



Research Article

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## Transformation of the economic development mode of agriculture under the low-carbon economy background

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### ABSTRACT

*With increasingly growing attention being paid to low-carbon economy in recent years, it has become a new trend of the current times. Influenced by the low-carbon economy, the modern agricultural development mode is gradually transformed into the one of sustainable development. Therefore, it is necessary to analyze industrial characteristics of the agricultural economy under the modern low-carbon economy background so as to explore the realistic problems of the low-carbon agricultural economy and further improve the agricultural development mode in our country.*

**Key words:** Low-carbon economy; agricultural economy; development mode; transformation

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### INTRODUCTION

As a new economic mode based on low-pollution, low-emission and low-consumption, low-carbon economy can handle the relationship between economic development and environmental protection in a proper way, which conforms to the fundamental requirements of the harmonious development, scientific development and sustainable development in our country. In retrospect of the recent years of development in our country, economic growth is realized at the cost of environment pollution. With the enhancement of the awareness of environment protection, the economic development mode also requires some adjustment. Nevertheless, the study of low-carbon economic development is mainly about urbanization and industrialization, with the focus on solving the environmental problems triggered by industrial emission and consumption, whereas no sufficient attention has been paid to the significance and urgency of the combination between low-carbon economy and the agricultural economic development.

With the sustained development of agricultural economy and the acceleration of industrialization and urbanization in rural areas, marked achievements have been made in agricultural water conservancy, mechanization, electrification and chemical application. As rural areas have increasingly greater demands for fossil energy resources, pesticides, chemical fertilizers and herbicides, it is impossible to make pollution-free disposal of industrial and household refuse. With the development of agricultural economy, there is also a ceaseless increase of carbon emissions. Therefore, the agricultural economy should also adopt a low-carbon development mode and pursue a modernized development path characterized by low pollution, low consumption, low emission, low input and high yield.

### 2. THE SIGNIFICANCE AND URGENCY OF TRANSFORMING THE ECONOMIC DEVELOPMENT MODE OF AGRICULTURE

With the sustained growth of agricultural economy in our country nowadays, it is vital to fully realize the increasingly acute environmental problems and scarce agricultural resources. Yet many difficulties and challenges are confronting us in the transformation of the development mode of our country's agricultural economy. Against the backdrop of low-carbon economy, such a transformation should take into sufficient account of the national conditions of our country. Just as the following figure illustrates:

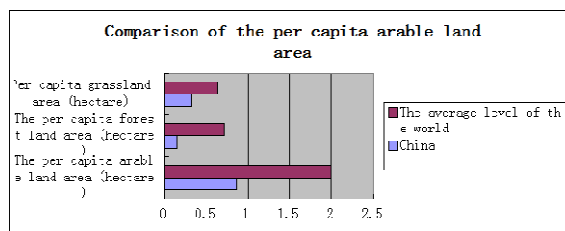


Fig. 1: Comparison of the per capita arable land area

Our per capita arable land, woodland, grassland area are lower than the world average levels, accounting for their 40%, 25% and 52%. And there is a great gap between the grain yield per unit in our country and the global leading level whereas pesticide, farm film and fertilizer used per capita arable land exceed the world average level. In light of the particular conditions in our country, we should learn from beneficial experience from other advanced countries and gradually transform the economic development mode against the background of low-carbon economy.

Building the production structure of low-carbon economy and establishing the idea of low-carbon economy can facilitate innovation of the technology structure, energy structure and consumption structure, lay the basis of a scientific, efficient and low-carbon economic development mode of agriculture, promote various modes like ecological agricultural economy, circular agricultural economy, organic agricultural economy and modern sightseeing agricultural economy and accelerate a comprehensive transformation of the economic development mode of agriculture.

### 3. ANALYSIS OF THE FUNCTIONS AND CHARACTERISTICS OF AGRICULTURAL ECONOMY AGAINST THE BACKDROP OF LOW-CARBON ECONOMY

#### 3.1 Function analysis of low-carbon agricultural economy

Various kinds of carbon emissions can be produced during the agricultural production. For example, fossil energy resources will be consumed during the preparation of production materials, the growing of crops and the harvest of agricultural products, thus resulting in carbon emissions; electricity and other energy resources will be consumed during the preparation of production materials, the processing of crops and fertilizers and the reprocessing of agricultural products, thus leading to carbon emissions indirectly. Moreover, the disposal of agricultural wastes will also result in the emission of a large quantity of carbon. At present, the government has formulated a special plan of treating agricultural wastes with a view to reducing the emission of greenhouse gases. To sum up, during the development of agricultural economy, each link is associated with low-carbon economy. Therefore, to further perfect the development of agricultural economy at the mode of low-carbon economy, emission reduction and appropriate control of the agricultural production process should be involved in all the links so as to meet the requirements of low-carbon economy.

#### 3.2 Characteristics of agricultural economy under the low-carbon economy

Low-carbon agricultural economy should be strongly innovative, which can meet the demands of energy conservation, environmental protection and high efficiency and make full use of renewable energy resources and reduce the input of fossil energy resources to realize cyclic utilization. Besides, it also should be safe and sound so that each link of the agricultural production process has lower pressure on the social economy and does less damage to the environment. To make agricultural economy innovative and secure, our agricultural economy should set stone in the use of advanced agricultural production technologies. Just the following figure demonstrates:

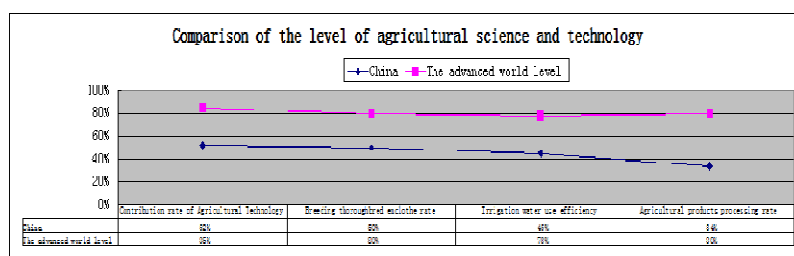


Fig. 2: Comparison of the level of agricultural science and technology

There is still a great gap between the agricultural technology level of our country and the leading level of the world, with the processing rate of agricultural production showing the biggest gap. Such a phenomenon is caused by the failure to effectively enhance the agricultural technology contribution rate. Therefore, during the transformation of

the economic development mode of agriculture, we should strengthen the utilization of advanced agricultural technologies so that low-carbon agricultural economy can grow on the basis of low consumption, low carbon and high efficiency so as to meet the general demands of developing the low-carbon economy.

#### 4. REALISTIC PROBLEMS OF THE DEVELOPMENT MODE TRANSFORMATION OF LOW-CARBON AGRICULTURAL ECONOMY

##### 4.1 Incomplete infrastructure and poor innovation

As a traditional industry, the agriculture in our country has a long history. Due to the high dependency on the industry for a long time, the agricultural infrastructure is not complete, which leads to few fixed assets investment, incomplete water conservancy facilities and poor economic benefits of the land. Moreover, because the majority of infrastructure is poorly maintained, the agricultural productivity is undermined. Apart from incomplete infrastructure, another important factor restraining the development of our agricultural economy are insufficient innovation ability and poor management mode. The traditional agricultural production mode is adopted in the majority of areas in our country, where no full use is made of agricultural technologies, agricultural mechanization is not implemented on a large scale and farmers have poor knowledge of science and technology. The backward agricultural technology and the poor management of farmland by agricultural scientific and technological personnel have adverse impacts on the transformation of the economic development mode of agriculture.

##### 4.2 Inappropriate utilization of resource and the decline of the safety index of agricultural products

The biggest restraint of the development of our agricultural economy is the contradiction between production demand and the current condition of resources. To make things worse, with a large population and an overt pace of industrial development, the contradiction between the excessive population and finite land resources is intensifying. Nevertheless, such a finite arable land is not properly utilized and much arable land is wasted, which lead to accelerating land desertification and deterioration. The deteriorating ecological environment then leads to the low rate of sustained utilization of land resources and thus many realistic problems like grassland deterioration and water loss and soil erosion. To make things worse, the ceaseless growth of the industry also exacerbates environmental destruction in that the increase of industrial waste gases has severely polluted land and water resources. As the farmland is polluted, the yield of crops also declines, which is unfavorable to the development of our agricultural economy.

#### 5. OPTIMIZATION OF THE DEVELOPMENT MODE OF LOW-CARBON AGRICULTURAL ECONOMY

##### 5.1 Developing the modern circular economy and effectively integrating the agriculture, forestry, animal husbandry and fishery

The development of modern agricultural economy should conform to four principles: strictly controlling pollution, recycling resources utilization, improving the recycling level and reducing resources input. During the agricultural production, all the means of production should be made full use of so as to enhance the utilization efficiency and strengthen the recycling utilization mode. In addition, during the process of recycling, we should prevent bringing into hazardous substance, and establish the industry chain from agricultural resources to agricultural products and finally to the secondary utilization of agricultural wastes so as to coordinate the relationship between the development of agricultural economy and the ecological relationship to the maximum.

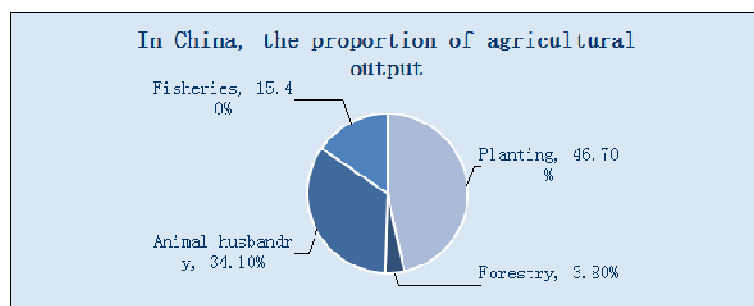


Fig.3: the proportion of agricultural output

The proportion of these industries to the total is not reasonable, therefore the structure of our agricultural production should be perfected so as to strengthen the protection of the ecological development. Moreover, the development mode of circular agricultural economy should be adopted to increase the economic benefits of agricultural economy on the basis of low consumption and emission. Therefore, the connotative transformation of the economic development mode of agriculture is made to alleviate the pressure on ecological environment and solve the issue of the shortage of land resources.

### 5.2 Promoting the technology of agricultural economy and applying the advanced cultivation method into practice

The economic development mode of agriculture should adapt to the low-carbon pattern. To be specific, the agricultural infrastructure should be perfected, modern managerial methods should be more vigorously applied into the development of agricultural economy and talents with specialized agricultural skills and advanced managerial techniques should be trained so as to further promote agricultural mechanization and strengthen the application of information technology in agriculture. Moreover, advanced farming methods should be adopted, and farmers should be taught about the knowledge of agricultural science and technology and its application. Besides, while guaranteeing land benefits, we should strengthen the coordination between resources utilization and agricultural productivity, explore the potential of agricultural economy and develop the organic agriculture, green agriculture and sightseeing agriculture. Finally, we should effectively integrate agricultural economy, social development and ecological environment to strengthen economic values during the exploitation so as to accelerate the transformation of the economic development mode of agriculture and enhance the competitiveness of our country's agriculture in the international market while meeting people's demands for livelihood and ecological environment.

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