



Interaction between vegetation and local climate in the agriculture-stockbreeding mixture zone of Loess Plateau, China

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This paper focuses on the interaction of vegetation evolution and climate change in the center of Chinese Loess Plateau. The domain is located at 35-40°N 106-111°E, where agriculture and stockbreeding are dominant.

The results show that vegetation in this region experienced the change from forest to grass, when the local climate experienced the alternate changes from warm-wet to cold-dry during the period between the early of geology and history era. It is clear that climate changed vegetation and vegetation made a feedback on climate. Although the influence of human being's activity on vegetation environment increased gradually, nature vegetation had no obvious change owing to a good climate environment from the middle history era to the later of Song dynasty (about the year of 1276). However, at the early of Ming dynasty (about the year of 1368) to the later of Qing dynasty (about the year of 1636), climate alternated into its cold-dry period and strengthened the effect of human's continue destroying to vegetation. As a result, the next climate alternated to warm-dry phase instead of warm-wet phase in the latter-day time. The vegetation suffered from a series of significant damages and human's activity was up to the main factor. From the 5th decade of 20th century, human's plantation was developing fast, so, this area's vegetation became renew bit by bit. Along with the Great Wall line in the north part of this area, the frequency of sandstorm events decreased notably during the period from the 8th decade of 20th century owing to the plantation of shelterbelt, which began from the 5th decade of 20th century. In the contrast, at the Ziwu mountain range, which is in the south part of this area, the convective

precipitation decreased of 28% from the latter of the 6th decade to the early of 7th decade due to the disafforestation and farming. The local climate is dryer and dryer because of lack of rainfall. The various nature disasters, such as drought, floods, and hailstone etc, increase (decrease) during the vegetation deterioration (improvement). It is concluded that the developing of vegetation can effectively alleviate the damages of nature disasters.

Key words: agriculture-stockbreeding mixture zone, vegetation ecology, climate change