



On the Subject of China's Agricultural Science and Technology Optimization

Dan Wang

Administration Institute of Shenyang University
54 Lian He Street, Shenyang 110044, China
Tel: 86-24-6250-5091 E-mail: bettydan517@163.com

Hong Li

Mechanical and Electronic Engineering Institute of Guizhou Normal University
35 Da Ba Street, Guiyang 50014, China
Tel: 86-851-552-3973 E-mail: lihong702@163.com

Abstract

With the change of the pattern of agricultural science and technology extension system gradually, the construction of the main body of China's agricultural science and technology extension services is more and more important. The paper analyzes the problems of the main body of China's agricultural science and technology extension services, and gives us the proposals: cultivating diverse main bodies, playing the synergistic effect of the main body, and improving the capacity and vitality of the agricultural science and technology.

Keywords: Diversification, Agricultural science and technology extension, Synergy

Standing on the political and overall perspective, it puts forward to accelerate the construction and reform for rural or regional agricultural extension institution, which is "CPC Central Committee and State Council: Few opinions for promoting steady development of agriculture and continuing to increase the income of farmers in 2009". By guidance of Scientific Concept of Development, to serve the development of modern agriculture and promote the farmers continuously income increment as the goal, a new Agricultural Science and Technology Extension which is structure rational, scientific management, network sound and efficient operation will be gradually built, which is agricultural extension sector-led, based on cooperative economic organizations, and widely participated by agricultural scientific research & education enterprise and agriculture Technology. Among the participators, the most important and basic main bodies are Promotion of agricultural technology leader (government), agricultural technology of the donor (agricultural research, educational institutions, agricultural science and technology enterprises, agriculture and the Economic Cooperation Organization), as well as agricultural technology receptor (farmers), Their behavior will determine the process of agricultural extension and intensity. How to bring into full play the main role and coordinating the relationship between the main bodies has a certain practical significance for China's agricultural scientific and technological innovation, the farmer's income increment and rural development.

1. The main outstanding problems in present main body of Agricultural Science and Technology Extension of China

As a large agricultural country, Agricultural Science and Technology Extension has made considerable progress through the fruitful efforts in recent years. It gradually changed to integrated services of the rural scientific and technological change, from a top-down model of a one-way extension to a two-way interactive service, from a government-lead extension system to a government-guidance diversified service system. However, due to the different respective functions location and limited resources of each of the main bodies, there are the problems to influence playing the role of Agricultural Science and Technology Extension.

1.1 The supervisor has limited capacity and without enough supervision

The institutions of Agricultural Science and Technology Extension of government as the leader of agricultural extension, their direction of reform, policy formulation and investment in agricultural technology and other factors will have an important impact in the right direction of Agricultural Science and Technology Extension and the level of agricultural technology adoption. In the funds investment, although the total amount of China's agricultural science and technology investment increases every year, but specialized to promote the growth of funding is limited, and the investment channels is not diversified and imbalanced, all these have seriously affected the progress of agricultural extension and quality; In the structural reform, because the incentive mechanism, evaluation and examination mechanism of agricultural extension agency is not perfect, it has seriously affected the motivation of agricultural extension staff; In organizational management, the government supervision for agricultural science and technology enterprises have not done enough, the company unilaterally breached the contract which damaged the vital interests of the farmers have occurred frequently, it has seriously dampened the farmers' initiatives to adopt new agricultural technology; In the low-rise extension staff, it's unable to meet the requirement of development of modern agriculture and special agriculture in China because there are not enough full-time agricultural extension workers, and with aging knowledge and unreasonable personnel.

1.2 The different position of the different participants caused the worse extension effect

The different participants, including agricultural research institutions, educational institutions and agricultural science and technology enterprises, have the differing positions and uneven interests, which results in the serious separation between education and extension, research and extension and management and extension in agricultural science and technology extension.

There are four-more and four-less facts in the technology supply from Agricultural research institutions and educational institutions, e.g., there are more technologies in food crops, but less technologies in cash crops and a variety of operational aspects; more technologies in the middle of production process, but less technologies in processing; more conventional techniques, but less high-tech; more technologies in increasing production, but less technologies in increasing quality and efficiency. As the researchers have lack of full understanding to practical problems encountered by farmers in the production, resulting in the interests of farmers and the real needs of the technology embodied in agricultural research is difficult, it is difficult to ensure the promotion of research results. The current agricultural research institutes and agricultural extension agencies are two separate systems, Promotion Department mastered large amounts of information but can not be timely feed backed to the university research institutes and scientific research departments, and research results of research departments also can not be quickly converted.

The agricultural science and technology enterprises is an independent legal entity which is adapted to market forces to establish, self-financing, focusing on the marginal effect of investment has the feature of very selective and limitations on research and development of agricultural technology, which will inevitably cause not timely extension and promotion in some new technologies, new varieties and applications for short-term obvious lack benefits.

1.3 The rules and regulations of Agricultural Economic Cooperation Organization are not sound, operation and management are non-standard

"Regulations Governing the Registration Farmer Cooperatives", issued on May 2007, has made a clear definition for the nature of professional cooperatives to farmers: Agricultural Economic Cooperation Organization is a non-profit corporation aggregate organization. Its funds are from organized units and from related organizations donor funding, it is representative of the interests of farmers. However, in actual operation, because the different initiators and their types are not the same, there are many non-standard aspects. For the organizational structure, no member of the General Assembly, no Council, no Board of Supervisors of the Agricultural Economic Cooperation Organization is not a minority. For the interests of the connecting mechanism, most professional co-operation Organization and the interests of farmers are not closely connected, e.g. it is simply buying relationship and not enough protection to the interests of members; or it is not clear within the property and majority is dominant. For the internal management, the democratic management system of majority of specialized cooperative organizations is not perfect, finance is not an open, important matters is not by democratic voting, and so on. All these have hurt the farmers' initiative to participate in specialized cooperative organizations to improve the technical level and develop the agriculture. Some agricultural products trade association rules and regulations are not sound, lack of industry self-regulation, poor service, lack of credibility, then they can't get the recognition from farmers. How can stimulate and promote the self-organization of farmers, self-management, autonomous, self-development capacity, and increasing the farmers present and future material and spiritual benefits, but also improve the agricultural science and technology service system it's a critical issue at this stage.

1.4 Lower risk support for farmers, lag of extension and application for new technologies

The farmers are object of Agricultural science and technology extension services. Small-scale family agriculture is main mode in China, agricultural efficiency is lower, and educated, high-quality and young adults labor force in rural is shift to better efficiency of the secondary and tertiary industries by work outside of home. Mainly farmers who stay in rural areas are low cultural level, older, mostly women, partial conservative have lack of enthusiasm and initiative for application of agricultural science and technology. Most farmers are only willing to maintain a simple reproduction and is unwilling to invest too much money to adopt new technology, fear of market factors and the risks of natural factors, satisfied to obtain a stable low-income, resulting in delay of dissemination and application of new technology.

1.5 Lack of effective communication and collaboration between main bodies

Government departments and their respective agricultural research institutes bear most of the agricultural science and technology extension functions, allocation of resources rely mainly on his executive power to achieve, through administrative fiat way to ensure their normal operation, coordinating the demand is not high, the cost of the implementation is lower. In the diversity conditions of the main bodies, the coordination is the growing demand. But all kinds of main bodies are funds dispersed, scattered strength, the lack of unified planning, research and projects extension with lack of communion, communication and cooperation. We are still using a simple use of government regulation, ignored the application of market means and legal means, resulting in a number of inconsistencies between supply and demand, the phenomenon of waste of resources, then it greatly reduced operating efficiency of agricultural science and technology extension system, affected farmers support and trust in science and technology service system. If we do not strengthen the coordination and communication among the main bodies by a variety of coordinate ways, e.g. market-based instruments, administrative measures and legal means, to integrate resources, it will be difficult to achieve functioning efficiently of agricultural science and technology service system.

2. The proposals of optimizing the main body of agricultural science and technology in China

At the backdrop of actively promoting the construction of new countryside, China should emphasize different functions of different respective main body, at the same time, actively cultivate diverse main bodies, enhance the link between the participating main bodies and combination, exert the synergies of main bodies, to improve capacity and dynamic of agricultural technology extension. Concrete way can focus on the following five areas:

2.1 Actively promote the reform of agricultural technology extension agencies to promote the development of agriculture

After years of reform and exploration, agriculture science and technology services has clear directions that follow the separating services of public service functions and operating principle, strengthen the public welfare functions for national agricultural extension agencies, separate the general technology extension from business services, and follow market-oriented manner. With the new phase of "Promote agriculture through industry, Guidance rural by city", it can be reconstructed the public welfare Agricultural extension service system according to following two aspects.

First of all, we should have a clear functional positioning, and innovative operational mechanism. It can be restructured based on the existing institutional, or to explore ways to establish an agricultural technology extension agents which is an integration for research, education and extension services by rely on or joint agricultural universities, research institutions. Body's positioning and settings should be combined with China's characteristics and development of agricultural production to carry out the actual needs, and explore to build distinctive characteristics and efficient public welfare extension service network. While reforming the extension service system and nurturing diversity of main bodies, the agricultural science and technology extension mechanism should be established mainly through the market manner, but also administrative means and market regulation combined operation. Encourage extension agencies, research institutes, agricultural universities, agricultural science and technology enterprises to participate in fair competition in the form of technology extension and service.

Secondly, strengthen the team building; establish the mechanisms of supporting education and training. Achieve the changes from fixed employment to contract employment, from identity management to post management through project management, appointment, performance pay and other measures in all levels Agricultural extension agencies; strengthen agricultural extension personnel building by establishing an effective incentive mechanism and elimination mechanisms. Link the income to job responsibilities and job performance of Agricultural technical staff, attract graduates of agricultural colleges to enter into the agricultural extension services and increase the proportion of professional and technical personnel through to the implementation of the county agricultural technical staff wages preferential policies. Speed up the training a group of high-quality agricultural extension class middle-aged people through commission educated and undertaking a major extension projects, etc.. The agricultural sector does the work of agricultural professionals continuing education through professional training, regular training, on-site observation and other forms. The project as a carrier, relying on science and technology correspondent system, encourage and support agricultural science and education personnel taking part-time jobs in rural and agricultural enterprises under the premise

of completion of their duties. Through agricultural broadcasting, satellite TV education, seminars and so to improve the quality of the peasants. Thereby enhancing the professional competence of agricultural extension workers, farmers receive and the extent of application of new technologies, better adapt to the market and technological changes.

2.2 Serving the agriculture directly by developing the resource advantage of the agricultural scientific research and education unit

In recent years, scientific research institutes and agricultural colleges have been actively exploring and improving long-term mechanism of agricultural science and technology service system. Beijing, starting in 2006 launched the "college-town build a pilot for agricultural extension service system demonstration", try to explore the establishment of a professor of agricultural extension system, results are obvious. May consider the adoption of a specific project support, benefits link, etc., relying on technical superiority and talent advantages of universities and research institutes, to encourage and promote scientific research institutes and agricultural universities a more active participation in agricultural technology services, build a joint demonstration base in order to household demand as the goal, the implementation of the menu service, to provide prenatal, childbirth, postpartum services for farmers, to achieve production and research combined. Strengthen intellectual property protection of agricultural research personnel, conscious safeguard the legitimate rights and interests of agriculture technological innovation, promote the healthy development of the agricultural technology market and the quantity and quality of independent intellectual property rights in agricultural technology extension. Encourage scientific and technological personnel to form the economic interests of community with big agriculture and leading enterprises through financial shares, technology and other forms of equity, to implement risk-sharing and benefit sharing, this is not only to mobilize the enthusiasm of scientific and technological personnel, but also overcome the potential problems encountered in scientific research and shorten the conversion time. All these can enhance the level of agricultural production technologies and agriculture industrialization in China.

2.3 Promoting market-oriented operation management services and encouraging all kinds of agricultural science and technology enterprises involved in agricultural science and technology service

The government should encourage all kinds of enterprises to enter the field of agricultural technology service sector according to law, and to take sole proprietorship, joint venture, cooperation, project financing, etc., involved in grass-roots level extension services for business entities, infrastructure investment, construction and operations. Various types of enterprises, especially leading enterprises in agriculture, provide technical, training, information and other services by virtue of its own economic strength and technological capabilities to farmers, support development of various types of professional cooperative organizations in rural areas, build the connectivity of businesses and farmers, form the "enterprise + Cooperation Organization + farmer" mode of service, reduce transaction costs, improve operational efficiency. Therefore, we need to provide more policy support for such agricultural enterprises through the creation of a mechanism linking the enterprises and interests of farmers, development contract farming, building agricultural trade association, strengthening the agricultural market analysis, establishment of agricultural information dissemination and updating of systems to enhance survival and service capabilities. At the same time through the strengthening of laws and regulations and policy guidance, strengthen the market integrity of the main body awareness and sense of responsibility of agricultural science and technology enterprise. Propose industry self-regulation, promote a number of quality, reputation and reliable agricultural enterprises and products in accordance with law, and actively guide the peasant reasonable buy. Innovate and improve product Quality tracing system to ensure the realization of agricultural product quality can be traced back regulation. Establish the agricultural enterprise credit classification monitoring system. Establish the regulatory target credit files according to agricultural market main body qualification, commercial credit, contract compliance rates, compliance levels, consumer complaints, the public evaluation of relevant information, combining agricultural quality supervision and sampling results, then implement of the credit classification regulation, to avoid the failure of agricultural production into the field of agricultural commodities, unlawful agricultural science and technology enterprises damage the interests of farmers.

2.4 Agricultural science and technology extension services should respect the farmer's freedom of choice

Farmers are the subject of agricultural business, also subject of agricultural technology needs and market players. The adoption of new agricultural technologies should be a rational choice by market operation of farmers. A new mechanism should be established in which farmers can participate in the selection for dissemination of technology to change the traditional extension methods of combination technology demonstration and executive orders in past, to establish new extension ideas which is "farmer-centered," "bottom-up". Agricultural extension services should transfer the correct market demand information, and advanced technology to farmers in a timely manner and let them make his own choices, guide the voluntary adoption of new agricultural technology to millions of households. Respect the farmers' right to choose. It's the freedom of farmers whether they accept the new varieties, new technologies and new achievements and extension agencies should be no conditions attached. So that farmers obtain real right to choose, to mobilize farmers to adopt agricultural technologies initiative.

2.5 Perfecting extension platform for agricultural science and technology and playing a synergistic effect of all main bodies

Agricultural science and technology extension platform is based on the government agricultural extension agencies in the core, and scientific research institutes, agricultural colleges, agricultural science and technology demonstration bases, agricultural science and technology co-operation of enterprises and households as a model system. Closely link the multi extension main bodies through the platform and develop the agricultural extension services jointly, to promote integrating resources of extension and the formation of force purposes.

Improve the agricultural science and technology platform, use agricultural information of public service platform, establish and improve five level agricultural information network system of provincial, city, county, township and village, implement peasants on-line project, regular arrange the experts and technical staff on duty "Agriculture 110" hotline , provide booking services, consulting services and customized services for farmers, leading enterprises and professional co-operation organizations , provide the protection to quick and convenient to get the agricultural information for farmers, and promote the farmers increase production. A diversified input mechanism can be used for information platform, to form a "government-lead, public co-operation, market operation, telecom implementation" pattern. Meanwhile, use technology innovation platforms, to play an active role in innovation of enterprise business and agriculture research institutions, colleges and universities, to integrate scientific and technological resources, to promote the close integration of production and research. Through collaborative research, research and development a group of new varieties and new technologies which are suited to China's development of conservation-oriented agriculture, recycling agriculture and ecological agriculture, provide strong technical support for modern agricultural of development in China. The main bodies have the role of their own strengths in the process of agricultural science and technology extension, are indispensable. By strengthening the platform building, breaking the scattering of resources and fragmentation of the obstacles to the formation of the division of labor cooperation, mutual benefit and win-win synergy between the main bodies, result in synergies, improve higher conversion rate of agricultural scientific and technological achievements, promote the diversification of agricultural science and technology extension system. Therefore, Building an agricultural science and technology extension service mechanism based on synergistic theory as the theoretical basis is a reasonable choice to play the main role of main body in China's agricultural science and technology.

References

- Huang, Tianzhu & Yang, Hechai. (2007). China's agricultural science and technology collaboration between the multi-subject analysis. *Northwest Agriculture and Forestry University (Social Science Edition)*, Vol. 7, No. 6.
- Li, Weisheng. (2009). The building of China's diversified agricultural technology popularization system research. *China's scientific and technological achievements*, No. 2.
- Liu, Dong. (2009). *The exploration and innovation for new type of rural science and technology service system*. Chemical Industry Press, January, No. 1.