine desert	133 .97	56 .09	41 .87	6 .23	↑	Low
Marsh	868 .91	139 .60	16 .07	9 .87	↗	Medium

Discussion This study indicated that the grasslands in the western arid areas were affected by inter-annual climatic fluctuation , which resulted in a herbage supply shortage . This will likely lead to grassland degradation . A trend for increased grassland productivity over this 18 year period was mainly driven by climate change . Human impacts were mostly restricted . We should be cautious that any increased herbage supply in these areas are minor compared tp long-term negative impacts of climate change on ecosystem holistic functions .

Reference

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