ISSN: 2710-0723

The Impact of Green Finance on Agricultural Carbon Emissions

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Abstract

Agricultural carbon emissions, as a major source of greenhouse gas emissions, have a significant impact on the ecological environment and are a top priority in the battle against environmental protection. The development of green finance not only affects the relationship between the financial industry and agricultural economy, but is also a key factor in achieving sustainable development and achieving the goal of rural revitalization for the whole society. This paper analyzes the impact mechanism of green finance on agricultural carbon reduction to show that the development of green finance can achieve the goal of reducing agricultural carbon emissions by promoting agricultural technology upgrading and achieving the clean, green, and sustainable development of agricultural economy.

Keywords

Green Finance; Agricultural Technology; Carbon Emissions.

1. Introduction

Since the reform and opening up, China's agricultural economic development has achieved huge breakthroughs, feeding nearly 20% of the world's population with only 7% of the world's arable land. However, this production model that prioritizes rapid economic growth over ecological and healthy development has brought serious agricultural environmental problems. From 1993 to 2017, the use of fertilizers and pesticides per unit of cultivated land has increased steadily, consistently exceeding the upper limit of international standards, even reaching more than 30 times that of some developed countries, but the utilization rate is less than half of those countries [1]. As an agricultural powerhouse, China's changing the current agricultural intensive development model will play an important role in addressing greenhouse gas emissions. Dealing with agricultural carbon emissions is a huge undertaking, requiring the input of financial, human, and energy resources at every stage, and financial shortages are the key factor it faces. With the development and improvement of China's green financial market, green financial tools have been innovated, and their variety has increased. Currently, China's green financial tools mainly include green credit, green bonds, green derivative tools (such as options and futures), green stocks, and carbon trading, of which bank green credit accounts for a larger share in financing low-carbon agricultural projects. The development of green finance has an incalculable impact on reducing agricultural carbon emissions. This paper analyzes the impact of green finance on agricultural carbon emissions, as well as the shortcomings and problems in the process of agricultural carbon reduction, and gives corresponding policy recommendations, contributing a modest effort to carbon reduction.

ISSN: 2710-0723

2. Agricultural Carbon Emissions and the Concept of Green Finance and Related Definitions

2.1. Connotation of Agricultural Carbon Emissions

Agricultural carbon emissions refer to a series of carbon emissions caused by energy input, waste disposal and other factors in the process of agricultural production and livestock breeding. These emissions include all kinds of emissions directly or indirectly generated in the process of manufacturing and using agricultural chemicals, as well as in the process of agricultural production, such as rice planting, livestock rumination, etc.

Emissions from natural processes. At the same time, waste treatment will also produce emissions, such as straw burning and animal manure treatment. According to the documents of relevant committees, the greenhouse gases emitted by the agricultural sector are mainly CO2, CH4 and N2O [2]. Tian Yun and linzijuan used the carbon emission coefficient method to estimate the carbon emissions from agricultural production [3]. Dingbaogen and others used the carbon emission coefficient method to calculate the carbon emission of planting industry in the Yangtze River Economic Belt [4]. Taoaixiang found that the main sources of huge carbon emissions from planting industry are the input of various agricultural materials in the production process and land tillage and irrigation [5]. Chenshengtao and other researchers have shown that the carbon emissions of animal husbandry mainly come from the intestinal fermentation produced by livestock in the process of livestock breeding and the large amount of methane emissions produced during fecal treatment [6].

2.2. The Concept of Green Finance

The Superfund Act issued by the United States in 1980 first proposed the concept of "green finance", which emphasized that financial institutions should shoulder the responsibility of environmental protection in the process of credit financing. Salazar first expounded his understanding of green finance and mentioned that environmental finance is a financial innovation generated by the demand for environmental protection. It can serve as a bridge connecting finance and environmental industry. Green finance is a business scope of Finance and has a positive effect on the environment [7]. Labat pointed out that as a financial tool, green finance can improve the ecological environment and disperse environmental risks through the power of market mechanism [8]. Sachs and others believe that green finance, through the innovation of financial instruments and the guidance of policies, continuously promotes the fund to lean towards green projects, promotes economic growth and has a friendly impact on the environment, which plays a role in promoting sustainable development [9]. Gaojianliang, an early domestic scholar, pointed out that green finance is a development strategy, which requires the financial industry to always keep environmental protection in mind and adhere to sustainable development in business operations, so as to achieve coordinated development of Finance and economy [10]. Then panyue mentioned that green finance is the support and responsibility of financial and capital markets in environmental governance in their unique way [11]. Based on the above literature research, green finance should be defined as a financial service, and its service scope mainly includes environmental governance, improvement of ecological climate change, promotion of industrial upgrading, technological innovation, risk prevention, etc. As some scholars have studied, green finance also emphasizes a responsibility for environmental protection. Only by implementing the responsibility in the development planning and business scope of each social subject, can we better develop the economy and realize the sustainable development of the whole society.

ISSN: 2710-0723

3. The MainPath of the Impact of Green Finance on Agricultural Carbon Emissions

3.1. Green Finance Optimizes Rural Industrial Structure and Promotes the Process of Agricultural Modernization

The government has issued certain policies and measures in combination with local characteristics and current situation to encourage the development of social resources to green and environmentally friendly clean industries, and called on and guided financial institutions to innovate the tools and systems of green finance, curb the source of funds for enterprises with serious pollution, and force enterprises with high energy consumption and high pollution to upgrade their industrial structure. With the support of green financial funds, green agriculture has achieved unprecedented development, and continues to lead the transformation from small-scale agriculture to green new agriculture. The support of green financial funds is conducive to the expansion of the scale of new agricultural operators and further promote the transformation of agricultural economy. We should expand the green financial market to all links in the process of agricultural production, effectively serve agriculture with green finance, play the role of market players for agricultural carbon emission reduction, and promote the process of agricultural modernization.

3.2. Green Finance Promotes the Development of Agricultural Low Carbon Technology

Agricultural technology innovation is the key factor to achieve carbon emission reduction. Its technological innovation covers a wide range of fields, including ecological planting, recycling of agricultural and sideline wastes, and cultivation of high-yield and low-carbon crops. The investment of green credit in this technology has played an inestimable role in the development of low-carbon agriculture. Nowadays, by testing the texture and type of soil and matching different compound fertilizers, China can adjust the growth environment of crops in a directional way, reduce energy waste and improve the effect of fertilizers. Through the upgrading of agricultural technology, China has adopted efficiency enhancing technologies to reduce and increase efficiency, which has been strongly supported and promoted by the government. In recent years, the use of chemical fertilizers and pesticides has almost achieved zero growth, which has achieved a huge breakthrough compared with the rapid growth from 1997 to 2013. The innovation of low-carbon pest control technology not only reduces the cost of pest control, but also promotes the healthy growth of grass and trees to reduce carbon emissions. Green credit will invest part of the funds in the field of crop variety research, breeding and promotion of low-carbon and high-yield crops, realizing the agricultural development mode of low investment and high yield, so as to further reduce agricultural carbon emissions.

3.3. Green Credit Support for Agricultural and Sideline Crops Recycling

In the process of agricultural production, in addition to the collection of agricultural products, agricultural and sideline crops are treated with waste. In this process, it not only increases the workload for people, but also has a certain impact on environmental pollution. For example, straw is one of the main wastes in agricultural production. In recent years, under the guidance of green credit from banks and the support of government policies, the number and scale of straw recycling sites in rural areas have been increasing. They obtain operating funds and machinery and equipment purchase costs through low loan interest rates. In the process of straw treatment, straw can not only be collected to produce biogas, but also the waste biogas slurry and biogas residue can be used as raw materials for fertilizer production, reducing the

ISSN: 2710-0723

cost of waste treatment, and promoting the effect of agricultural carbon emission reduction through the recycling of agricultural and sideline crops.

3.4. Green Credit Guarantee Fund to Promote the Recycling of Livestock Manure

Animal husbandry is also one of the important sources of greenhouse gas emissions in China, accounting for about 1/3 of the total emissions. In recent years, China has actively taken a series of measures to accelerate the resource utilization of livestock manure, and the policy guidance has accelerated the innovation of green financial instruments. Some large-scale animal husbandry and breeding industries set up professional cooperatives and took large amounts of funds as green credit guarantee funds. Through the innovation of green financial instruments and the establishment of agricultural green credit guarantee fund, we can improve the risk sharing mechanism, reduce the risks in the process of agricultural production, and promote the good development of agricultural economy. According to the application of farmers and the scale of farms, some local banks have enlarged the loans to farmers at a certain proportion and issued loans at a very low interest rate. The interest rate level fluctuates within a small range of the benchmark interest rate to support and encourage farmers to purchase clean production equipment, further promote the "clean" and "green" development of agricultural economy, and play a positive role in reducing agricultural carbon emissions.

3.5. Green Finance Improves the Level of Risk Prevention

The environmental protection and energy conservation industry has the characteristics of high risk in the early stage of development, especially when technology research and development and industrial upgrading, relying only on its own funds and bank loans for R&D and production often bears a greater risk. Through some green financial instruments, such as issuing bonds, stocks and other financial products financing, this risk can be reduced, and the abundant funds are more conducive to the expansion of the scale of the clean industry. Some financial derivatives, such as futures, options and bulk commodity trading, can also provide opportunities for green agriculture to realize risk hedging and lock in risks.

3.6. Green Finance Provides Mortgage Financing Services Related to Agricultural Carbon Emission Reduction

In recent years, the government has given strong support to the development of green agriculture, which has also become an opportunity for the development of green finance. Some financial institutions carry out accounts receivable pledge financing in combination with the financial subsidy policy, and issue certain loans to animal husbandry and breeding companies based on the financial subsidies for government project construction to provide financial support for the construction of new energy power generation projects. Financial institutions are also innovating and actively carrying out pledge financing services for the usufruct of biomass power generation. In this way, support downstream enterprises to transfer land and establish a demonstration area for the use of biogas fertilizer, so as to drive the transformation of agricultural production mode and play a positive role in agricultural carbon emission reduction. This mortgage financing mode greatly meets the capital demand of the development mode of green agricultural production chain, and greatly promotes the development of green agriculture.

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4. Deficiencies in the Process of Green Finance Promoting Agricultural Carbon Emission Reduction

4.1. Slow Development of Green Finance in Agriculture

In recent years, due to the implementation of national policies and changes in the economic development situation, green finance has achieved unprecedented development, and the research on green finance has become increasingly rich. Through reading the relevant literature, we know that green finance has a significant role in promoting the change of industrial structure, technology upgrading and scale expansion of polluting enterprises. Its development can make the industry clean and green, and has a friendly role in promoting the ecological environment. But at present, the green financial market is mainly aimed at the industrial field, and there is still a lack of pilot and operation methods related to the agricultural field. The general economic development of industrial cities is better, and the development of green financial market is also relatively mature. Relatively speaking, the general economic development of cities dominated by agriculture is slightly slow, and the development of green finance is not perfect, and it can not be connected with agricultural production. The development of urban economy is also an important reason for the slow development of green finance in the field of agriculture.

4.2. Insufficient Government Policy Guidance

At present, the implementation of the government's policies after they were issued is not very ideal, but more on the surface of the document. Agriculture is a unique field of economic development. Agriculture is the livelihood of the people, and the people are disadvantaged groups; Agriculture accounts for a large proportion in the industry. If it is separated from agriculture, it will lead to a food crisis. It can be seen that the demand for agriculture is very large, and the purchase of agricultural tools, machinery and equipment, and agricultural fertilizer also requires a large amount of money. For the purchase of large equipment, the government's policy support is not enough, and some old, old, high-energy consuming equipment cannot be updated, which will have a negative impact on environmental pollution and the use of resources.

4.3. Weak Awareness of Green Environmental Protection of Agricultural Operators

Most of the agricultural operators are small and scattered self-employed. These small-scale and unorganized agricultural operators are often unable to follow the government's policies and implement the government's policies into specific business activities. They often continue the traditional agricultural business model, use traditional agricultural tools, and cannot connect the traditional mode of production with green, clean and environmental protection. For some remote agricultural areas, the lack of outlets of financial institutions, the slow transmission of green environmental protection policies, and the lack of knowledge about green finance in the agricultural field make it impossible to fully apply green financial tools to agricultural practice.

5. Suggestions

5.1. Improve the Innovation and Service of Green Financial Instruments

As mentioned above, the services of green finance are more invested in the industrial field, and the green financial services in the agricultural field are insufficient. We should improve the service strength and scope of green finance in the agricultural field, and play a positive role in the clean development of the economy in the agricultural field. We should increase the innovation and development of green financial instruments. At present, the innovation situation of green financial instruments in China has been further developed, but the innovation

ISSN: 2710-0723

of green financial instruments in agriculture still needs to be improved. The source of funds in the field of agriculture largely depends on the green credit of banks in a single form. We should increase the innovation of financial instruments, expand green finance to serve the agricultural market, and further achieve the effect of agricultural carbon emission reduction.

5.2. Strengthen the Implementation and Supervision of Government Policies

The government plays an important role in the national economic operation. To solve the problem of agricultural carbon emissions, the government should play a leading role. It is not only the policy maker, but also the manager and supervisor in the process of policy implementation. Strengthen the publicity of the application of green finance in the field of agriculture, lead agricultural operators to enjoy the preferential policies of the state, change the traditional business philosophy, lead the transformation of agricultural economic development mode to "green" and "clean", and let the main body consciously play its due role in the issue of agricultural carbon emission reduction.

5.3. Strengthen Farmers' Subject Consciousness of Green Environmental Protection

The battle of environmental protection is like the battle against poverty. It can not be solved overnight, nor can it be won only by the efforts of the government or green financial institutions. To solve the problem of agricultural carbon emissions requires everyone's efforts. Both governments, financial institutions and farmers need to make their own efforts to put carbon emission reduction in mind and integrate it into every detail of agricultural production. If necessary, farmers can be trained in green planting, breeding and production, strengthen farmers' awareness of environmental protection, learn new agricultural technologies, and apply them to production, so as to realize the transformation of agricultural production mode to modernization, greening and cleaning. Then the solution of agricultural carbon emission reduction is just around the corner.

6. Conclusion

The issue of agricultural carbon emissions is an environmental and climate issue that needs to be solved urgently, and a consensus has been reached on a global scale. In this context, China has bravely taken great responsibility and issued a series of governance policies, which has made great contributions to strengthening the construction of ecological civilization and environmental protection. As a large agricultural country, in order to develop the agricultural economy better and faster, we should take the innovation of agricultural technology as the driving force, establish a green agricultural industry system, and constantly expand the development of green financial market. Connect green finance with agricultural production, let green finance better serve agriculture, drive the healthy development of agriculture, at the same time, achieve better green finance in the agricultural field, continue to develop the green financial market, and achieve a real win-win situation.

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