

Research on the Innovative Development of Agricultural Income Insurance in China under the Strategy of Rural Revitalization

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Abstract: *In the context of the rural revitalization strategy and food security strategy, it is urgent to accelerate the construction of an agricultural income insurance system for reforming and empowering the upgrading of China's three agricultural industrial structures in order to achieve the goal of a strong agricultural country. This paper discusses the urgency and necessity of optimizing China's agricultural income insurance under the rural revitalization strategy, analyses the difficulties and shortcomings encountered in the piloting of agricultural income insurance in China, draws on the institutional arrangements and operational management experience of agricultural income insurance in the United States, and puts forward policy recommendations for the innovative development of agricultural income insurance in China under the rural revitalization strategy.*

Keywords: *agricultural insurance; income insurance; rural revitalization; international experience*

1. Introduction

The increasingly complex macro situation at home and abroad has adversely affected China's agricultural supply-side structural reform, agricultural development and agricultural product price volatility, agricultural product price risk is increasingly prominent, and the role of traditional agricultural insurance is weak. Agricultural income insurance can not only protect the yield and price risks, but also help stabilise farmers' confidence in production, promote the quality and efficiency of agricultural production, and promote the comprehensive implementation of the strategy of rural revitalisation. In June 2021, the main grain-producing counties in China carried out income insurance for three types of grain crops, namely, rice, wheat and maize, and agricultural income insurance began to be carried out on a large scale in China. At present, agricultural income insurance has been better carried out on major crops such as rice, and progress has been made in various endeavours, accumulating some experience in the operation and management of agricultural income insurance^[1].

Agricultural income insurance in China started late compared with developed countries in agricultural insurance, and there is still a large gap and room for innovation in specific practice. In the context of comprehensively promoting rural revitalisation and building China into a modern socialist agricultural powerhouse, how to innovate and develop agricultural income insurance so that it can better play a positive role in promoting the rural revitalisation strategy, boosting the stability of farmers' incomes, and building an agricultural powerhouse is a major issue that the government and the insurance industry urgently need to study and solve^[2].

2. The Urgency and Necessity of Innovating Agricultural Income Insurance in China under the Rural Revitalisation Strategy

2.1 Agricultural income insurance can empower the development of the three rural industries and promote the rural revitalisation strategy

In the context of rural revitalisation, the significance and functions of agricultural insurance have been expanded to cover several aspects of the three rural issues. As an important part of the strategic programme, agricultural income insurance plays a significant role in modernising agriculture, preventing recurrent poverty and strengthening rural governance. After years of development, the premium scale of China's agricultural insurance has jumped to the first place in the world, and has maintained a good

growth trend. Agricultural income insurance is an insurance innovation in the field of agricultural insurance to better serve the work of three rural areas and share agricultural risks, which can enhance the role of agricultural insurance as a substitute for direct financial subsidies, diversify risk dispersion, strengthen farmers' risk resilience and reduce financial pressure. Agricultural income insurance will play a key role in the revitalisation of the three rural industries^[3].

2.2 Guaranteeing price stability and secure supply of food and important agricultural products

We will strengthen the foundation of food security on all fronts, improve the mechanism for guaranteeing the income of grain farmers and the mechanism for compensating the interests of the main production areas, and ensure that the rice bowls of the Chinese people are firmly in their own hands. Guaranteeing a stable and secure supply of grain and important agricultural products has always been a top priority in building a strong agricultural country. It is necessary to continue to improve the agricultural support and protection system and to improve the rural financial service system. Agricultural income insurance is an important tool for stabilising the prices of agricultural products and guaranteeing the supply of food security. Guaranteeing food security is a necessary move to achieve stability and progress, and is the primary task of rural revitalisation, requiring agricultural insurance to transform from cost insurance to income insurance.

To comprehensively strengthen the foundation of food security, it is urgent to improve the income guarantee mechanism for grain farmers and the compensation mechanism for the benefits of the main producing areas. A stable and secure supply of food and important agricultural products is always the core task of building a modern socialist agricultural powerhouse. It is necessary to continuously improve the agricultural support and protection system and the rural financial service system, and to innovate the way agricultural insurance supports the agricultural industry. Ensuring food security is a necessary step towards achieving stability and development, and is also the key to rural revitalisation, which requires agricultural insurance to shift from cost protection to income protection. Agricultural income insurance covers income risks and is an important means of stabilising agricultural prices and ensuring food security^[4].

2.3 China's agricultural income insurance development problems, urgent need for innovation and improvement

China's agricultural income insurance in the policy support of the development of a good situation, but in the pilot found that the scale of China's agricultural income insurance growth and system lagging contradiction highlights the need to innovate the agricultural insurance system and products under the strategic needs of the new era of food security. Income insurance is a product of agricultural insurance system innovation, due to the short development time of China's agricultural income insurance, also facing insufficient coverage, curing insurance product design, risk protection level is not high, affecting the enthusiasm of farmers to participate in the insurance, resulting in part of the small-scale cultivation of farmers insufficient understanding, the willingness to insure is not strong. In order to better promote the strategy of rural revitalisation and guarantee China's food security, agricultural income insurance needs to be further developed and improved in terms of system construction, product innovation and insurance operation^[5].

3. Realistic Difficulties in the Innovative Development of Agricultural Income Insurance in China

3.1 Deficiencies in the design of agricultural income insurance products

In promoting full-cost insurance in some pilot districts, the channels for farmers to take out the original policy-based agricultural insurance were not retained. The higher premiums for full-cost insurance have made it impossible for some small farmers who do not have a need for high-risk protection to take out insurance. Moreover, there are differences between the grassroots operating organisations of traditional agricultural insurance and those of income insurance, resulting in traditional agricultural insurance and income insurance in the same region being operated by different insurance operating organisations, which may lead to confusion for farmers to enrol in insurance policies, lack of understanding of the policies, and undesirable competition among insurance operating organisations. In addition, with the structural reform of the agricultural supply side and industrial upgrading, the three agricultural industries have gradually shifted from the cultivation of major foodstuffs to the cultivation of modern high net value agricultural cash crops such as vegetables and fruits, and the new type of

agriculture has increased the potential demand for new types of income insurance. At the present stage, the cultivation area of special agricultural products with relatively high economic value is relatively small, and most of the financial subsidies for policy-based agricultural insurance are targeted at traditional types of insurance and crops, so that the needs of some special agricultural business entities cannot be met. As a result of fewer subsidies and support policies, farmers are less motivated to take out insurance.

3.2 Low incentive for farmers to participate in income insurance

Pilot insurance requires farmers to pay 30 per cent of their own premiums, which is higher than traditional insurance, resulting in a heavier burden on farmers. For example, in Shandong Province, the premium for full-cost wheat insurance is 11 yuan per mu, which is 175 per cent higher than the self-payment portion of traditional wheat insurance. Pilot varieties of insurance are more attractive because they better meet the risk protection needs of farmers, but the pressure on premiums has weakened the incentive to take out insurance, affecting their willingness to participate. Average payouts to farmers were lower due to lack of flexibility in determining the amount of insurance and differences in the quality of data collection between the amount of insurance and actual income. Increased premium payments and reduced insurance payouts affect farmers' willingness to take out insurance and do not help protect their effective income. Some agricultural insurance coverage is generally lower than farmers' expectations; for example, the maximum coverage for cash crops such as melons and flowers in sheds is much lower than the actual cost, and insurance fails to provide farmers with effective insurance protection and risk diversification, which affects farmers' trust in agricultural insurance and their motivation to take out insurance.

3.3 Low level of grassroots insurance organisations serving farmers

The grass-roots insurance organisations are in direct contact with farmers in underwriting insurance, and the level of activities carried out by the staff concerned will have a direct impact on farmers' attitudes towards participation in income insurance, and indirectly on the orderly promotion and sustainable development of income insurance. At present, the professional quality of grassroots insurance staff needs to be improved. Although the insurance service institutions at the county level have been widely covered, and some townships have also set up service points, but affected by operating costs and other factors, there are fewer high-quality grass-roots insurance staff, underwriting and claims mostly rely on townships, villages and groups of mediation agencies to co-operate with the lack of professionalism is difficult to achieve the scientific and accurate settlement of claims. Generally, all policy terms and conditions are formulated by insurance companies, and there is information asymmetry between insurers and policyholders, and insurance companies are obliged to explain policy terms and conditions. However, in practice, farmers often do not understand and are not clear about the policy terms, leading to disputes. Due to the complexity of the underwriting procedures of income insurance, the efficiency of loss determination and claim settlement is low. Agricultural disasters are time-concentrated, large in volume and wide in scope, etc. Once a disaster occurs, the time for investigation and claim settlement is limited, which requires high work efficiency, and the lack of talents and the immaturity of the claim settlement mechanism have led to a lag in the work.

4. The Development Experience and Insights of Agricultural Income Insurance in the United States

4.1 Experience in the development of agricultural income insurance in the United States

The United States is a world leader in agricultural price risk management for farmers. Since the 1990s, the United States government has been adopting a long-term policy of financial subsidies for agriculture, which to a certain extent has weakened the competitiveness and development potential of its agriculture in the world. With the problem of financial and social pressure in the United States coming to the fore, the parties concerned in the United States have launched a series of reforms and innovations in agricultural support policies, of which stabilising the income of farmers is an important direction. In 1996, the United States introduced an income insurance policy for agriculture, with the aim of controlling the increasing price risks of agricultural products, stabilising the income of the planting industry, and preventing and resolving systemic risks in agricultural production. The United States has taken direct or indirect ways to protect the interests of agricultural producers and promote the stable development of agricultural production. Agricultural income insurance has gained the support of local farmers and developed rapidly, becoming the main tool for agricultural production and management to cope with

price fluctuations and production losses, and is an important part of the United States agricultural support policy system.

In 1996, the United States began piloting income insurance for agricultural production, which received widespread attention upon its introduction. In order to expand the coverage of income insurance in the country, the federal government drafted and passed the Agricultural Risk Protection Act, and in 2011, the premium income from agricultural income insurance in the United States exceeded \$10.7 billion, accounting for 90 per cent of the premium income involved in agriculture-related insurance. The U.S. federal government has continued to innovate and develop agricultural income insurance, and its involvement in U.S. agricultural production is rapidly increasing. Revenue insurance is favoured in practice for the following reasons: First, by including price risk in the scope of agricultural income insurance, it provides agricultural production and growers with a defined income protection target and meets their demand for stable income; second, the price level of agricultural income insurance is set based on the futures market price of agricultural products, and the futures price is generally higher than that of the traditional yield insurance, so that farmers will receive expected income compensation will be higher than the actual loss; Third, the U.S. government has increased the premiums for farm income insurance. The U.S. government has increased premium subsidies for agricultural income insurance since 1999, thus reducing the premium burden on agricultural production and growers.

The overall framework of agricultural income insurance in the United States is based on the government as the overall co-ordinator, providing cost subsidies and reinsurance for commercial insurance companies under the leadership of the government, and providing a higher proportion of premium subsidies to agricultural income insurance policyholders. Commercial insurance companies provide income insurance products to farmers, and after underwriting the income risk of farmers, they can also take out reinsurance with other commercial reinsurance companies. The U.S. government, in the income insurance system, assumes the task of regulating and formulating the terms and conditions of rates and indemnities, with the aim of establishing a market-based agricultural income insurance operation system led by the government with the participation of commercial insurance companies. The diversification of U.S. agricultural income insurance products is high, with different income insurance products for different cash crops and different planting areas, as well as a whole-farm income insurance programme with unlimited crop varieties and planting areas for universal insurance needs. As the U.S. agricultural income insurance product design refinement, targeted, product diversity, so planting farmers can choose the appropriate agricultural income insurance products according to their own situation. The development process of U.S. agricultural income insurance is also the process of continuous enrichment of the types of agricultural insurance and continuous improvement of the system.

There are three main types of common agricultural income insurance in the United States: one is the guaranteed income plan. According to the historical average yield of a particular agricultural product and its futures price on the commodity exchange to calculate the policyholder's expected income, and then as the insurance amount of the insurance subject, such as crop prices higher than the expected price, the insurer of the higher loss of income to provide additional compensation. The second is a compensatory income scheme. If the crop price is higher than the expected price, no additional compensation is provided and the original insurance amount remains the basis. The third is an adjusted income protection scheme. A plan that takes into account the overall farm income and pays compensation if the farmer's income is lower than the average income of the previous five years or the expected income for the year. Revenue insurance has developed over the years to occupy a major share of the U.S. farm insurance market, and has received widespread attention and support from insured farmers, with premium income far exceeding that of other agricultural insurance.

4.2 Experience with the operation of agricultural income insurance in the United States

The general object of agricultural insurance is crop yield, and the innovation of income insurance is to include the risk of price fluctuation of agricultural products due to market and natural risks in the scope of coverage. Price risk is highly influenced by the market, national policies, natural risks and other factors, and is also subject to human factors, making it difficult for price risk to fully satisfy the insurable risk element. Losses due to agricultural income risk are usually large, and the risk is non-objective and does not meet the actuarial reasonableness of insurance, and insurance companies usually hold an avoidance attitude towards such risks. In order to alleviate the loss beyond solvency faced by insurance companies after underwriting income insurance, the U.S. government has made it possible for insurance companies to diversify price risk to a certain extent and reduce the negative impact through innovative policy design and relevant supportive policies. Through the design of diversified insurance products, the formulation of humane and targeted insurance terms, and through a wide range of coverage of the income risk of

agricultural production, to meet the multi-level and differentiated insurance needs of different farmers for income insurance, the operation of the U.S. agricultural income insurance has also achieved success.

For underwriting risk control, the practice of income insurance is to provide predictable protection for farmers' planting and breeding income within the insurance company's maximum insured amount. Factors in agricultural production that have a greater impact on farmers' income include market demand, supply of agricultural products, prices of agricultural products, etc. In order to control income loss caused by price risk, insurance companies should focus on considering the impact of the above factors on farmers' production and insurance operations. The yield of agricultural products insured by farmers is a more difficult indicator to determine in the underwriting process, the U.S. practice is to use the historical average yield of agricultural products as the calculation standard, from the expected price and expected protection of the two perspectives to design the policy and control their own underwriting risk. The payout mechanism of U.S. agricultural income insurance usually combines a number of indicators, including the expected yield of agricultural products, futures prices and coverage ratios. Most income insurance policies use the historical average yield estimates for the region in calculating the expected yield of agricultural products. As an important basis for determining insurance prices, futures prices for agricultural commodities are generally calculated using futures prices on futures exchanges. Harvest prices for agricultural commodities are determined at different times due to timing differences between states. For different agricultural products in different regions, the United States agricultural income insurance has a flexible way of determining the harvest period price, and the farmers receive a diversified way of payment, which can meet the diversified differences in the needs of the insured farmers.

5. Policy Recommendations for Innovative Development of Agricultural Income Insurance in China under the Rural Revitalisation Strategy

5.1 Expanding policy-based agricultural income insurance coverage

Taking into account the special industries of each region, more special agricultural products will be included in the scope of policy-based agricultural income insurance, so as to protect the large-scale development of special industries in each region. Provide certain policy support for the development of new types of agricultural insurance policy and the scale development of special agricultural insurance, and strive for financial subsidies for key types of insurance. In the context of China's rural revitalisation and the construction of a modern socialist agricultural powerhouse, agricultural insurance covers not only agricultural cultivation, but also many aspects of the three rural industries. Agricultural income insurance, as an important hand in the rural revitalisation strategy, plays an increasingly important role in empowering agricultural modernisation, preventing the return of poverty and enhancing rural governance. Agricultural income insurance serves the whole industry chain of the three rural areas more deeply, the primary task of rural revitalisation is to revitalise the industry, the demand for income insurance in the three rural industry chain is increasing day by day, and the disaster risk and market price risk are profoundly affecting the three rural industries from planting and breeding to processing and sales. Therefore, the whole industrial ecology of the three rural industries is in urgent need of high-quality agricultural income insurance and related support policies, and it is necessary to expand the scope of coverage of agricultural income insurance, so as to provide as much protection as possible for the risks of the whole industrial chain of the agricultural industry.

5.2 Improve premium subsidy policies to enhance the incentive to take out insurance

The relevant departments should speed up the construction of supporting facilities related to agricultural income insurance, strengthen the training of grass-roots service personnel, improve laws and regulations, and continuously optimise financial subsidies. At present, there is a lack of a set of effective laws and regulations to guide the innovative development of agricultural income insurance, which should be designed at the top level from the national level to achieve the institutionalisation of agricultural income insurance, so that it can be operated and governed in accordance with the law. China's income insurance pilot financial subsidy funds are currently mostly from the provincial level, and there are large differences in financial subsidies in different provinces. Continuously optimising income insurance policies, increasing domestic pilot areas, wider coverage of income insurance, expanding scale of insured farmers, and increasing pressure on local finances should be considered in the context of the whole country, exploring the establishment of a pool of coordinated allocation of funds from the central to local finances, optimising the subsidy structure at all levels of finance, and reducing the burden on local finances. Explore the establishment of a coordinated intra-regional planning system for the distribution

of subsidy funds to further alleviate the pressure on government financial expenditures and farmers' premium expenditures. Implement financial subsidies to specific crops in different regions, further expand the utility of financial subsidies, mobilise farmers to participate in insurance, increase the attractiveness of income insurance, reduce the subsidy differences and imbalances brought about by geographic differences, and avoid farmers giving up insurance due to excessively high premiums. Increase publicity for income insurance support policies, widely publicise the importance of agricultural income insurance, strengthen farmers' awareness of risk diversification, and improve farmers' ability to withstand income risks.

5.3 Innovative product design and optimised rate adjustment mechanism

U.S. agricultural income insurance products meet the production needs of local farmers and are widely welcomed. As rural speciality industries have broad prospects, income insurance should endeavour to provide innovative products and methods to emerging agricultural growers and encourage them to carry out innovative operations. Agricultural income insurance should be combined with China's national conditions and local agricultural production characteristics, to explore the development of agricultural income insurance products suitable for Chinese characteristics, starting from the full range of insurance operations, neither copying foreign experience, nor taking the old road of lack of innovation. For China's insurance product design problems, one is to continue to improve the income insurance price determination mechanism. Farmers' demand for income insurance depends on the agricultural market-oriented operation and the continuous improvement of agricultural products futures market, with the development of agricultural products market, income insurance reasonable pricing is the premise of the futures market capacity and the number of trading varieties increased. Explore the agricultural futures market and historical average price pricing methods, implement differentiated pricing for specific farmers' production, refer to the historical average yield of local crops, and combine factors such as the policyholder's income risk and natural risk, so as to reduce the practice of uniform pricing across regions and increase the scientificity and accuracy of insurance pricing. A dynamic adjustment mechanism for insurance coverage should also be developed in conjunction with the agricultural production situation in the region, so as to meet the diversified insurance needs of different farmers, reduce the operational risks of the agency, and realise a win-win situation for the insured and the insurance company. Second, innovative income insurance product design. The U.S. agricultural income insurance product diversification degree is high, both for different insurance situation of multiple types of income insurance, but also unlimited crop varieties and planting areas of the whole farm income insurance programme. Therefore, farmers can choose suitable agricultural income insurance products according to their own situation. China should actively innovate income insurance products and modes, combining local supply and demand characteristics, increasing the number of insured farmers and optimising the benefits of subsidies, so as to promote the high-quality and innovative development of income insurance.

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