



**Studies in Sociology of Science**  
Vol. 5, No. 4, 2014, pp. 111-115  
DOI: 10.3968/5942

ISSN 1923-0176 [Print]  
ISSN 1923-0184 [Online]  
[www.cscanada.net](http://www.cscanada.net)  
[www.cscanada.org](http://www.cscanada.org)

## Current Situation of and Countermeasures for the Development of Rural Informatization in China

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Received 21 August 2014; accepted 24 October 2014  
Published online 26 November 2014

### Abstract

Over the past three decades, informatization in China's rural areas has gained some achievements in several aspects including the development of informational environment, the construction of infrastructure, information resources and the basic service system, as well as the application of information technology. Despite all the aforementioned achievements, some problems regarding organization and management, capital investment, talent cultivation, and farmers' consciousness of informatization remain to be solved. Based on the status quo of the development of rural informatization in China, this paper puts forward corresponding countermeasures to tackle the existing problems and these measures include actively engaging in the innovation of the system and mechanism, in the optimization of the rural information resources, in the improvement of the rural information service system, and in the pilot demonstration project and in the promotion of typical cases.

**Key words:** China; Rural informatization; Status quo of development and countermeasures

Niu, Q. Y. (2014). Current Situation of and Countermeasures for the Development of Rural Informatization in China. *Studies in Sociology of Science*, 5(4), 111-115. Available from: URL: <http://www.cscanada.net/index.php/sss/article/view/5942> DOI: <http://dx.doi.org/10.3968/5942>

### INTRODUCTION

Chinese rural information is an integral part of its national economy and information technology, is an important

force to build its information society. Over the past three decades, informatization in China's rural areas has gained some achievements in several aspects including the development of informational environment, the construction of infrastructure, information resources and the basic service system, as well as the application of information technology. Despite all the aforementioned achievements, some problems regarding organization and management, capital investment, talent cultivation, and farmers' consciousness of informatization remain to be solved.

### 1. DEFINITION OF RURAL INFORMATIZATION

Before 2005, rural informatization was widely referred to as agricultural informatization. And then, Liu Shihong first put forward the concept of "rural Informatization", and he pointed out that rural informatization is the idea that in the process of agricultural productive activities and social practice, advanced technologies, especially the communication technology and information technology, are widely used to promote the economic development and social progress of rural areas (Li, 2011). Li (2011) pointed out that rural informatization is a process where information resources are fully utilized and the information service system is well constructed by way of enforcing the building of information infrastructure such as radio and television network, telecommunication network and computer network in the countryside, to enhance information exchange and knowledge sharing and to promote the application of modern information technology into all aspects of rural production and social management and service in rural areas.

To put it another way, rural informatization is an extension of the concept of agricultural informatization. The latter is defined from the perspective of its industrial significance, namely "agriculture"; while the former is a more comprehensive concept which

not only emphasizes “agricultural development” but also the progress of the farmers and the development of the whole rural areas. In contrast to agricultural informatization, rural informatization is more scientific and more comprehensive. Therefore, as far as its connotation is concerned, rural informatization is the all-around informatization that applies the information technology to the rural areas. And it consists of the informationization concerning the consumption of farmers, the informatization of agricultural infrastructure, the informatization of agricultural science and technology, the informatization of agricultural production and management, the informatization of agricultural resource and environment, and the informatization of rural management (Li, 2011).

## 2. THE STATUS QUO OF RURAL INFORMATIZATION IN CHINA

Informatization has become an unstoppable trend of the historical development. Over the past three decades, informatization in China’s rural areas has gained some achievements, but at the same time many problems exist and remain to be solved.

### 2.1 Achievements in Rural Informatization

Since the late 1980s, China has obtained remarkable and unprecedented accomplishments in rural informatization, such as the optimization of informational environment, the construction of infrastructure, information resources and basic service system, and the application of information technology, to name just a few. And these achievements are listed in the following sections in a respective fashion.

#### 2.1.1 Ongoing Optimization of Informational Environment

The Chinese government attaches great importance to the development of rural informatization. Since 2004, the central government has issued nine consecutive “First policy documents” which have given great concerns to rural informatization. Take the first policy document in 2006 from the central government for example. This document clearly proclaimed the “active promotion of the rural informatization, the full utilization and integration of the information resources involving agriculture, farmers and the overall rural areas, and the focus on the projects in terms of comprehensive agricultural information service platform”. The economic situation has improved and the rapid economic growth has provided a strong financial support for the rural informatization.

Meanwhile, the income of the farmers has seen an increase. In 2009, the net income per capita of farmers broke through the threshold of 5,000 RMB, which constituted the drive for the improvement of the actual purchasing power. Socially, the enforcement of “Nine-year compulsory education” has greatly contributed to

the improvement of the scientific and cultural level of the rural population. There will never be a case where children cannot afford to go to school for shortage of money. The improvement of the scientific and cultural level further enhances the information awareness of farmers. And they come to accept the network and learn things from the Internet, helping to cultivate more talents. Technologically, the rapid advancement of modern information technology, the 3G (Third Generation) technology and the technology of the Internet of things in particular, have brought new opportunities for the development of rural informatization. What is more, the maturity of the Wireless Broadband Internet Access Technology has provided the technical support for dealing with the difficult access to the villages and households in the pastoral and remote poverty-stricken mountainous areas.

#### 2.1.2 Gradual Improvement of Informatization Infrastructure

Fruitful results with regard to the infrastructure of China’s rural informatization have been achieved with the full realization of “broadband access”. By the end of the year 2010, for instance, the national Internet Township ratio had reached 100%, and the ratio of the towns which had access to broadband connectivity had reached 98%. At the same time, the number of rural Internet users in China reached 125 million, accounting for 27.3% of the whole body of the netizens; “access to phone in every village” (which means that every village can have access to telecommunication) had been fully realized; “radio and TV coverage to every village” had also been basically realized, with the comprehensive coverage rate of broadcast, TV arriving at 96.78% and 97.62% in a respective manner, seeing an increase of 0.47% and 0.39% in contrast to the coverage rate in 2009 (*Report of the Development of Agricultural and Rural Informatization in China*, 2010).

#### 2.1.3 Fruitful Results in the Construction of Informatization Resources

The channels for gathering rural information continue to be diversified. By the end of 2010, China’s Ministry of Agriculture completed the construction of nearly 40 channels of information collections for the national agricultural system, and accomplished the deployment of over 8,000 outlets for information collection. Moreover, the agricultural website system had been further improved and the total number surpassed 31,108 in 2010 (*Report of the Development of Agricultural and Rural Informatization in China*, 2010). In addition, a number of important databases and service systems related to rural information have been set up, among which the telecom operators including China Mobile, China Telecom, and China Unicom have seen a big stride and have made undeniable contribution to the development of rural informatization. A new force suddenly rises and boosts

the development of rural informatization. For example, China Mobile's "Agricultural Information Platform" released the latest agricultural information to the farmers by means of text messages, which has provided great convenience for the majority of farmers to have access to consulting information, and has also effectively supplied the information resources for the villages and households.

#### **2.1.4 Establishment of the Information Service System**

In terms of the informatization in rural areas, the information service system for the farmers is becoming increasingly perfect accompanied by a formed pattern that "every county is equipped with institutions providing information service, every town possesses a station supplying information and every village owns an outlet disseminating information". By 2010, more than 80% of the county agricultural sectors had set up an agency dealing with information management and service supply. More than 70% of the towns had established information service stations with more than one million rural information service sites and over 700 thousand members managing rural information (*Report of the Development of Agricultural and Rural Informatization in China*, 2010). Different modes of agricultural information service has been springing up, such as the "hot-line for agricultural science" in Shanghai city, "easy access to agricultural information" in Guangdong Province, and the "pyramid pattern" in Gansu province, and they have been the role models in the modes of information service. With the entrance of China Mobile, China Unicom and China Telecom into the rural market, the information service mechanism, which is based on governmental guidance, social participation and market operation, is being shaped.

#### **2.1.5 The Application of Information Technology in Agricultural Management**

Technology is the key factor in the development of rural informatization in that the development of informatization is nothing without technology. Information technologies, especially 3G technology and the Internet of things technology, have been made use of in cultivation, horticulture, livestock breeding, aquaculture, agricultural products market and social management, not only improving the labor productivity, but also promoting the progress of rural society and changing the traditional agricultural farming methods.

### **2.2 Problems Concerning the Development of Rural Informatization**

China has made some achievements in the construction of rural informatization, but there are still many problems, such as the irrational development caused by the intersected management system, the large shortage of funds resulting from the single investment of the government, the "last one kilometer" problem and the

impediment of the information technology promotion due to the low cultural level of the rural population.

#### **2.2.1 Inadequate Vigor in Rural Informatization Caused by Intersected Management**

The construction of rural informatization is a task that involves the collaboration of various departments, mainly including the Ministry of Agriculture, Ministry of Information, Ministry of Commerce, so on and so forth. That is the reason why in the course of development it will inevitably be affected by all the departments concerned. In so doing, various measures can be taken simultaneously and a multi-pronged approach can be adopted to solve one problem. This pattern is in a position to increase the impact and inject great vitality to rural informatization, but the dark side of this pattern is that there is likely to be inevitable bull management and unclear responsibility for the parties concerned, resulting in repeated construction and a enormous waste of manpower, financial and material resources.

#### **2.2.2 A Large Funding Gap Resulting From the Single Investment of the Government**

Rural informatization requires a lot of money, especially when it comes to the construction of infrastructure. A complete dependence on the financial support from the government will not merely put great financial burden on the government and but may also make the informatization construction abandoned half-way due to the lack of funds. In spite of the fact that some telecommunication operators have the intention to vigorously develop the rural market, there is a long way to go for them to fully realize the rural informatization, and the return cycle (for them to make big profits) is relatively long. Therefore, when it is hard for the enterprises to make money for a long time, they will certainly withdraw funds from the rural market in that their fundamental objective is the pursuit of profit. In this sense, the withdrawal of funds from the rural markets will ultimately pose a threat to the development of rural informatization.

On the other hand, the contradiction between the high cost of rural informatization and low economic level constitutes a restriction in the progression of rural informatization to a certain extent. The construction of informatization in rural areas not only contributes to the construction of the new socialist countryside and the improvement of the rural service system, but also helps farmers to widen their horizon and helps to train the modern farmers and to enhance their ability to get rid of poverty. However, the average income of farmers in China is not high, while the information costs are relatively high. In addition, influenced by the limit of their knowledge and their attitudes towards the informatization, most farmers do not want to pay the information cost. All these have restricted the entry of information into every village and into every household to a certain degree.

### **2.2.3 Insufficient Development of Rural Informatization Caused by “the Last One Kilometer” Problem**

“The last one kilometer” refers to the distance of the information spread from the towns to the villages. As a matter of fact, there is sound development of the construction of rural informatization in the county as the government attaches much importance to the process, but down to the township level, the rural informatization is far from ideal, and further down to the villages the situation is from bad to worse. Generally speaking, very few villages are equipped with information service station and have much fewer information collectors and managers. Due to the fact that most of the rural areas in China are affected by topography, especially in the central and western regions, it is very hard for the villages and households to have access to information due to the random distribution of the population. Although part of the technical problem concerning “the last one kilometer” has been solved, there is a very long way to go before the government is in a good position to fully solve this problem.

### **2.2.4 Promotion of Information Technology Hindered by Low Cultural Level of Farmers**

The cultural level of the rural population is still very low. In rural areas, the young people who are willing to accept the new knowledge are mostly migrant workers, and the middle-aged people can accept the new basic knowledge, while it is hard for the elderly people to accept new knowledge. Despite the implementation of the national nine-year compulsory education, only adolescents can benefit much from it and educational level of the older farmers has not been improved because of the historical reasons. Especially in some poor areas of western China, most farmers have only attended primary school. The low cultural level limits the farmers’ use of information technology. Although many farmers have access to a computer and a telephone, they do not know how to use the computer and how to send text messages, constraining the promotion of the information technology in rural areas, not to mention the more advanced 3G technology and the Internet of things technology.

## **3. COUNTERMEASURES FOR RURAL INFORMATIZATION IN CHINA**

Rural informatization is the important support and guarantee for China’s development of modern agriculture, and it is in a good position to bring about a sharp increase of the agricultural productivity, to promote a full utilization of agricultural resources, and to realize the integration of all the three industries. It has very important practical significance to increase farmers’ income and to improve the livelihood of the rural population.

### **3.1 Actively Engaging in the Innovation of the System and Mechanism and Creating a Good Environment for Rural Informatization**

The construction of rural informatization infrastructure should be strengthened; the domestic telecom operators should play a bigger role to speed up the development of rural informatization; laws and regulations relevant to rural informatization should be put forward and relevant working system be established and improved; more capital should be invested in the rural market, and a diversified investment and financing mechanism should be established; measures should be taken to improve the cultural level of the rural population and their information literacy so as to gradually train more well informed farmers in the rural areas and pay more attention to the development of cultural and spiritual civilization in the process of rural informatization; besides, a strong leadership should be established to facilitate the organization and coordination of the informatization work; moreover, all kinds of professional associations should be made full use of or be depended on to promote the sound development of rural informatization.

### **3.2 Optimizing the Rural Information Resources, Speeding Up the Construction of the Information Resource and Integrating Various Efforts in Rural Areas**

The research and development of rural database should be strengthened; the database resources could be enriched by increasing the video, audio, multimedia database; a system of the development of multilevel information resources is to be gradually established; the building of the standard system of rural information collection and the release of information system should be accelerated; the standard database interface must be provided; furthermore, the data gathering, processing, release integration should be fully realized. Moreover, the relevant departments should adhere to the “sharing” principle to speed up the resource integration, the rural information resources, to provide reliable guarantee for the country’s overall development of rural modernization and to raise the level of rural science and technology.

### **3.3 Gradually Improving the Rural Information Service System**

We should establish and improve information service organizations in the towns as well as in the villages. For example, we can build information service stations in the towns and establish sufficient numbers of outlet providing information service in the villages. We can rely on the Modern Distance Education Network for the party members and cadres and all kinds of rural information platforms to vigorously carry out the training of information technology for the farmers to cater for the demands or needs of the farmers and to improve their “information literacy”.

### 3.4 Pilot Demonstration Project and Promotion Work of Typical Cases

In China, rural informatization is still not mature, many parts of the country do not have too much experience, and they need ongoing exploration and practice. We should encourage and support qualified research institutions and enterprises to provide information services to research, as well as to develop information systems and end products with higher quality, lower costs and greater user-friendliness and easier maintenance. Moreover, we should vigorously promote the rural information plans which will bring obvious economic and social benefits and is characterized by the high rate of utilization.

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### CONCLUSION

The development of rural informatization corresponds to China's national conditions and caters for the needs of the rural population. It can truly benefit the farmers, the vast rural areas and the whole country. Moreover, it is a deserving career of the country to comprehensively realize rural modernization and network, to create new socialist countryside, and to build a comparatively well-off society.

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