

TECHNICAL TASK FORCE: A PILOT PROJECT OF AGRICULTURAL SCIENCE COMMUNICATION IN CHINA

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Abstract

China is an agricultural country with 63.91% of its total population living in rural areas. As traditional agriculture is being gradually replaced by modern agriculture, low level of science literacy of Chinese farmers has considerably hindered productivity in the agriculture sector. As a consequence, the farmers are still poor, so it is crucial for Chinese farmers to learn modern agricultural methods in order to eliminate poverty. However, due to insufficient qualified personnel and lack of technical services, urgent needs of the farmers are not met. While agricultural technicians are locally available in large numbers, their knowledge has not been fully applied in agricultural practices; thus a big information gap exists between technicians and farmers. Therefore a proper communication channel and a cooperative guarantee system need to be established so as to pass on science and technology (S&T) information from the 'rich region' to the 'needy region'. With this background, a pilot Project of agricultural science communication has been launched. Based on 'Voluntary Registration & Mutual Selection', lots of technicians were hired by the local government as 'Technical Task Force (TTF)'. They lived and worked together with the local farmers. In their cooperative efforts they made technological as well as capital investment and share profits and losses to achieve 'double win' and then they both become shareholders. This pilot Project to persuade Chinese farmers to use modern scientific methods is so successful that the government is expanding it across the whole country. So far this Project has been tried and practiced in 267 counties across 23 provinces in China. This paper attempts to analyze the working mechanism of the innovative Project and discuss the relationships amongst local governments, farmers and TTF. The aim is to elaborate on an effective and successful practice of agricultural science communication between technicians and farmers in developing countries.

Keywords: Technical Task Force (TTF), pilot Project, agricultural science communication

I. Introduction

Science communication refers to the process of sharing S&T information among different partners. The purpose is to transfer the 'private knowledge' to 'public knowledge' thereby balancing the distribution of the information. It is quite normal that an information gap exists between the communicator and the receiver. Therefore a proper communication channel and a cooperative guarantee system need to be established to realize the effective distribution of the information resources.

China is an agricultural country with 63.91% of its total population living in rural areas¹. In 2004, the average annual net income of a Chinese farmer was \$363.13. They are still poor when compared to people in cities with the average net income of \$1165.33². Now traditional agriculture being gradually replaced by modern agriculture, Chinese farmers are

¹ National Bureau of Statistics of China, *China Statistical Yearbook of 2004, 2005*;

² National Bureau of Statistics of China, *Statistical Communiqué of the People's Republic of China on the 2004*

weak in acquiring and applying the new technology. Their low science literacy (0.7%³) has considerably hindered the productivity in the agriculture sector. It is crucial for Chinese farmers to learn modern agricultural methods so they can eliminate poverty. Insufficient qualified personnel and technical services cannot meet the urgent needs of the farmers. Due to the fact that a large number of agriculture technicians are kept in agricultural colleges, graduate schools and local governments, their knowledge has not been fully applied in agricultural practices. This has created a huge gulf between present agricultural innovation institutes and those who apply these technology - namely the farmers. A proper communication channel and a cooperative guarantee system need to be established in order to pass on S&T information from the “rich region” to the “needy region” and realize the main task of the agricultural science communication.

II. Background of Technical Task Force Project

For many years, Chinese government has been extending agriculture technology as public welfare. As China's economic system has been diverting from the planned economy to market economy, the traditional agriculture is also evolving to a modern one, but S&T serving system is lacking. The stagnancy in selling the agricultural products has become the most troublesome issue for Chinese farmers. Productivity in the Chinese agricultural sector is low. For this reason, it is very difficult for Chinese agriculture to move forward.

In 1999 the local government of Nan-Ping County in Fujian Province considering the needs of the local farmers, hired 255 technicians in its rural areas consisting of 215 villages, based on the principle of ‘Voluntary Registrations and Mutual Selection’.

During their stay in the rural region, these technicians made use of their own specialties to provide direct technological aids to the local farmers. They lived and worked together with the local farmers and made technological as well as capital investments in their cooperative efforts. They shared the profits and losses to achieve a “double win” strategy. They were called the Technical Task Force (TTF). Through directly joining in the funding, they themselves became shareholders and thus built up a multiple-formed ‘Interest Community’ with farmers. By these means, a new model for agricultural science communication came into being. The fire for pursuing prosperity has been lit in the poverty stricken areas of Southeastern China.

The farmers have warmly welcomed TTF, as it has achieved a remarkable success. In Nang-Ping County the gross output value rose from \$750 million in 1998 to \$1,256 million in 2002. The average annual net income of per farmer rose by 8.2%, twice as much as that of the whole Fu-Jian Province⁴. The society took notice of the ‘Nan-Ping Phenomenon’. Other provinces were showing great interest in this Project and the central government also thought highly of the work done in Nan-Ping. On December the 31st in 2004, Ministry of Science and Technology of China decided to spread this Project across the whole nation. Up to now, 267 counties in 23 provinces have started TTF Project⁵.

III. Interest Community-the core of TTF Project

National Economic and Social Development, February 28, 2005;

³ Science Popularization Press, *Public Scientific Literacy of 2003 in China*, May 2004 Release 1;

⁴ JIA Zi-wen, *Reports on the Development of Technical Task Force*, Ministry of Science and Technology of the People's Republic of China, March 2005;

⁵ JIA Zi-wen, *Reports on the Development of Technical Task Force*, Ministry of Science and Technology of the People's Republic of China, March 2005;

TTF Project has developed a brand new economic model for Chinese agriculture, which accounts for its success. A mutual 'Interest Community' is established between the TTF and farmers, who both shared the profits as well as the risks. Scale land and market-oriented management are practiced. As the case of the TTF Project conducted in Liao City demonstrates, it is an effective model for developing modern agriculture.

Liao City, in Shandong Province, is a city heavily relying on agriculture and can serve as a typical example of a large number of such cities in China. Farmers account for 80% of its total population. It is the first experimental city of the province to carry out the TTF Project. Starting in 2004, Liao City finds its own way out in practicing the Project, forming a trinitarian body of 'TTF+Farmer+Company'. The case of Liao City shows that the TTF Project has been efficient and effective.

3.1 Six patterns of the "Interest Community"

To take Liao City as an example, six patterns of the 'Interest Community' can be summarized as follows:

(1) Model of building Demonstration Park. The TTF, being partners and shareholders, funds and builds a Demonstration Park or manages the Demonstration Park under contract. Then they introduce new crops and apply new technology into practice. They thus set up examples for the farmers living in those nearby villages.

(2) Model of technology-paid service. The TTF cooperates with the farmers by supplying technological service and get paid accordingly.

(3) Model of financial investing. The TTF invests with the farmers to establish economical entities and get their dividends as rewards.

(4) Model of setting up S&T Agency. The TTF helps the farmers and cooperate with them by introducing new agricultural technology or providing agent service. They are provided with a certain amount of the profit as rewards.

(5) Gratuitous pattern. The TTF provides technological aids to the farmers for free.

(6) Reverse Contract Model. The TTF takes a patch of land under contract on which they grow crops or set up poultry farms. And then they rent the land to the farmers. They also supply technical instruction and charge the farmers for their service.

By means of the above six 'Interest Community' patterns, the TTF and the farmers share the profits as well as the risks. The enthusiasm of TTF is stimulated and motivated, and at the same time, the farmers' trust in the new technology is also enhanced. All this has contributed to productivity and efficiency. A large number of technicians are encouraged to work in the countryside.

3.2 Deconstruct 'Interest Community'-Reverse Contract Model.

Now I would like to elaborate more on the 'Reverse Contract Model' (6) in order to present the process of science communication under 'Interest Community'. The 'Reverse Contract Model' as a seven-step procedure, is illustrated in the following figure:

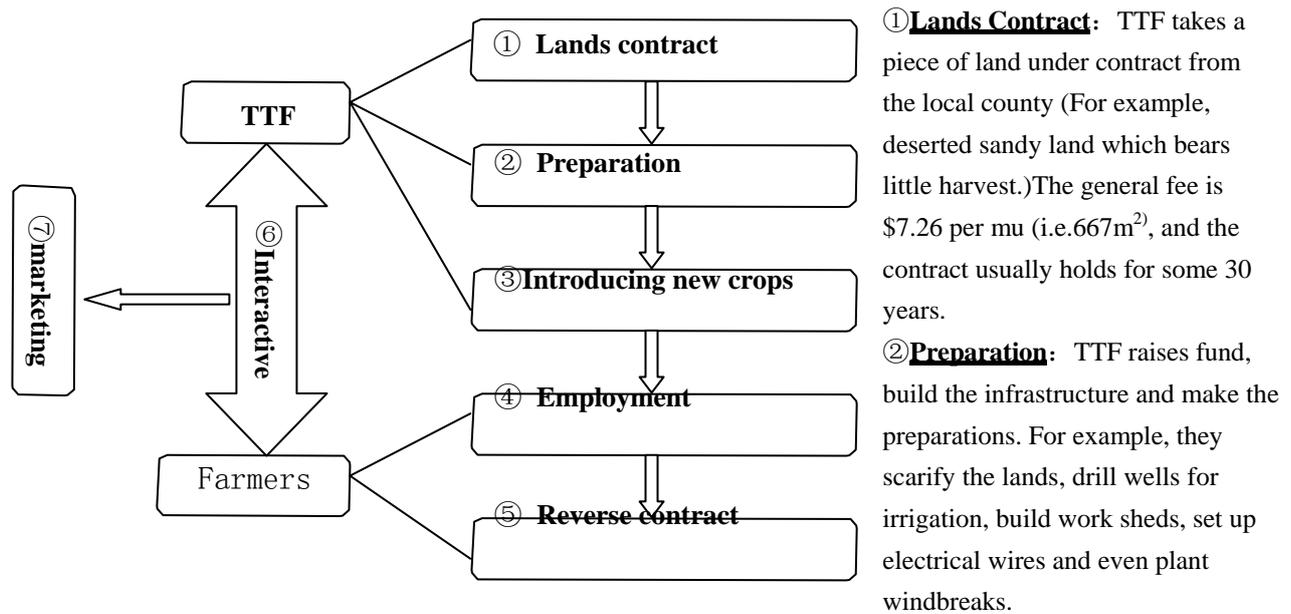


Figure 1. Seven steps in the 'Reverse Contract Model'

③ **Introducing new crops:** TTF introduces new high-quality crops and build a Demonstration Park/ Demonstration Base. They plant fruit trees or grow new crops and try to attract the attention of the farmers with the new technology. Thus they make the demonstration park a model for the local farmers to learn from.

④ **Employment:** Farmers work in the demonstration park as employees. TTF teaches them how to do the planting using scientific methods. The farmers experience the process and see the profits of the demonstration park with their own eyes.

⑤ **Reverse contract:** Reverse to ①, the farmers rent the lands from TTF under contract. Being given the technical instruction from TTF, farmers raise fund and manage the production by themselves.

⑥ **Interactive:** TTF provide their suggestions on production and management periodically. They train the farmers and give their instructions in fields. They also take the farmers out of their county to visit other successful farms to learn more.

⑦ **Marketing:** TTF invest and set up their own company to develop their own market. With TTF taking charge of marketing, farmers are exempt from the trouble of managing selling.

Up to November in 2005, in Liao City, 1,215 TTF found their ways into rural villages. 207 Interest Communities have been set up; 211 professional associations are founded; 34,000 farmer' families are involved; 741 types of new technology are spread; 827 new farming species are introduced; 327 agricultural programs are implemented⁶. As a whole, S&T has been successfully transformed into productivity and greatly increased the yield on the farm and the income of the farmers.

IV. The communication process of 'Interest Community'

The process of communication consists of five elements, namely communicator, content, channel, receiver and the feedback. According to the deconstruction of "Reverse Contract Model", if the above seven steps are analyzed in terms of communication theories, conclusions can be drawn as follows:

⁶ TTF Project Office of Liao City, Shandong Province, *Reports on TTF project of Liao City*, January 13, 2006;

4.1 Communicator -- TTF

The TTF is a representation of innovation. They are those who spread new technology. Being the specialists equipped with technology and management skills, the TTF communicates with the farmers in a face-to-face way. They provide relevant instruction and share with the farmers their personal experiences. They clarify the farmers' doubts or questions in time and get the feedbacks. Most of TTF are local people so that they are rather familiar with the local situations and they have a lot in common with the farmers. As a consequence, farmers are more likely to trust them, and then the communication of new technology becomes possible and easier.

4.2 Receiver – Farmers

They receive the new scientific knowledge and the technology. Although the farmers in general have low scientific literacy and are weak in accepting and applying the technology, they have a strong desire to increase their income and possess a strong motivation to work with TTF.

4.3. Channel – Demonstration Park

It is the place where TTF extend the new technology to the farmers and where interactive communication between TTF and farmers takes place; especially where farmers make their own decision to learn new knowledge and adopt new technology.

4.4 Feedback – Associations

The TTF founded kinds of associations and they take in farmers as members. The association organizes and gives lectures constantly to give technological instructions to farmers. Whenever the farmers have problems, they can come to the association for consultation.

It can be seen from above that the TTF extend the new technology to the farmers through the process of communication. In this process farmers make their own decisions to learn new knowledge and adopt new agricultural technology.

4.5 An innovation communication/diffusion

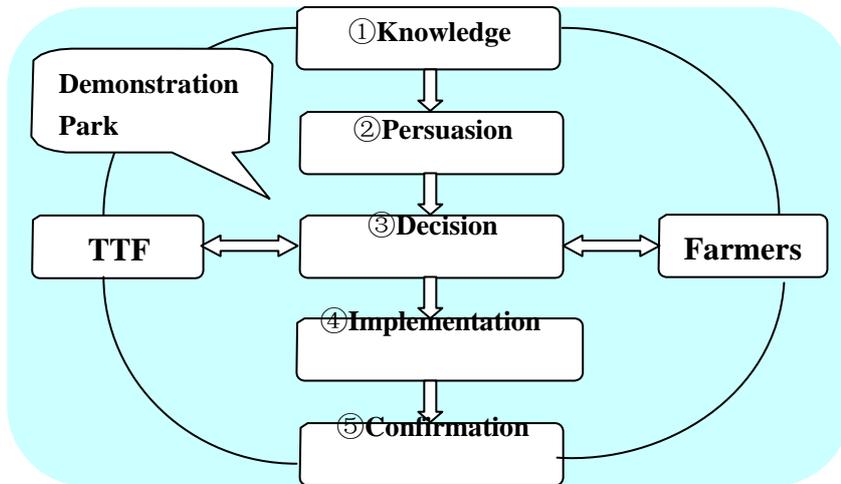
Diffusion is the 'process by which an innovation is communicated through certain channels over a period of time among the members of a social system'. An innovation is 'an idea, practice, or object that is perceived to be new by an individual or other unit of adoption'. Communication is 'a process in which participants create and share information with one another to reach a mutual understanding' (E.M. Rogers, 1995)⁷. The innovation communication/diffusion consists of five stages: knowledge, persuasion, decision, implementation, and confirmation⁸. Now I'd like to explain further the process of an innovation communication/diffusion, as shown in Figure 2:

① **Knowledge:** In the first place, the farmers are employed in the Demonstration Park as workers. They get to learn relevant technological knowledge, such as planting, cultivation or application of new tools. Farmers are thus given an opportunity to experience the power of S&T.

⁷ Rogers, E.M.: *Diffusion of Innovation* (4th edition). The Free Press. New York, 1995

⁸ [US] Werner J. Severin / James W. Tankard, Jr. : *Communication Theories : Origins, Methods and Uses in the Mass Media* Release 4, 2000, P.234;

- ② **Persuasion:** The TTF tries to persuade the farmers to adopt new technology or cultivate new crops.
- ③ **Decision:** The farmers make a decision of their own to rent the lands from TTF under contract and plant the new



- crops, applying the new technology they've acquired previously.
- ④ **Implementation:** The farmers manage the farming following the directions from TTF.
- ⑤ **Confirmation:** The demonstration park brings great profits. Consequently, more farmers will also show interest in planting new crops and applying new technology. Technological innovation therefore succeeds in spread to a wider extent.

Figure 2. An innovation communication model of TTF Project

To sum up, the analysis above shows that TTF Project is a new approach of science communication and of innovation communication in agriculture. It is transferring the traditional top-down one-way expansion organized under the administrative power into a two-way communication between TTF and the farmers. The farmers are no longer passive receivers; they experience the charm of science first; then learn to how to use it and finally they manage their farms by the new technology and make the profits along with TTF.

In this way, it not only enhances enthusiasm for the communicator and the receiver, but also gives the time for the farmers to digest and decide. This Project emphasizes the advantage of interpersonal/local communication, especially based on the mutual interest between the communicator and the receiver.

V. Evaluation

When a system is to be evaluated, a key point is to figure out whether it will bring long-term benefits. For a long time, the Chinese government and the relevant administrative sectors have been making efforts to develop effective programs to expand S&T to the local Chinese villages; 'Technology Expansion Caravan' is one of the examples. These activities have helped the farmers; however, the rate of application of new technology is still low. Furthermore, most specialists are unable to provide services for the farmers in remote regions, and therefore a vast number of farmers cannot obtain due training. TTF Project, however, could change such a situation and bring about positive effects.

First, it contributes to an increase of the peasants' income, and thus their living conditions can be considerably improved.

Second, scale land management helps enhance the agricultural productivity, which compensates for the lack of labor force.

Third, the introduction of new types of crops and the adoption of new technology elevate the level of scientific value in agricultural economy. The science literacy of the peasants is enhanced as well.

Fourth, the teaching as well as verbal instruction from TTF, the training in the association and the practice in the

Demonstration Park serve as a good educational chance for the poor-informed peasants. This also makes up for an insufficiency of vocational education and technical training in rural regions.

Fifth, The TTF brings the science research outcomes directly to the villages and to the peasants. Thus it shortens the length of the time for applying scientific research findings.

In short, The TTF solves the problems of technology and marketing. Following the directions given by TTF, the peasants are on the right track to become rich together with TTF. Just like what TTF proposed, ‘We show to the peasants, work with the peasants, and earn with the peasants’.

VI. Experiences and obstacles

In a real Chinese situation, TTF Project is a successful pilot case of agricultural science communication. It altered the current training or consultation program into an Interest Community model, which is expected to improve the economic situation in rural regions. It also differs from those short-term activities to spread technological knowledge to peasants; instead, it intends to change the shorted-term programs into long-term Projects.

Experience proves that TTF can and will demonstrate their special advantage in the work of science popularization. They set an excellent example for science communicators. Their core principles are summarized as follows:

First, the employment of TTF is based on the principle of “Voluntary Registration, Mutual Selection”. This improves the efficiency of human resource allocation. The former administrative order did not in fact take the peasants’ needs into consideration. The technicians’ special skills failed to be fully brought into play. By mutual selection, a better cooperation between the two parts can be found. So can be the allocation of resources.

Second, a guarantee system ensures that the title, occupation and salary will be reserved for TTF. The lifting of salary and title will not be delayed. All these measures make TTF feel willing to work hard for the Project without any reservation.

Third, a reward system is set up. TTF who makes a prominent contribution will be rewarded or get promotion. In this way, the enthusiasm of TTF is greatly aroused.

Fourth, a credit card system is conducted for TTF to solve their shortage of funding

Fifth, a special college is established for TTF to hold lectures to improve their practical ability. It is also a platform for TTF to communicate information as well as share resources.

In a word, TTF Project proves to be highly effective. Due to the fact that it is still on the beginning stage, some obstacles and deficiencies still exist. TTF faces a serious shortage of funding. Lack of funding severely hinders the expansion of the cooperative scale and the increased interest. Moreover, a long-term workable mechanism for the Project is still not set up. And the Project also lacks an effective evaluation system.

VII. Summary

It is one essential goal of China to develop into a “well-off society” and it is crucial to help farmers prosper, increase their income and eventually develop agriculture industry. Chinese people have been working hard for years to make

these goals come true. From the case study of TTF Project in Liao City, we can see that TTF Project is devised to poverty elimination

The case study in Lao City indicates that TTF Project is a workable model in building China's 'New Villages'. Thus it is promising to extend this model to more rural regions. The case of TTF Project is a breakthrough in the course of science popularization. Its strategies can be promoted, learned, and shared on opportune occasions for science and technology communicators and to be used in other regions than China.

ACKNOWLEDGEMENTS

I express my sincere thanks and gratitude to Zhao Li-xin, the officer of ISTIC (Institute of Scientific & Technical information of China), and Liu Tong-Kai, the vice head of S&T Bureau of Liao City for their sustained support and great help for my investigation trip to Liao City.

Thanks a lot for TTF and farmers of Liao City, Zhao Chao-hua, Liu Zhao-yong, Wang Yan-hong, Zhao He-xian, etc. for their cooperation and enthusiasm.

Many thanks are also due to my supervisor Mr. Li Da-guang for inspiring and enlightening me to work on this paper, and my best friend Qiu Jing for polishing my paper.

I am deeply thankful to PCST Network, PCST-9 organizing committee for giving me the Student Travel Award, and China Association for Science and Technology (CAST), China Research Institute for Science Popularization (CRISP), for funding me to attend this conference.

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