Scientific and Technological Envoys of University—A New Model of Modern Agricultural Extension and Technology Transfer

Cheng-min LIU¹ and Li MA²

¹School of Agriculture, Ningxia University, Yinchuan, Ningxia, 750021, China
²General Hospital of Ningxia Medical University, China

Keywords: Scientific and technological envoys, Agricultural extension, Technology transfer.

Abstract. The operation mode of the system of scientific and technological envoys (STE) has developed gradually in the past few years in agriculture, in order to adapt to demand of agriculture and farmers in different areas, the mode has been converted from simple interactive to comprehensive development mode that are multitudinous and more elements participation. The study focused on innovation mode and operation mechanism of STE in modern agricultural and technology extension in recent years, which covered practical and theoretical study, the results will provide more references for the further development of science and technology correspondent system.

Introduction

The system of scientific and technological envoys (STE) based on farmers and commissioner of science and technology, in order to satisfy the demands of rural science and technology, and through the benefit sharing and risk-sharing, market leading and the government guidance, it is to promote scientific and technological personnel to the rural grassroots system, it is also a new production relations that transforming traditional agriculture to modern agriculture, and promote the development of productivity, it is a reform that can effectively resolve the problem of "agriculture, rural areas and farmers" of production mode, the mode of operation, management mode and the way of organization[1].

The University of STE, as the backbone of this group, follow the rules of agricultural development and running regulation of university itself, under the guidance of the government and market-oriented, rely on the university of science and technology resources and advantages, using the program as project a joint, using relevant scientific research institutes and agricultural extension organizations of the grass-roots level, applying new agriculture technology demonstration and advanced agricultural high pay transfer of scientific and technological achievements to a model household, rural economic cooperation organization and agricultural enterprises and farmers. With China's agricultural structure diversification, diversification of economic way, diversified economy and agricultural economic growth mode transformation, promoting the development of agricultural extension system diversity has been imperative[2]. Therefore, how to comply with the new situation in the new period of development needs, and innovation of the rural work mechanism, establishing an extension and technology transfer mode that adapts to the market mechanism is worth to considerate and practice.

Definition

Scientific and Technological Envoys in University

Scientific and technological envoys in University, refer to scientific research institutions, colleges and universities to promote the further development of the agricultural science and technology extension, is willing to work in rural area, they were selected with technical knowledge and scientific research project [3]. University of science and technology envoys to give full play to the role of science and technology in rural development, and promote the transformation of scientific and technological achievements, at the same time, in order to realize the individual value, they work
in rural science and technology service for service or business, and provide technology services to farmers.

**Agricultural Extension Pattern**

Agricultural extension pattern refers to a comprehensive relationship with the operation mechanism and operation process in the presence of agricultural extension under the specific conditions of subject, object and mechanism, it include agricultural extension goal, object, content, method, strategy, organization structure and operation mechanism. Agricultural extension patterns can be divided into two types, the generalized model of agricultural extension and the narrow sense of agricultural extension. The former is a national or regional agricultural extension goal, object, content, strategy, method, and organization structure and operation mechanism. The latter mainly refers to the organization system of agricultural extension, also refers to organization structure and operation mechanism, which is a sum of promotion methods and measures in the promotion of agricultural technology [4].

**Technology Transfer Mode**

Technology transfer refers to the activity process of input and output in the country, region, industry, or within the system. Technology transfer mode includes the transfer of technical achievements, information, capacity, transplantation, absorption, communication and promotion of universal [5].

**Construction of Agricultural Technology Extension Model**

Science and technology is the first productive force, science and technology play an increasingly important role in promoting China's economic development, prosperity and powerful. Nowadays, the development of agriculture is no longer slash-and-burn cultivation, the development of modern agriculture is more and more need the support of science and technology, all kinds of new agricultural technology are useful to transform traditional agriculture, promote rural economic development, and increase farmers' income, but there is an intermediate link between the application of agricultural technology innovation and industry technology, that is agricultural extension. There are no real productivity, changing of the traditional agriculture, promoting rural economy and increase the income of farmers without agricultural extension system and excellent service [6]. In a sum, to use high tech in traditional agriculture, which penetrated into various factors of production in agriculture and rural areas, we must use the link.

**Public Welfare Extension Model**

In order to establish the socialist market economic system and to meet the requirements of economic globalization, the government at all levels will further change the functions, streamline the organization and improve the efficiency. Institutions also need to reform, distinguishing public welfare functions from the functions, making sure all staff get financial support. To institutions that have public welfare function should implement the "fixed quota system", using implementation of personnel competition, preferred employ, and ensuring full finance funding. To strengthen and improve the grassroots agricultural extension system, we must change the existing county and township level agricultural extension institutions. Through institutional innovation, enhance the power of the first line of the extension; improve services for farmers [7]. Agricultural extension institutions in county level should be changed to the leader of local industry technology; according to the characteristics of the agricultural economy layout in some areas, forming regional agricultural extension institution across the township, as a unit at the county level, undertake public functions, to serve the agricultural industrialization and regional economy.

**Extension Pattern of Agricultural Science and Education**

According to the law or contract, enjoy the benefits and risks, the institutions of agricultural scientific research shall follow the principles of voluntary, mutually beneficial, fair and honest credit. The intellectual property in the transformation of scientific and technological achievements
shall be protected by law. At the same time, the transformation of scientific and technological achievements should be beneficial to the improvement of economic benefit, social benefit and ecological benefit. Agriculture related university, college of agriculture and scientific research institutes should apply their achievements to help agricultural enterprises and farmers, meanwhile, some research institutes, to do business by themselves, will use the transformation of scientific and technological achievements into productive forces. Some will be made over, some scientific and technological achievements as a result of new technology new shares [8].

**Extension Mode of Company (or Enterprise)**

Some of the leading agricultural enterprises have advanced equipment and facilities, with advanced agricultural technology, excellent varieties and advanced management experience, they are the representative of modern agriculture, through providing seed, technical guidance, product purchase standard and demonstration to extension of new the varieties and new technologies in rural areas [8].

**Extension Mode of Teaching and Research Practice Demonstration**

Scientific and technological envoys of university relying on agricultural university and government participation. Through the establishment of teaching, scientific research and practice demonstration base in agricultural university to realize agricultural extension. Based on scientific and technological envoys of university, a new way of agricultural extension including agricultural university autonomy, innovation of talent, advanced technology of agricultural University. The above four modes, STE of university can use the extension pattern of agricultural science and education and scientific research and teaching practice demonstration mode, taking a variety of ways of scientific and technological achievements into productivity directly with the scientific and technological achievements as capital shares, applying the new achievements of new technology directly to the promotion of rural areas.

**Construction of Technology Transfer Mode**

**Transformation by Self Investment**

To implement the transformation of self investment is one of the effective ways to solve the problem of between science and technology and economy. It makes research institutes themselves become enterprises, and completely change the phenomenon of scientific research institutes have nothing to do with the enterprise. However, the research institutes are difficult to become enterprises. First of all, scientific research units must learn how to open up the market, to organize production, to manage company, to asset management and to manage debt; meanwhile, learn how to face market risks, and to prepare for the risks, which include bankrupt and merger. Some research institutes with better conditions for the companies, they can do business, and implement technology transfer [9].

**Transformation of Scientific and Technological Achievements to Others**

The main body of Transformation of scientific and technological achievements is enterprise, so, to research institutions play important roles in transferring the scientific and technological achievements to the enterprise. By the patent selling and contract, they can transfer scientific and technological achievements to enterprises. Due to scientific and technological achievements is intangible assets in unique, the price is often difficult to determine, lack of reasonable and scientific evaluation standards and principles when it was operated, also involves many specific issues, such as: required region of cooperation and technology transfer, duration, mode of payment, forms of cooperation and the protection of intellectual property etc. This is often caused controversial in the supply and demand, resulting in a long process of transformation, or even failure. The key point is to establish reasonable evaluation criteria and benefit distribution mechanism [10].
Cooperation for Transformation of Scientific and Technological Achievements

The market is the final standard to assess the success of transformation, which convert from science and technology to production. A science and technology to be converted into productivity based on getting production and profits by product sales. The transformation is a kind of unique economic behavior. There are many potential risks to programs the many unpredictable factors that exist in the market. Therefore, each stage of the transformation process should be based on market conditions, and improve the stage results according to market conditions. Understanding the market must run through the whole process of the transformation. Due to technical personnel do not understand the market, it is necessary to cooperate with others to making transformation, such as cooperation with seed companies, feed companies, pesticides companies and so on, getting the win-win situation by cooperation with others is very important[11].

Using Achievements Instated of Company Shares or Capital Contribution

Development of joint-stock enterprises is inevitable choice to solve the source of financial and develop commodity economy. Yuan Longping, the father of hybrid rice, put scientific and technological achievements as shares into the company that is fresh model for the transformation. Academy of Agricultural Sciences in Fujian Province is famous for Hybrid Rice Breeding, the achievements can be a share for company, so other holders can follow it[12].

Chinese agriculture and farmers are faced with the adjustment of agricultural structure; renew variety, application of new technologies, new agricultural products, and international trade policy challenges and so on. The stability of the countryside, improvement agriculture and increments farmers' income, is the most important work for party committees and government. How to improve the farmers the quality, improve the conversion rate of scientific and technological achievements and contribution, establish agricultural extension service system at the basic level is particularly important. The agricultural university is basic carriers for agricultural research, agricultural technology research and development, teaching agricultural talents, University of science and technology correspondent with its advantages of technological, using existing agricultural technology promotion and transfer mode, giving full play to the role of scientific research personnel in agriculture, which is benefit for distribution of social resources and improving efficiency of scientific and technological innovation.

Acknowledgement

This research was financially supported by the National Spark Program (2015GA880002).

References


