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Risks in the Transformation of Scientific and Technological Achievements concerning Tropical Agriculture

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Abstract The transformation of scientific and technological achievements concerning tropical agriculture has the characteristics of high risk and high return. Based on the characteristics of transformation of scientific and technological achievements concerning tropical agriculture, this paper analyzes the risk factors during the transformation of scientific and technological achievements concerning tropical agriculture. In accordance with the current situation of low transformation rate of scientific and technological achievements concerning tropical agriculture in China, this paper proposes the measures to avoid the risks in the transformation of scientific and technological achievements concerning tropical agriculture and enhance the transformation rate of scientific and technological achievements concerning tropical agriculture.

Key words Tropical agriculture, Scientific and technological achievements, Risk

1 Introduction

Tropical agriculture is an important part of the national agriculture, and the key to the development of tropical agriculture lies in technological innovation. Only by transforming scientific and technological achievements concerning tropical agriculture into practical productive forces can the utilization value of scientific and technological achievements concerning tropical agriculture be better realized, and the role of science and technology innovation in supporting and leading economic and social development. With the rapid development of tropical agriculture and tropical rural economy, tropical agriculture, as a pillar industry in tropical regions, is facing severe challenges, and the transformation of scientific and technological achievements concerning tropical agriculture becomes more and more important. Therefore, accelerating the conversion of scientific and technological achievements concerning tropical agriculture to promote the development of modern tropical agriculture will become the direction of China's tropical agricultural development. Unlike traditional cotton and oil crops, tropical crops have strong regional features and long product life cycle, and the transformation of scientific and technological achievements also has the features of long period and public welfare. At the same time, affected by domestic and foreign market environment, economic and trade situation, political situation, currency, credit policy, pests and natural disasters caused by extreme weather, the transformation of scientific and technological achievements concerning tropical agriculture is facing many potential risks. Therefore, on the basis of full investigation, this paper performs a comprehensive and objective analysis of risks in the transformation of scientific and technological achievements concerning tropical agriculture, studies the generation process of transformation risk of scientific and technological achievements concerning tropical agriculture risk, and explores the constraints on the transformation of scientific and technological achievements concerning tropical agriculture, in order to foster risk awareness, minimize risks and maximize the efficiency of the transformation of scientific and technological achievements concerning tropical agriculture.

2 Risk factors for the transformation of scientific and technological achievements concerning tropical agriculture

2.1 Benefit risk Whether the transformation of scientific and technological achievements concerning tropical agriculture can be successful depends on the expected benefits regarding achievement transformation of transferees. The expected benefits of the transformation are restricted by subjective and objective factors as well as internal and external environmental factors. Through survey and research, it is found that the production cycle of tropical agriculture is long, and a considerable part of users who undertake the transformation of scientific and technological achievements concerning tropical agriculture are difficult to continue, due to large early investment, poor economic efficiency and serious losses. Some of them even go bankrupt and lose everything.

2.2 Quality risk The transformation of scientific and technological achievements concerning tropical agriculture is mainly for the enterprises and farmers in the hot zones which are mostly border areas, the regions inhabited by ethnic minorities or poor areas. Due to historical reasons, the education is seriously lagging behind in these areas, and the cultural quality and production ability of agricultural producers are generally low, and especially their risk awareness and risk prevention ability are congenitally deficient. At the same time, because of lack of relevant knowledge or poor understanding of relevant production term, the achieve-

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ment transformation users are likely to suffer losses.

2.3 Environmental risk Tropical agriculture is mainly concentrated in Hainan, and the southern regions of Yunnan, Guangxi, Guangdong, Fujian and Hunan as well as Panzhihua in Sichuan and dry and hot valley in Guizhou. The production cycle is long, and it is greatly affected by natural conditions, especially climatic conditions (such as typhoons, pests and diseases and other natural disasters). Hainan is vulnerable to typhoon; Guangxi, Guangdong, Fujian, Sichuan and Guizhou are vulnerable to cold damage; Yunnan is vulnerable to drought, earthquakes and the like. Therefore, the transformation of scientific and technological achievements concerning tropical agriculture can be easily changed by the external environment to affect the both parties of achievement transformation, and cause unpredictable difficulties and losses to the users.

3 Risk factors for the scientific and technological achievements concerning tropical agriculture

3.1 Risk of "sleeping" The low popularization rate and success rate problem about the transformation of scientific and technological achievements concerning tropical agriculture is always a persistent ticklish problem. Many achievements and patents are in a "sleeping" state, resulting in the waste and loss of human resource, material and financial resources. The reason is that researchers pay close attention to the titles closely related to treatment, and the professional title appraisal is mainly based on the assessment of the number of papers published, the number and level of award-winning scientific research results and other indicators. There is no scientific and rational indicator to measure whether scientific and technological achievements can translate into productive forces, and generate economic benefits. This makes researchers focus on the papers and give less consideration to the possibility and practicality of the achievement transformation, so that the scientific research topics are likely to be unrealistic, or the achievements fail to catch up changes in the market and are eliminated.

3.2 Risk of insufficient effective supply Due to institutional reasons, the value of scientific and technological achievements has long been assessed according to the national funds, the number of papers published, academic status of participants and the level of awards. The missing market value results in insufficient effective supply of scientific and technological achievements. Most of the tropical regions are poor areas, and the final body of promoting and applying scientific and technological achievements is farmer, so the transformation and promotion of scientific and technological achievements concerning tropical agriculture depends largely on farmers' scientific and cultural quality and economic strength. In addition, since the tropical regions are relatively close to the Pearl River Delta, many literate young farmers generally become migrant workers or abandon farming to engage in business, and those engaged in tropical agricultural production are mostly the elderly and women with low education level. They lack ability to receive and apply the scientific and technological achievements concerning tropical agriculture, fundamentally affecting the enthusiasm of farmers for adopting new technologies.

4 Risk factors in the process of the transformation of scientific and technological achievements concerning tropical agriculture

4.1 Financial risk Achievement transformation is a re-development and re-creation process, and it needs adequate funding for research and technology promotion. The financial risk is large in the achievement transformation. Firstly, the investment system is not perfect. The state invests a lot in research but little in achievement transformation. Secondly, the fund demand contradiction is obvious, making many high quality popular scientific and technological achievements fail to be transformed, and some achievement transformation projects have a fine start but a poor finish. Thirdly, some achievement transformation projects have disastrous consequences and can't regain the original capital.

4.2 Market risk The achievement transformation process is the process of marketization in essence. The market is changing, so there are many instabilities and market risk is the main risk causing failure of transformation of scientific and technological achievements. Market risk is mainly focused on two aspects, namely whether farmers and agriculture-related enterprises can accurately grasp the market potential of scientific and technological achievements concerning tropical agriculture, and consumers´ expectation of buying new products.

4.3 Contract risk It includes the risk before signing contract, the risk when signing contract, and the risk in fulfilling the contract. In the achievement transformation process, due to weak legal risk consciousness and other factors, the breach of contract and contract disputes occur sometimes. For example, for the current order agriculture, the companies or farmers still do not fulfill contract farming agreement under various pretexts after the contract is signed, making the companies or farmers suffer losses.

4.4 Legal risk Legal risk refers to the possibility of tropical agricultural production losses due to legal factors in the course of the transformation of scientific and technological achievements concerning tropical agriculture. Like the large-scale agriculture, tropical agriculture relies on input of labor, capital and technology, and the scientific and technological achievements concerning tropical agriculture also relies on national laws and regulations, especially *Agricultural Law*, *Patent Law*, *Achievement Transformation Law* and *Technology Contract Law*, so whether the legal environment is conducive to the development and application of scientific and technological achievements concerning tropical agriculture is the key factor in successful transformation of scientific and technological achievements concerning tropical agriculture. The laws and regulations advancing with the times as well as reasonable mechanism will help to promote the conversion of scientific and technological achievements concerning tropical agriculture.

5 Conclusions

In summary, the transformation risk of scientific and technological achievements concerning tropical agriculture is objective, diverse and comprehensive, and involves all participants. All links interact with each other, and jointly determine the size of the risk. Meanwhile, the transformation risk of scientific and technological achievements concerning tropical agriculture is preventable and controllable. Only by timely, fully and correctly identifying risk can we prevent and avoid many risks, especially legal risk, thus improving the transformation efficiency of scientific and technological achievements concerning tropical agriculture, promoting the development of modern tropical agriculture, increasing farmers income and promoting rural prosperity.

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