

A Study of the Effects of the Grassland Ecological Protection Subsidiary-Award Policy on China's Grassland Ecology

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Abstract. The grassland ecological protection subsidiary-award policy is a new policy, with the largest scale and widest range in China since its foundation. This policy is also expected to be the most important long-term grassland ecosystem protection policy and measurement. From a macroscopic perspective, the effects of the Chinese grassland ecological protection subsidiary-award policy on grassland productivity and ecological protection have been analyzed in this study. The results showed that, since the implementation of the grassland ecological protection subsidiary-award policy, marked achievements have been made in both grassland ecological restoration and natural grassland yields. The theoretical grassland grazing capacities have been increased, and the average livestock overloading capacities of natural grassland have obviously dropped. Also, the comprehensive vegetation coverage of the national grasslands have, as a whole, been on the rise.

Introduction

The Chinese grassland areas account for 44% of the national land area, and the condition of the grasslands not only determines the animal husbandry development of the prairie pastoral areas, but also plays an important role in the national ecological environment construction. However, for an extended period of time, many people have merely regarded the prairie as a provision source of forage grass, while the grassland ecological function value has not been taken seriously. According to the national grassland monitoring report, China's current grassland ecological environment situation is grim, and the ecological environment governance has entered a new crucial stage. Therefore, the Chinese government has developed a series of grassland ecology protection policies, including the returning of grazing land to grassland, the Beijing and Tianjin sandstorm treatment project, and so on. Among these policies, the grassland ecological protection subsidiary-award policy, which was implemented in 2011, is particularly important. This new policy has the largest scale, widest range, and is the most beneficial to herders since China's foundation. The grassland ecological protection subsidiary-award policy has been operating for nearly five years now, and the academic research regarding the Chinese grassland ecological protection policy has mainly focused on the policy's implementation effects and the existing problems. The policy implementation effects are mainly aimed at researching the policy's effects on animal husbandry production and herders' income. Meanwhile, the special study of the policy's implementation effects on the grassland's ecology has been less of a focus. Therefore, based on a macro perspective, the data of the National Grassland Monitoring Report issued by the Ministry of Agriculture from 2006 to 2014 were used in this study to analyze the effects of the grassland ecological protection

subsidiary-award policy on grassland productivity and ecological protection, in order to put forward related suggestions.

Grassland ecological protection subsidiary-award policy and implementation

China's grassland ecological protection subsidiary-award policy was implemented in 2011, with the aims of protecting national ecological safety, promoting the animal husbandry development of pastoral areas, and increasing herders' income. The policy involves Inner Mongolia, Xinjiang, Tibet, Qinghai, Sichuan, Gansu, Ningxia, Yunnan, three northeastern provinces, and the 639 counties of Hebei and Shanxi (including 268 pastoral and semi-pastoral counties). These grassland areas cover 4.8 billion mu, and account for more than 80% of the national grassland area, providing benefits to approximately 2.84 million herders. The annual national financial investment has been nearly 15 billion yuan, in order to implement grassland grazing prohibition subsidies, pasture-livestock equilibrium rewards, and production subsidies for herders.

Effects of the grassland ecological protection subsidiary-award policy on grassland productivity and ecological protection

Natural grassland yield higher than that before the policy's implementation

Following the implementation of the policy, the fresh grass yield of the national natural grasslands showed an increasing trend at first, and then as a whole lowered to above the level before the implementation of the policy. The fresh grass yield increased from 1.0024826 billion tons in 2011, to 1.0558121 billion tons in 2013, and then fell to 1.0221998 billion tons in 2014. Accordingly, the equivalent hay yield showed a consistent change trend as a whole, with an increase from 313.2201 million tons in 2011, to 325.4292 million tons in 2013, and then also fell to 315.022 million tons in 2014.

Average livestock overloading rate of the natural grasslands obviously decreased

The average livestock overloading rate of the natural grasslands declined gradually from 34.00% in 2006, to 15.20% in 2014. In particular, since the implementation of the policy, the average livestock overloading rate of the natural grasslands was found to decrease by 12.8%, with an annual average of 3.2% observed between 2011 and 2014. However, before the policy implementation, the average livestock overloading rate of the natural grasslands showed a reducing trend of 0.8% per year on average. It has been shown that the grassland ecological protection subsidiary-award policy, grazing prohibition, pasture-livestock equilibrium, and other measures which have been taken to greatly reduce the overgrazing of the grasslands have all had positive effects on the grasslands' ecological protection process.

Theoretical grazing capacity of the natural grasslands as a whole higher than previously

Following the policy implementation, the theoretical grazing capacity of the natural grasslands increased from 246.1993 million units of sheep in 2011, to 247.6118 million units of sheep in 2014, which was higher overall than the theoretical grazing capacity from 2006 to 2010 (highest level of 240.1311 million units of sheep). Therefore, in the case of the grasslands' ecology restoration after policy implementation, the natural grassland grazing capacity was found to have been gradually improved.

Comprehensive vegetation coverage of the national grasslands as a whole on the rise

In the annual *National Grassland Monitoring Report*, index statistics were conducted on the comprehensive vegetation coverage of the national grasslands since 2011. Therefore, the comprehensive vegetation coverage status of the national grasslands after

implementation of the policy was analyzed in this study. Overall, it was determined that the comprehensive vegetation coverage of the national grasslands was on the rise, and increased from 51.00% in 2011, to 53.60% in 2014.

In this study, through a comprehensive analysis, it was found that the grassland ecological protection subsidiary-award policy assisted in the recovery of the grasslands' productivity, and was advantageous to the grasslands' ecological protection. However, it should also be noted that the fundamental improvement of the grasslands' ecology will require many years, and China's grassland ecological protection task process is still arduous.

Table 1. National natural grassland monitoring situation from 2006 to 2014

Unit: 10,000 tons, 10,000 units of sheep

Item		Before policy implementation				
		2006	2007	2008	2009	2010
1. National natural grassland productivity	1.1 Fresh grass yield	94313.00	95214.00	94715.50	93840.86	97632.21
	1.2 Hay yield	29587.00	29865.00	29626.80	29363.77	30549.71
2. Average livestock overloading rates of key natural grassland in six major pastoral provinces and China		34.00%	33.00%	32.00%	31.20%	30.00%
3. Theoretical grazing capacity		23161.00	23369.00	23178.00	23098.81	24013.11
Item		After policy implementation				
		2011	2012	2013	2014	
1. National natural grassland productivity	1.1 Fresh grass yield	100248.26	104961.93	105581.21	102219.98	
	1.2 Hay yield	31322.01	32387.46	32542.92	31502.20	
2. Average livestock overloading rates of key natural grassland in six major pastoral provinces and China		28.00%	23.00%	16.80%	15.20%	
3. Theoretical grazing capacity		24619.93	25457.01	25579.20	24761.18	
4. Comprehensive vegetation coverage of national grassland		51.00%	53.80%	54.20%	53.60%	

Data source: annual *National Grassland Monitoring Report*

Conclusions and recommendations

The research results of this study showed that, since the implementation of the grassland ecological protection subsidiary-award policy, marked achievements have been made in grassland ecological restoration, as well as natural grassland yields. Also, the theoretical grassland grazing capacities have been increased; the average livestock overloading rate of natural grassland has apparently dropped; and the comprehensive vegetation coverage of the national grasslands is, as a whole, on the rise.

Continue to increase grassland ecological protection

Due to the seriousness of the ecological damage to China's grasslands, there is a certain distance still to go to achieve a comprehensive recovery of the grassland ecology in the pastoral areas. As revealed by the analysis of the *National Grassland Ecological Monitoring Report* in 2014, the grassland ecology system is not stable, still remains fragile, and is vulnerable to the influences of precipitation and other climate factors, as well as use means. In this study, the following recommendations have been made: First of all, a further expansion of the implementation scope of the national grassland

ecological protection subsidiary-award policy is required; and secondly, an intensification of the promotion should be implemented, in order to ensure the herdsmen truly understand the policy effects on the pastoral areas, attach great importance to the protection of grassland ecology, and actively cooperate with the policy's implementation.

Improve the supporting policies of the grassland ecological protection subsidiary-award

The specific aspects requiring future attention which were identified in this are as follows: 1. Improve the grassland ownership system, clarify unclear grassland ownership, and promote the implementation of the grassland ecological protection subsidiary-award policy; 2. Firmly advance the policy within the grassland ecological protection process, and gradually improve the grazing prohibition and pasture-livestock equilibrium subsidies, in order to prevent overgrazing, and to gradually restore the grasslands' ecology.

Increase efforts to investigate grassland supervision

Establish long-term management mechanism, increase the levy occupation of grassland management, and severely punish illegal acts of reclamation prairie woodland, increase funding for law enforcement personnel, protect the grassland ecological environment and promote sustainable economic development.

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