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The Effect of Environmental Protection on the Devastation of the Grazing Meadows and Livestock Production

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Abstract

China's appetite for meat products has grown over the last few decades, and this has coincided with a worsening of the degradation of grasslands. Many governmental initiatives have been put forth as a result to re-establish balance between pastoral livestock production and the grassland ecosystem. This paper examines the widespread eco-environmental programme known as the Subsidy and Incentive System for Grassland Conservation in the pastoral regions of Inner Mongolia. We analyse how it impacts the health of the grasslands and the productivity of the animals. For the purpose of assessing the status of meadows, the Standardized Contrast Vegetation File is used. We used data from 52 counties collected over a 15-year period, 10 years before and 5 years after the implementation of SISGC, to conduct our empirical research. Simultaneous equation models are used to examine the connection between livestock productivity and grassland health. The results indicate that the SISGC has greatly improved the condition of the grasslands. The SISGC has reduced the overall animal population, especially the sheep population, but has had no impact on the vast monster population. On the other hand, as a result of rising meat prices, the population of sheep, large animals, and all livestock has increased. The SISGC's ability to maintain control over the expanding cattle population in pastoral areas shows that it has been successful in halting the destruction of the grasslands. Additional strategy pushes are required to take into account how to prevent field degradation in light of the rising demand for meat among the Chinese populace and to handle the elevated level of destitution among pastoralists, in addition to limiting the population of domesticated animals.

Keywords: Environmental preservation; Grassland degradation; Vegetation; Livestock production

Introduction

Grasslands make up 26% of the world's total land area and 70% of its agricultural land. Due to the increasing demand for livestock products, the significant level of poverty among pastoralists, and the deteriorating worldwide degradation of grasslands, the sustainable use and management of grasslands has been of major concern to academics, policymakers, and non-governmental organisations. Numerous nations have put eco-environmental regulations into place in an effort to balance the needs of agricultural households, the production of livestock, and the preservation of grasslands [1, 2]. How effectively do the existing policy interventions support the sustainable use and management of grasslands? The goal of this research is to assess how the Subsidy and Incentive System for Grassland Conservation, a specialised eco-environmental policy, affects the conservation of grasslands and the production of animals in the typical pastoral region of China.

Arid or semi-arid environments, which are particularly prone to salinization, desertification, and degradation, are where over 80% of these grasslands are found. Over 17 million people rely on grasslands for their livelihoods through the grazing of animals. Six autonomous regions make up the majority of China's grasslands, which combined make up 75% of the nation's grasslands and are home to 70% of the nation's grazing cattle [3]. These areas have long-standing traditional pastoralism until experiencing a land tenure change in the 1980s and a number of eco-environmental policies about 2000.

In order to meet the nation's increased demand for meat as a result of urbanisation, population growth, and rising disposable incomes, China's livestock production has, on the one hand, surged. China produced 10.6, 23.6, 1.8, and 1.2 times as much beef and mutton in 2017 as it did in 1980, as well as 1.8 and 1.2 times as much beef in 2013. Between 2013 and 2017, consumption of both lamb and hamburger increased by 27% and 44%, respectively [4]. The production of animals in pastoral areas has a great capacity to reduce the rising demand for livestock-derived goods.

Grassland degradation is a worldwide problem, but it is particularly bad in China. Although pastoralists, scholars, and government representatives all agree that China's grasslands are degrading, no official information is available regarding how severe it is [5]. According to a well-known estimate, by the 2000s, almost 90% of China's grasslands were in some manner damaged, and every year, about 2 million hectares of grassland deteriorate. Feng found that the overall area of grassland in Qinghai province dramatically shrunk between 1976 and 2006. The western grassland boundary has shifted around 100 kilometres east during the past few decades, whereas the northern grassland limit has moved about 200 kilometres south. Examples of deterioration of grasslands include loss of grassland productivity, decline in soil fertility, increase in the diversity of unpleasant grass species, and soil compaction [6]. Most crucially, the deterioration and desertification of the grasslands in northern China were a major contributor to a number of natural disasters in the late 1990s. Frequent flooding of the Yangtze River, droughts in the Yellow River valleys, and sandstorms in northern metropolises all has a detrimental effect on human health and result in large financial losses. As a result, grassland degradation threatens not just the livelihoods of pastoralists but also the ecological security of the country.

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The increasing attention being paid to improving grassland ecosystems has led to the implementation of numerous environmental policies and projects in China. These policy initiatives have primarily focused on grassland conservation by sowing grass and, more specifically, by reducing the livestock population in pastoral areas because overgrazing is commonly believed to be a major source of grassland degradation [7, 8]. In order to reduce the population of their grazing cattle and rear animals in captivity rather than through pastoral grazing, a variety of eco-environmental projects have targeted pastoralists in pastoral areas. Furthermore, as degraded grassland becomes inappropriate for grazing, livestock production is becoming more and more dependent on crop stalks, bran, and other grain by products, which are more easily accessible in crop regions. During the 1990s, the central government of China has also mandated the transportation of dairy cattle and sheep production from traditional eating regions to grain-delivery zones [9, 10]. This policy was strengthened in the wake of a series of ecological disasters in the 2000s. Following that, China's total livestock production has gradually expanded, but less livestock is now raised in pastoral areas. Yet, the adoption of eco-environmental programmes and the reallocation of cattle output have hampered traditional pastoralists whose livelihoods depend on grazing in pastoral areas. Pastoralists could suffer from financial hardship while receiving almost no compensation for reducing their contact with domestic animals, which prevents them from enforcing these restrictions.

Have the eco-natural configurations been effective at protecting the prairie? Moreover, have they impacted the cattle productivity in the pastoral areas? These issues have primarily worried governments and academic communities. According to government reports, SISGC has assisted in restoring grassland and lowering the number of animals that graze there. Academic field research, however, reveals that overgrazing is still occurring and that grasslands are deteriorating in some pastoral areas [11]. These contradictory findings about the effects of China's environmental policies may, in part, be due to differences in the research areas that were researched and the methodologies that were employed. A vast number of researchers based their findings on surveys that were done on a larger scale, while smaller surveys and surveys with long-term observations are typically lacking. Findings may be skewed in the opposite direction if a survey was limited to grasslands that had undergone considerable degradation [12]. In a recent study, Yin discovered empirically that grazing intensity dramatically increased four years after the program's start, based on a survey of 726 Inner Mongolian herder families. They haven't, however, looked into how the programme affects the standard of the grassland. To address these issues, we make use of a sizable panel dataset that spans 15 years and includes the whole pastoral region of Inner Mongolia. Most notably, a simultaneous equation model is used to study the interaction between cattle and grasslands while controlling the temperature, meat pricing, and agricultural activities.

The policies of China regarding grassland are discussed first. The study area is covered in Section 3 while the data are covered in Section 4. Sections 5 and 6 talk about the econometric models and the results they produced. Policy implications are discussed in Section 7. In order to help other countries that are having trouble finding a balance between livestock production and grassland conservation, we've conducted a thorough analysis of SISGC and a thorough examination of China's grassland policy [13-15].

Conclusions

Finding a solution to lessen grassland degradation while sustaining China's explosive growth in meat consumption is of great concern to policymakers. This study investigates the impacts of the Subsidy and Incentive System for Grassland Conservation on cattle output and grassland condition in Inner Mongolia, China. The Normalized Difference Vegetation Index was utilised to assess the condition of the grassland using remote sensing technology.

Conflict of Interest

No conflict of interest declared.

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