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Current Situation, Problems and Countermeasures of Modern Agricultural Construction in Bijie Experimental Area

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Abstract Firstly, the current situation and existing problems of modern agricultural construction in Bijie experimental area were analyzed, and then the countermeasures of promoting construction and sustainable development of modern agriculture were proposed according to the reality of agricultural development in the Bijie experimental area.

Key words Bijie experimental area, Modern agriculture, Current situation and problems of construction, Countermeasures

Located in the northwest of Guizhou Province, Bijie City is an experimental area for rural reform approved by the State Council in 1988. Since the foundation of the experimental area, to change rural poverty rapidly, Bijie City has developed rural infrastructure construction and water conservancy projects to increase farmland irrigation area, change a slope to a terrace, conserve water and soil, and improve soil fertilization. Meanwhile, it implements the strategy for developing agriculture through science and education as well as sustainable development strategy to improve the level of agricultural science and technology and the contribution of scientific and technological progress to agricultural economic growth. Besides, to improve agricultural ecological environment, it has also implements a series of ecological projects like the project of building protection forest in the upper reaches of the Yangtze River, "3356" project, and the project of returning farmland to forestland or grassland. Moreover, it adjusts and optimizes agricultural production structure to promote industrial management of agriculture and increase the scale and efficiency of agricultural industry with mountainous characteristics. By 25 years' construction and development, the poor people in the experimental area have attained a moderately high standard of living gradually. At the same time, its agriculture has transformed from traditional agriculture into modern agriculture, and modern agriculture has achieved remarkable results. However, there is also a great gap between the experimental area and a developed area in agricultural development, and it is an important strategic task to speed up modern agricultural construction, realize agricultural modernization, and meet the demands of people for agricultural products with high quality, nutrients and safety in future. Therefore, based on analysis of the current situation of modern agricultural development in Bijie experimental area, some countermeasures of promoting modern agricultural construction were put forward according to the problems of modern agriculture construction.

1 Current situation of modern agricultural development in Bijie experimental area

1.1 Agricultural infrastructure construction reaches a new level According to a survey, 93 700 hm² of irrigation farmland has been built in Bijie experimental area after 25 years, and 123 300 hm² of slope farmland has been turned into terraces. Meanwhile, traffic conditions of the experimental area have been improved obviously in recent years, which can promote the adjustment of agricultural structure, management of agricultural industry, and growth of agriculture with mountainous characteristics.

1.2 Industrial equipment level of modern agriculture has improved continuously Compared with 1987, annual growth rate of rural power consumption was 12.40% in 2010, and total power of agricultural machinery increased by 10.64% on average. In addition, the net quantity of chemical fertilizers used for farming was 190 200 tons, namely 517.5 kg/hm², with annual growth rates of 5.55% and 6.10%. Besides, it is common to cultivate fruit and vegetable in small and middle plastic sheds in suburbs.

1.3 Production technology of agriculture and animal husbandry has made great progress Hybrid corn, hybrid rice and wheat, virus-free potato and other good crop varieties have been popularized in some suitable regions, which promotes sustainable and stable development of grain. Meanwhile, based on the fact that tobacco hydraulic engineering has covered all tobacco-growing areas, breeding, standardization and regionalization of tobacco have been realized fully, and floating breeding and film cultivation have been popularized in large areas of tobacco-growing regions. High-quality rape varieties and seedling transplantation have been spread in most regions. In addition, the popularization of pollution-free production technology of vegetable and tea as well as anti-season vegetable production technology in summer and autumn in cool areas have promoted healthy development of tea and vegetable industries in Bijie experimental area. In respect of livestock production, large-scale and standard farming has made a breakthrough, and livestock breeding project, animal epidemic prevention engineering as well as forage and feed project have been implemented stably, so that technological level of breeding livestock

has improved, and slaughter rate has increased.

1.4 Agricultural science and technology innovation has made a new breakthrough In respect of breeding new crop varieties, more than 30 hybridized combinations of corn have been bred. Five japonica varieties of rice have been popularized, and the first japonica hybrid rice in Guizhou Province has been bred. In addition, six new varieties of wheat and five new varieties of potato have been bred. Meanwhile, agricultural science and technology innovation has made a new breakthrough, which provides a technical support for the advancement and sustainable growth of modern agriculture.

1.5 Combination of planning and policy guidance has promoted development of modern agriculture As the continuous development of agriculture and rural economy, Bijie experimental area has established many policies to support adjustment of agricultural structure and industrial management of agriculture. Meanwhile, it has also development plans for ecological animal husbandry, anti-season vegetable production in summer and autumn, potato, tea and tobacco industries, which promotes modern agricultural construction in Bijie experimental area. At present, anti-season vegetable industrial zone in Weining, Nayong, Dafang and Bijie begin to take shape, and the planting area accounts for 64% of total planting area of anti-season vegetable. Hot pepper industrial zone in Dafang, Bijie, Jinsha and western Guizhou has been formed, and its planting area accounts for 74% of total planting area of hot pepper. Besides, industrial zone of ecological organic tea in Jinsha and Nayong highlights its advantages, and area of the tea garden accounts for 52% of total area of tea garden in the whole city.

2 Problems of modern agricultural construction in Bijie experimental area^[1]

2.1 Agricultural infrastructure is weak Since the foundation of Bijie experimental area in 1988, to change agricultural production conditions quickly and improve the ability of agriculture to resist natural disasters, the government has strengthened basic farmland construction, water conservancy construction and ecological construction. However, due to living in poverty, local government and farmers lack the ability to take part in the construction, so that agricultural infrastructure construction can not meet the demand of modern agricultural development, thereby hindering the sustainable and stable development of modern agriculture in the experimental area.

2.2 Natural disasters occur frequently and agricultural product market is imperfect Most regions of Bijie experimental area have a subtropical humid monsoon climate, cold spell in later spring, low temperature and rainy days in autumn, spring and summer drought, flood, hail and other natural disasters have occurred frequently, which greatly threaten the development of modern agriculture in the experimental area. In recent years, with the change of agricultural ecological conditions, plant diseases and insect pests as well as animal epidemic disease have happened more

frequently compared with the 1970s and 1980s, so the cost of controlling them has also increased, and it needs advanced technology. However, the "technology barrier" to agricultural product trade at home and abroad has been strengthened gradually, so the development of modern agriculture is facing the twin pressures of natural and market risks. Moreover, there is no risk prevention mechanism for agricultural development in Bijie City.

2.3 Agricultural investment is not enough Besides the shortage of investment in agricultural infrastructure construction above, there is no enough investment in the construction of characterized agricultural industrial bases. On the one hand, local government, farmers and local enterprises lack the ability to invest the construction of characterized agricultural industrial bases. On the other hand, lagging natural, social, economic and technological development as well as poor local investment and financing environment also hinder the construction of characterized agricultural industrial bases. In addition, rural financial services system can not meet the demands of modern agricultural construction, and agricultural funds flow towards outside of agricultural system more obviously compared with developed regions, which also restricts modern agricultural construction.

2.4 Farmers' organization degree is low To develop modern agriculture and construct characterized agricultural industrial base, farmers ought to set up a cooperative organization to improve the ability of farmers to resist market risk. However, farmers in Bijie experimental area have been affected by smallholder and its economy and consciousness for along term, so they show little enthusiasm for setting up an agricultural cooperative organization. Thus, there are hundreds of agricultural specialized cooperatives in the experimental area, but there are few leading cooperatives, which has restricted the construction and development of modern agriculture.

2.5 Agricultural industrialization level is low Industrial management of agriculture has developed in Bijie experimental area for more than ten years, but its agricultural industrialization level is still low on the whole. For instance, there are few leading enterprises, and enterprises leading farmers to achieve common prosperity are even few. For few successful industries, there is only one-time buyer-seller relationship between enterprises and farmers in primary product trade. During the construction of modern agriculture, farmers have to take the market risk of constructing characterized agricultural industrial bases, so that the construction of characterized agricultural industrial bases is unstable.

2.6 Construction of agricultural social service system is imperfect and its service level needs to be improved Agricultural social service system of Bijie experimental area is imperfect in fact. That is, agricultural service agencies can be found in each town, but working personnel, government functions are vacant, and agricultural services are lost. The construction and service level of agricultural social service system can not meet the demands of modern agricultural development for agricultural social service, which has seriously restricted the health development of

modern agriculture.

2.7 Farmers have low sci-tech and cultural qualities With the improvement of social and economic environment in China, there are more young farmers working in cities in Bijie experimental area, farmers with old age and low level of education are left in rural areas, and they have weak ability to receive new technology and new varieties, which is not favorable for the popularization of standard production technology during the construction of modern agriculture.

3 Countermeasures of promoting modern agricultural construction and development

3.1 Speeding up agricultural infrastructure construction to lay the foundation for modern agricultural development To speed up modern agricultural construction in Bijie experimental area, it is necessary to strengthen agricultural infrastructure construction at first. Firstly, it is needed to strengthen traffic infrastructure construction to improve traffic conditions. Secondly, farmland water conservancy infrastructure should be improved to enhance irrigation area and water utilization rate according to the reality of Bijie experimental area. Thirdly, it is necessary to protect farmland and speed the project of changing slope cropland into terraces, so that average farmland area of agricultural population per capita reaches above 350 m². Fourthly, it is needed to improve agricultural ecological environment and control agricultural environmental pollution, so as to ensure the safety of agricultural products in quality. Fifthly, to develop high-efficiency agriculture, we should speed up facility agricultural construction and explore the ways of developing modern agriculture in mountainous areas.

3.2 Actively popularizing agricultural science and technology to ensure stable development of grain production As continuous development of agriculture and rural economy, it is necessary to increase grain yield based on agricultural science and technology^[2]. In addition, projects of increasing grain yield should be implemented, and policies of supporting agriculture and benefiting farmers should be implemented in rural areas to improve farmers' enthusiasm for grain production. Meanwhile, farming and cultivation techniques of agricultural machinery in mountainous areas should be popularized to improve large-scale production efficiency and agricultural productivity.

3.3 Strengthening the adjustment of agricultural production structure to promote healthy development of characterized agriculture in mountainous areas Firstly, it is needed to develop characterized industries of potato, ecological livestock, characterized fruit, vegetable, Chinese herbal medicines, tea, edible vegetable oil and tobacco. Second, it is necessary to make full use of all kinds of trade fairs to build and popularize a brand, such as create "Wumeng" Brand depending on Weining potato, Zhijin Zhusun and Dafang hot pepper, so as to make high-quality agricultural products of Bijie experimental area famous in Guizhou Province and even China. Third, the adjustment of agricultural production structure and development of characterized agriculture

and tourism should be combined to promote the construction of tourism agriculture parks. For instance, Nayong and Jinsha County can make full use of their national pollution-free tea bases to develop tea culture, improve tea taste and build "ecological tea garden" and "tourism and leisure park". Fourth, it is needed to develop special wholesale market for agricultural products, cultivate rural brokers and improve market mechanism. To meet consumption demand, the production, processing and sales network composed of farmers, production bases, wholesale market, distribution centers and supermarket chains should be built to form a complete distribution chain to promote the adjustment of agricultural production structure in mountainous areas.

3.4 Expanding financing channels and establishing multiple input mechanism to promote modern agricultural construction A new input mechanism should be set up to meet the demand of agricultural development for funds. It is suggested that special funds should be set up to support leading enterprises, specialized cooperatives and major farmers to construct agricultural product bases in Bijie experimental area. Meanwhile, the experimental area ought to further improve investment environment and expend financing channels, such as attracting foreign capital and encouraging foreign enterprises to take part in the construction. Financial sectors ought to support agriculture through enlarging credit scale and extending loan time. Insurance companies should improve insurance coverage to increase the ability of agriculture to resist market risk and natural disasters. In addition, a guarantee company should be set up to offer guarantee on the loan of characterized agriculture^[3].

3.5 Strengthening enforcement of agricultural laws and regulations and improving the level of managing agriculture by laws Managing agriculture according to laws is a necessary requirement of modern agricultural development, so enforcement of agricultural laws and regulations should be given priority during the construction of modern agriculture. According to the reality of Bijie experimental area, the enforcement of agricultural laws and regulations, like *Agricultural Law*, *Seed Law* and so forth, should be paid more attention to. Firstly, a high-quality law enforcement team should be established. Secondly, the popularization of agricultural laws and regulations should be strengthened to improve legal awareness of agricultural management departments as well as agricultural producers or managers. Thirdly, laws about seed, pesticide, fertilizer, agricultural environment, farmland protection and so on should be enforced to protect lawful rights and interests of agricultural producers or managers and consumers. Fourthly, the monitoring system of agricultural product quality safety should be improved, and the quality of agricultural products should be monitored strictly during production, purchase, storage, transport, processing and selling. Fifthly, the supervision of pesticide and fertilizer should be strengthened, and high-efficiency, low-toxicity and low-residue pesticide, biological pesticide and physical technology for controlling plant diseases and insect pests should be popularized. Meanwhile, ecological agricultural mode

should be conducted, and high-quality fruit, vegetable and tea should be developed into green and organic food.

3.6 Innovating the system and mechanism of agricultural production and management to create a good system for healthy development of modern agriculture in mountainous areas

It is necessary to promote the development of farmer specialized cooperatives and associations and increase their support in technology, management and funds. According to the development of competitive industries and characterized industries, farmer specialized cooperatives with great leading ability should be established to promote agricultural industrial management and modern agricultural construction. Meanwhile, to improve income of agricultural producers or managers, right determination and registration of land and other agricultural resources should be carried out in rural areas to centralize land and change agricultural production and management mode from decentralized management into large-scale management.

3.7 Training farmers to improve their cultural and scientific qualities

Firstly,

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arranged, prominent in key points, convenient for use, and is helpful for decision-making and resource allocation during agricultural popularization.

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farmers should be trained in agricultural useful techniques, especially major breeding farmers. Secondly, a new type of farmers should be created through training in production, management and circulation of modern agriculture. Thirdly, young farmers should be trained to develop characterized agriculture in mountainous areas and modern agriculture in future, so as to supply grain and other agricultural products to urban and rural residents continuously.

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