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Research on the Impact of High - Standard Farmland Construction Policy on Agricultural Green Development

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ABSTRACT

Under the dual pressures of global climate change and population growth, agricultural green development has become a critical path to achieving sustainable agriculture. The High - Standard Farmland Construction Policy has significantly promoted agricultural transformation by enhancing resource utilization efficiency, environmental protection, and economic benefits. However, the policy implementation also faces challenges such as ecological risks and high maintenance costs. Current research mainly focuses on single dimensions, lacking long - term systematic analysis and regional comparisons. Future studies should strengthen interdisciplinary integration, establish long - term monitoring mechanisms, and conduct differentiated impact evaluations to optimize policy design and advance the sustainability of agricultural green development.

KEYWORDS

Agricultural Green Development; Environmental Protection; High – Standard Farmland Construction.

1. INTRODUCTION

In the current global context, the agricultural sector confronts unprecedented challenges. Global climate change, with rising temperatures, erratic rainfall, and more frequent extreme weather events like droughts and floods, severely impacts agricultural production. It leads to reduced crop yields, soil degradation, and water scarcity. Meanwhile, the global population is projected to reach nearly 10 billion by 2050, significantly increasing the demand for food and putting pressure on sustainable agricultural production[1].

Against this backdrop, agricultural green development emerges as a crucial solution for long - term agricultural sustainability. Merely focusing on increasing output is insufficient; integrating environmental protection, resource conservation, and sustainable practices into agricultural strategies is essential. Agricultural green development aims to balance agricultural productivity, environmental sustainability, and economic prosperity.

The high - standard farmland construction policy, adopted globally in countries such as China, the US, and Brazil, is vital for agricultural modernization and green development. For example, China has set ambitious goals for high - standard farmland construction. This policy significantly improves

agricultural productivity, enhances resource utilization efficiency, and safeguards the ecological environment.

The core objective of this study is to comprehensively review existing research on the impact of the high - standard farmland construction policy on agricultural green development. By analyzing relevant literature, we aim to clarify its positive and negative impacts in practice, as well as differences in various regions and production systems. This research is expected to provide theoretical support and practical references for formulating scientific agricultural development strategies[2].

2. THE IMPACT OF HIGH - STANDARD FARMLAND CONSTRUCTION POLICY ON AGRICULTURAL GREEN DEVELOPMENT

2.1. Positive Impacts

2.1.1. Improving Resource Utilization Efficiency

Efficient resource use is fundamental to agricultural green development. High - standard farmland construction contributes significantly in this regard. It promotes advanced irrigation systems like drip and sprinkler irrigation, replacing wasteful flood irrigation. In arid and semi - arid regions of China, after implementing high - standard farmland projects, water use efficiency has increased by up to 40%[3]. These systems deliver water precisely to plant roots, conserving water and reducing pumping energy.

Soil improvement is another key aspect. Deep - plowing and organic fertilizer application improve soil structure and increase organic matter content. In high - standard farmland with regular organic fertilizer use, soil organic matter can increase by 0.1 - 0.3 percentage points over a few years, promoting better root growth and nutrient uptake.

2.1.2. Promoting Environmental Protection

High - standard farmland construction plays a crucial role in environmental protection. Precision agriculture technologies, relying on sensors and satellite imagery, enable farmers to apply fertilizers and pesticides more precisely, reducing chemical inputs and pollution risks.

Moreover, the construction often includes ecological corridor building and wetland protection. Ecological corridors maintain biodiversity by connecting fragmented habitats, while wetlands provide ecosystem services like water purification and soil conservation.

2.1.3. Increasing Economic Benefits

High - standard farmland can significantly boost crop yields. Studies show that major crop yields in high - standard farmland are generally 10% - 20% higher than in ordinary farmland[4]. For instance, in Southeast Asian rice - growing regions, farmers with high - standard farmland have reported increased annual incomes due to higher yields.

It also provides a solid foundation for the green agricultural industry. High - quality products from high - standard farmland are in high demand, especially among environmentally - conscious consumers. Organic agriculture, associated with high - standard farmland, can fetch higher prices, bringing more economic benefits.

2.2. Negative Impacts

2.2.1. Potential Ecological Risks

Despite its benefits, high - standard farmland construction has potential ecological risks. Short - term large - scale land leveling and infrastructure building can damage wildlife habitats, leading to a temporary decline in biodiversity.

Improper construction can cause soil erosion and degradation, especially in hilly areas. Over - use of soil improvement measures like excessive chemical fertilizers can also degrade soil over time.

2.2.2. High Construction and Maintenance Costs

Building high - standard farmland requires substantial capital investment for land leveling, irrigation systems, road construction, and equipment purchase. For some local governments, especially in underdeveloped regions, this is a heavy financial burden.

After construction, continuous maintenance is needed. High maintenance costs for irrigation systems and equipment may limit the long - term sustainable development of high - standard farmland, especially in areas with limited financial resources.

3. PROBLEMS IN CURRENT RESEARCH

Most existing research on the impact of high - standard farmland construction policies on agricultural green development focuses on single aspects, such as water utilization or crop yields. There is a lack of comprehensive research that integrates multiple factors to evaluate the policy's overall impact. Understanding the policy's impact requires considering not only direct production effects but also indirect environmental, economic, and social impacts[5].

Current research is mostly short - term, failing to capture long - term trends. High - standard farmland construction is a long - term investment, and its impact on agricultural green development may change over time. The long - term effects of soil improvement on soil fertility and land - use changes on biodiversity are not well understood. Without long - term research, predicting the future of high - standard farmland and its contribution to green development is difficult[6].

The policy's impact varies across different regions and production systems due to diverse natural and social conditions. However, existing studies lack in - depth comparative analysis. Without such research, formulating targeted policy recommendations for different areas is challenging.

4. FUTURE RESEARCH DIRECTIONS

Future research should adopt a more systematic and comprehensive approach, integrating multiple disciplines like agronomy, environmental science, economics, and sociology. Researchers should consider the complex interactions between factors and analyze the policy's impact from multiple dimensions, including resource utilization, environmental protection, economic benefits, and social impacts.

To address the lack of long - term research, establishing long - term monitoring mechanisms is crucial. Setting up research sites in high - standard farmland areas to track soil quality, water resources, biodiversity, and productivity over time can provide a better understanding of long - term trends and effects.

Comparative research is essential for developing effective policies. Future research should compare the policy's impact in different regions and production systems through case studies. By analyzing differences in implementation and outcomes, researchers can identify best practices and tailor policies accordingly[7].

In conclusion, the high - standard farmland construction policy has a profound impact on agricultural green development. While it brings many positive changes, potential problems need to be addressed. Future research should focus on solving existing research problems and providing a more solid theoretical basis for promoting sustainable agricultural green development.

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