

Research on Sustainable Development of Agricultural Industrialization in Western China under the Background of Carbon Neutrality

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Abstract

As the ecological barrier of the Yellow River and Yangtze River economic belts in China, the economic development and ecological environment quality of the western region are directly related to the long-term and stable development of Chinese social economy. The particularity of western agricultural economy also determines the importance of insisting on the development of western agriculture industrialization. Taking carbon neutrality as the research background, this paper discusses the sustainable development path of agricultural industrialization in the western region. First, it shows the role of carbon neutrality in the sustainable development of agricultural products by analyzing the necessity of carbon neutrality strategy. Its impact on agricultural development, as well as the main problems currently faced by western agriculture, namely insufficient application of science and technology, insufficient production efficiency; decentralized production, lack of scale effect; traditional business philosophy, difficult to exert unique advantages; lagging market development, regional cooperation. There are shortcomings. Finally, corresponding suggestions are put forward in response to the above problems, applying advanced technology to develop smart agriculture; promoting the construction of agricultural industrialization clusters; developing characteristic agriculture according to local conditions.

Keywords

Carbon Neutrality; Agricultural Industrialization; Sustainability; Regional Cooperation; Smart Agriculture.

1. Introduction

In September 2020, General Secretary Xi Jinping announced at the 75th United Nations General Assembly that China's carbon dioxide emissions will peak in 2035 and strive to achieve carbon neutrality by 2060. Carbon neutrality and carbon peaking are usually closely related to industrial and energy structural adjustment. However, the promotion of carbon peaking and carbon neutralization is inseparable from the improvement of the agricultural system. The carbon emissions generated in the process of agricultural planting and breeding are not at the same level as those of high-energy-consuming industries such as industry, but the premise of high agricultural yield is input. Sufficient use of fertilizers and pesticides not only endangers

dietary safety, but also accompanies energy consumption and greenhouse gas emissions. In addition, due to the low efficiency of agricultural irrigation water use and bad agricultural practices such as straw burning, it constitutes the main source of carbon emissions. Agricultural industrialization is an innovative model to solve the main contradictions of current agriculture, and it is also a major innovation of the business model in the process of Chinese agricultural transformation from traditional agriculture to market-oriented agriculture. It is of great practical significance to develop agricultural industrialization in economically underdeveloped areas in western China. It is more conducive to improving the overall level of Chinese agricultural modernization and marketization, further optimizing the industrial structure, and promoting the economic development of the western region.

In the western development strategy, the western region includes 12 provinces, covering an area of 6.85 million square kilometers, accounting for 71.4% of Chinese total area, of which the cultivated land area is nearly 70,000 mu, accounting for 37% of Chinese total cultivated land area. The western region also includes grasslands, forests and other resources suitable for biological growth. In addition, the western region has sufficient water resources, and the total water resources in 2020 will reach 16 trillion cubic meters, which is nearly 60% of the national water resources. These abundant resources have laid a good foundation for agricultural development to a certain extent, but the distribution of resources is uneven, the geographical distribution of natural resources varies greatly, and the process of agricultural industrialization is relatively slow due to talents and funds. However, the western region has natural advantages in terms of terrain and climate. Due to the lack of systematic and standardized management methods, its industrial benefits and the development of industrial sectors are limited. Therefore, the development of agricultural industrialization in the western region will realize the transformation of its agricultural modernization and industrialization. Green transformation is the best choice for agricultural development.

2. The Necessity to Implement a Carbon Neutral Strategy

2.1. Serious Waste of Resources

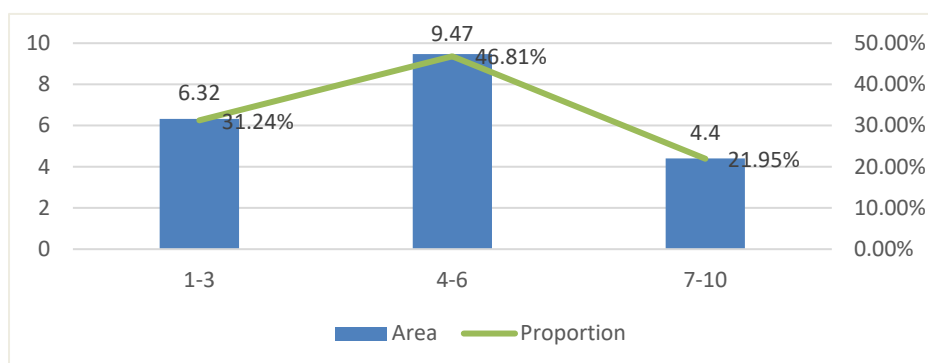


Figure 1. Current situation of cultivated land quality in China

At present, there is a serious waste of social resources. Taking agriculture as an example, due to the improvement of the level of mechanization, the traditional intensive farming mode has gradually withdrawn from the historical stage. In order to reduce labor costs and time costs, farmers destroy a large number of biological materials and pollute cultivated land. As shown in Figure 1, a considerable proportion of Chinese cultivated land is of poor quality. Straw burning pollutes the environment. As the main agricultural and sideline products, straw burning not only pollutes the environment, but also wastes biological resources, reduces the productivity of arable land, and increases greenhouse gas emissions. Although excessive fertilization increases soil fertility, under the scouring of rain, a large number of chemical fertilizers flow

into rivers and lakes, resulting in negative effects such as physical eutrophication. In addition, many farmers blindly increase the sowing scale of crops and increase the number of sowings. Some farmers even directly scatter seeds together with chemical fertilizers. Under the rotary tillage method, crops will not germinate completely, which will not only waste seeds but also reduce income.

2.2. The Ecological Environment Continues to Deteriorate

Ecological environmental pollution mainly includes water pollution, air pollution and soil pollution. According to the Xinhuanet report, in the continuous monitoring data of 118 cities in China, about 64% of the urban groundwater is seriously polluted, 33% of the groundwater is slightly polluted, and only 3% of the groundwater is of good quality. About 150 million mu of land in China, more than 10% of the land is classified as heavy metal pollution. In addition, as shown in Figure 1, in the air quality results of 337 cities above the prefecture level in China, nearly 20% of the cities have been affected by air quality. This shows that Chinese ecological environment pollution situation is bad, not optimistic.

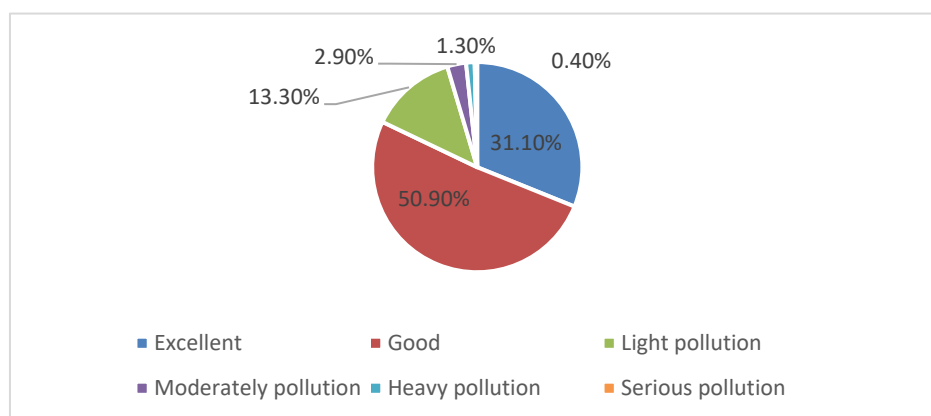


Figure 2. The environmental quality of 337 Chinese cities above the prefecture level in 2020

2.3. The Urgent Need for Sustainable Development

At present, the issue of energy shortage and environmental pollution has become the focus of global attention. How to transform the traditional high energy consumption and high pollution economic growth force, improve energy conservation and emission reduction capabilities, develop a low-carbon economy with low emissions and low energy consumption, and achieve economic sustainability Development has become a common means of improving one's own economic strength. As a large developing country, The energy and environment contradictions of China are more prominent. As a major energy-consuming country, the United States consumes nearly 30% of the world's energy with 6% of its population, while Chinese population is several times that of the United States, and its energy consumption is even greater. Under the premise of lack of innovation, environmental degradation and energy shortage will reduce resources to Chinese future economy. developing. The development of low carbon and the promotion of "carbon neutrality" have become an important prerequisite for reducing energy consumption, promoting economic circular development, and building socialist harmony. It is also an innovation in production methods and values.

3. The Impact of Carbon Neutrality on the Development of Agricultural Industrialization

3.1. The Impact of Carbon Neutrality on the Development of Agricultural Industrialization

The proposal of the carbon neutrality plan imposes strict requirements on reducing greenhouse gas emissions. This will greatly reduce non-standard agricultural behaviors such as straw burning and low nitrogen utilization rate, and further improve the level of refinement in order to increase crop yields. That is to prompt people to adopt high-tech technology in agricultural production, to avoid a large amount of input of fertilizers and pesticides while increasing the yield of crops. It mainly includes AI intelligence and automation, drones, sensors, etc. These agricultural technologies can not only improve the efficiency of resource use, but also realize the advantages of agriculture such as "environmental monitoring, process control, and quality traceability", and promote the refinement of the agricultural industry production.

3.2. Promote Renewable Energy and Apply Energy-saving Agricultural Machinery

In order to reduce carbon emissions and accelerate the process of carbon neutrality, renewable energy has become the main force in agricultural production. In the increasingly mature technology, the application of energy-saving agricultural machinery will also emerge as the times require. With the introduction of relevant national policies and the strong support of science and technology, the common problems of comprehensive utilization of straw and rural waste will be answered one after another. Agricultural mechanization is not only an important material prerequisite for the development of modern agriculture, but also a key carrier and an important means for the recycling of rural waste and renewable energy. Through the realization of agricultural mechanization, the mechanized return of straw to the field and mechanized farming, etc., an innovative development model of agricultural resource utilization and cleaning with regional characteristics has been gradually formed. Carbon neutrality and carbon peaking have a positive impact on the promotion of renewable energy in certain Chengdu Provinces, and further accelerate the process of agricultural industrialization.

3.3. Strengthen Environmental Protection Publicity and Control Environmental Pollution

In recent years, Chinese economy has entered a period of high-quality development, and the transformation of the economic structure will alleviate the contradiction between the economy and the environment to a certain extent. However, although the environmental pollution index has declined in 2020, the situation is still not optimistic, and the vigilance of environmental protection propaganda cannot be relaxed. Under the "dual carbon" plan of carbon neutrality and carbon peaking, Chinese environmental protection propaganda has been greatly enhanced in recent years, and the pace of environmental protection related fields has been accelerated. The carbon peak direction changes. The proposal of carbon neutrality plan not only has positive significance for reducing carbon dioxide, but also strengthens environmental protection propaganda, and environmental pollution will be effectively controlled, which has important practical significance for industrial structure upgrading and agricultural industrialization.

4. Problems Faced by the Development of Agricultural Industrialization in the Western Region

4.1. Insufficient Application of Technology and Insufficient Production Efficiency

Agricultural industrialization needs to be supported by science and technology. General Secretary Xi Jinping once pointed out that "the way out for agriculture lies in modernization, and agricultural modernization requires technological upgrading." The development of agricultural industrialization is inseparable from the investment and application of modern technology. A necessary prerequisite for productivity. However, due to natural limitations, lack of economic strength, political culture and other factors, the agricultural industrialization in the western region is not closely connected with science and technology, which is far from that in the eastern region of China, and some western regions still use animal labor. According to statistics, the average level of agricultural labor in the 12 western provinces is only 0.3, which is less than one-sixth of that in the eastern provinces with the highest agricultural productivity. In addition, due to the backward education level in the western region and other reasons, there is a lack of agricultural technical talents, farmers' scientific and technological literacy is even lower, and the application of science and technology has been at a backward level for a long time.

4.2. The Land System is Backward, and the Large-scale Operation of Agriculture is Limited

When agricultural mechanization spreads on a large scale, small-scale household agricultural production and management based on the household contract responsibility system has become the main obstacle to agricultural industrialization in the western region. Under the land management mode of the household contract responsibility system, farmers are less motivated to invest in land capital and technology, the efficiency of land output declines, and the promotion of modern agricultural production methods is limited. In addition, some land systems provide convenience for farmers to transfer land, which is not conducive to the process of large-scale agriculture to a certain extent. Dual household registration and differentiated social security systems have prompted a large number of farmers to go out to work, resulting in a huge amount of land circulation and a long cycle, which seriously affects the level of land use. The complex terrain in the western region leads to high operating costs, making farming difficult. , poor control liability.

4.3. The Business Philosophy is Traditional, and the Characteristic Advantages are Difficult to Exert

The agricultural products in the western region are rich and have regional characteristics. To sum up, there are three kinds of characteristic agriculture in the western region, namely seed production, cattle raising and vegetable industry. Such as wool and beef from Xinjiang, Tibet, Gansu and other places, cotton, tobacco and alcohol from Xinjiang, Yunnan and Guizhou and other places, dairy products from Inner Mongolia, meat products and hot pot ingredients from Sichuan and Chongqing, etc. The problems existing in its characteristic industries are concentrated in that farmers have limited access to the market, leading enterprises have failed to play a good leading role, the industrial structure is still in its infancy, and the loose and extensive traditional production model is still in a dominant position. The advantageous agricultural products in the west have not yet formed a brand, and the traditional business model in the west has led to an increasingly unbalanced interest relationship between towns, villages and rural areas.

4.4. The Market Development is Lagging Behind, and Regional Cooperation has Shortcomings

There are differences in the administrative interests and economic interests among the administrative subjects in the 12 western provinces, and the selection of cooperation projects is also different. Some provinces have cooperation barriers, such as the collection of delivery fees and overtime admission fees, which seriously affect the regional economy. cooperation between. In addition, agricultural cooperation in some western regions is in its infancy, mainly based on bilateral cooperation and less and more variable cooperation. There are corresponding plans and programs for the form and content of cooperation, and it is easy to cause unclear cooperation goals and cooperation priorities. The blind cooperation or repeated cooperation can only bring the result of one plus one less than two in the end. Finally, brand agriculture plays a leading role in agricultural industrialization, and cultivating a group of brand agricultural enterprises has a strong leading effect on the development of the agricultural economy in the western region. However, in the construction of agricultural brands, the western region lacks a corresponding cooperation mechanism. Many local famous brands, although The quality level is high, but due to the lack of cooperation with other provinces and other reasons, the cost of entering the foreign market is high, which not only increases the operating cost of enterprises, but also damages the interests of consumers.

5. Strategies for the Sustainable Development of Agriculture in the Western Region

5.1. Apply Advanced Technology to Develop Smart Agriculture

The government should increase investment in scientific and technological research and development, use technology to promote the upgrading of agricultural industry results in the west, increase financial support for agricultural scientific research projects, and promote the realization of agricultural scientific and technological innovation achievements. Talent introduction, preferential policies for such talents, welfare benefits for front-line agricultural science and technology research and development personnel, and enhancement of the transformation of agricultural science and technology achievements. Finally, expand scientific and technological cooperation and establish an agricultural science and technology extension system. According to market changes, service agencies such as intermediaries are used to connect scientific and technological innovation with modern agricultural production and operation, and to enrich and improve the interest linkage system of the agricultural industry chain.

5.2. Innovative Land System Reform

We should adhere to the premise of collective ownership of land, and actively explore for the opening of management rights. In the process of deepening the reform of the rural land system, we will continue to standardize the market-oriented management system for high-quality cultivated land in the west. Do not change the collective nature of rural homesteads and collective commercial construction land, improve their circulation and contracting, develop the quality of the emperor, saline-alkali land and tidal flats and other listed land, strengthen the legitimate rights and interests of the operating entities, and encourage more farmers to invest in improvement. Soil quality, improve land fertility, and build supporting farming facilities to improve the agricultural production environment.

5.3. Develop Characteristic Agriculture According to Local Conditions

The western characteristic agriculture needs to highlight the environmental characteristics, highlight the characteristics of no pollution or light pollution of the land, and have an ideal

environment for green production. Secondly, highlight the characteristics of species resources and develop precious, rare, famous and unique agricultural products. The rich natural resources in the west make it a strong support for the development of characteristic agriculture. Species resources should be rationally developed, and resource advantages should be transformed into competitive advantages to meet the diversified needs of the market. Highlight climatic characteristics, highlight off-season products through climate advantages, and cultivate unique agricultural products together with local land and water resources to attract the market. Highlighting national characteristics, there are many ethnic minorities in the western region, and the eastern and central regions have increased demand for halal food with the diversification of consumer demand. From the perspective of characteristic agriculture, ethnic characteristics are their strong support.

5.4. Promote the Integration of Regional Cooperation into the Economic Cycle

To promote regional agricultural cooperation, it is first necessary to strengthen the cooperation and innovation mechanism of opening up in the western region. Two or more provinces jointly set up experimental projects for agricultural openness and cooperation, and establish a leading group to focus on and coordinate important issues of agricultural regional cooperation, and to supervise the implementation of the project. . Secondly, the western provinces should build the interconnection of talents, capital and technology, so as to achieve the complementary advantages of agricultural scientific research projects, promote the reciprocal sharing of agricultural scientific and technological achievements, and promote and disseminate agricultural science and technology on the same network platform. It is also necessary to promote the sharing of agricultural human resources in two or more provinces, as well as the mutual communication and exchange of agricultural information and early warning mechanisms related to agricultural products. Finally, the real quality and safety monitoring results of agricultural products should be mutually recognized, so as to reduce the barriers to cooperation and improve the opportunities for agricultural cooperation between the two sides.

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