INFORMATION SERVICES IN RURAL CHINA
FIELD SURVEYS AND FINDINGS
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Zhong Yongling

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FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS
REGIONAL OFFICE FOR ASIA AND THE PACIFIC
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FOREWORD

China's agricultural sector has been in a period of rapid growth and change since the late 1980s. Economic liberalization and adjustments towards a market economy, in particular its membership in the World Trade Organization, have subsequently created the need for technical change in information development and management. Agricultural technologies and agro-management practices must answer not only to these new market demands and export opportunities but also to poverty alleviation, food security and environmental concerns.

In response, the Ministry of Agriculture developed the Action Plan for the Programme of Rural Market Information Service during the Period of the Tenth Five-Year Plan. This plan emphasizes the development of human networks as well as technology networks to supply information to rural agricultural communities. It focuses on the creation of content appropriate to farmers and rural communities, integrating traditional as well as modern information and communication technology (ICT), improving both horizontal and vertical linkages within the information network, meeting the growing demand for information from rural communities and also supplying better information to the government for making policy decisions.

The importance of developing the human network to support the new technology and information to be made available has been stressed in China, with training and distance education as a key element. In addition to modern ICT, it is recognized that various traditional media and communication technologies also continue to contribute significantly in providing information to farmers. In particular the roles of television, radio, CD-ROMs and newspapers are emphasized in rural areas.

In reviewing the Ministry of Agriculture's achievements, the researchers conducted field surveys (the specific case studies will be published on the FAO Web site) and built conceptual models for information and communication networks. The case studies and models will enable other locations within China to choose and model their own development according to their own situation and implement the same to improve rural livelihoods. This study also complements FAO's other collaborative activities in China to enhance the positive effect of ICT for development, expanding information management capacity, augmenting technology dissemination and strengthening distance education.

Beyond China, these case studies will also serve as models for other developing countries. Indeed, this study serves a broader goal, as a cornerstone of FAO's activities in Asia and the Pacific under the new strategic initiative to “Bridge the Rural Digital Divide” (http://www.fao.org/gil/rdd). This initiative arises from the need to recognize that the information revolution has completely bypassed nearly one billion people, in particular the rural poor. The advent of ICT has served only to widen the gap between them and others who do have access to such technology. The rural digital divide in China is clearly evident when comparing the disparities between urban and rural communities, particularly those in the Western China region, men and women and between successful farmers and their less successful neighbours. FAO and its partners, including the Ministry of Agriculture, are working on an integrated set of activities to bridge the rural digital divide by strengthening human and institutional capacities to harness information and knowledge more effectively.

He Changchui
Assistant Director-General and
FAO Regional Representative for Asia and the Pacific
PREFACE

With further Chinese reforms, opening-up policies and the enhancement of the level of market orientation, the development of agriculture and the rural economy has resulted in a stronger demand for information services. This demand has aroused the Chinese government's attention. In response, the government has formulated a series of policies and has achieved significant results in establishing rural market information systems and information services. A rural market information service network has been set up. The network covers provinces, cities, counties and most townships in the Chinese mainland and links the leading enterprises of agricultural industrialization, agro-product wholesale markets, intermediary organizations and large farmer households of business operations.

FAO gives close attention to the remarkable results in Chinese rural information services and has collaborated with the information centre of the Ministry of Agriculture to conduct case studies of rural information services in 2003. The researchers conducted field surveys in four counties, one city and one district with various economic development levels, various predominant agricultural products and different ways of disseminating information. This report highlights three information service models. It also puts forward the key points to replicate in each model and offers suggestions to further strengthen information services through both macro and micro policies. The findings have not only played constructive roles in conducting rural information services but are regarded as useful to other developing countries and regions.

However, rural information services still face a number of common difficulties in China, including human resource shortages and capacity and technological constraints, insufficient content, limited funding, low quality and an imbalance of available information services. The Chinese government has launched an e-government project and will take more effective measures to promote rural information services. We also hope to continue strengthening cooperation and exchange with the international organizations and the developing countries concerned to share experiences in information services and jointly promote the development of world agriculture and the rural economy.

Zhang Yuxiang
Director General
Department of Market and Economic Information
Ministry of Agriculture
People's Republic of China
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Meng Xianli of Beijing Urban and Rural Economic Information Centre assisted in drafting this report. I prepared the case studies for Jinyun county and Lanxi city, Zhejiang province, and Fuyu county in Jilin province. Zhang Kuilin of the Information Centre of the Ministry of Agriculture of China drafted the case studies for Wuhu and Shucheng counties in Anhui province, while Meng Xianli completed the case study for Litong district of Ningxia Hui Autonomous Region.

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EXECUTIVE SUMMARY

The government of the People’s Republic of China has formulated a series of policies in agricultural information services and tried several approaches in delivering information services to rural areas in order to develop its agriculture and rural economy and to facilitate production, business operations and farmers’ income growth. Some of these approaches have produced important achievements and captured the attention of the Food and Agriculture Organization of the United Nations (FAO). To analyse the experiences in order to improve information services and identify the more effective and easy-to-replicate models for use in other regions of China or even other developing countries, FAO commissioned the Information Centre of the Ministry of Agriculture to set up a study group. This group of researchers conducted field surveys during the first half of 2003 in four counties, one city and one district: Jinyun county and Lanxi city of Zhejiang province, Shucheng county and Wuhu county of Anhui province, Fuyu county of Jilin province and Litong district of Ningxia Hui Autonomous Region (the specific case studies will be published on the FAO Web site).

After analysing the survey results, the researchers identified three successful information service models to be presented as good practices for possible replication. These three are characterized as:

1. **Service station model.** This is an information service centre located in counties, townships and villages that together form a three-level rural information service network. Each station relies on county agriculture bureaus, township agricultural technological service stations, agricultural economic management stations, cultural stations, large farmer households in crop farming and animal husbandry, specialized farmer associations and leading agro-enterprises for support in funding and content;

2. **Farmers’ home model.** The farmers’ home is established as an independent and open agriculture service facility integrating the functions of agricultural technology consultation, agro-technological extension, information services and business operations. It combines agro-technological extension with information services and provides essentially a “one-stop” service; and

3. **Association model.** This type of organization is operated autonomously by farmers with a common interest, such as growing a specific crop or raising certain animals, and the information services provided relate to that common interest, such as the Boer Goat Association. The associations provide their members with information on technology, crop seeds or animal breeds, production materials and marketing and related information services. A comparison of the three models renders the following features:

- **Users:** The farmers’ home model has the broadest reach to users, which includes farmers, enterprises and specialized farmer associations in the area where the farmers’ home is located as well as producers and agro-business operators in the vast rural areas outside the area. As the local government supports the operation of the service station model, the users typically include producers and agro-business operators of agricultural products from the local community. The association model differs considerably in that its service is targeted at a very specific group of users in agriculture who produce similar products and who are members of the association.

- **Content:** The service station model usually provides only advisory information services to farmers, while the content involves various agricultural production technologies, market details, demand and supply of products and policy information. Some service stations also provide marketing services in seeds, pesticides and fertilizers. The association model content focuses on production technology and market information of a particular group of products the members
produce. At the same time, it also organizes centralized procurement of some production materials and marketing of agricultural products. At the farmers' home, farmers can get advisory information on agricultural production and management as well as purchase agro-production materials.

- **Major actors:** The establishment, operation, development, input and management of the service station system and farmers' home are strongly backed by agricultural administrative departments of local government; associations are autonomously managed and operated by farmers. Consultation groups involving experts from the agriculture, forestry, water conservation and other agriculture-related bureaus with strong technical strength have been established in the service station and farmers' home to respond to enquiries. Compared to the association model, the service station and farmers' home involve more human resources and technological and management advantages that can fully tap agricultural technological talents in the governments at various levels. But as the specialized associations focus only on the study and development of the market of a particular product, and thus have very good knowledge about the market and rather complete information about that particular product, they then have more advantages for market development compared with the other two models.

- **Funding:** The service station and farmers' home rely more on the support of government funding and hence have advantages in terms of financing. The association depends more on the economic profits made by selling agricultural production materials to farmers to cover its expenditure.

- **Geographic distribution:** Service stations and associations are located in the rural areas close to farmers and are convenient to farmers seeking assistance. The farmers' home is located in towns at a somewhat long distance from farmers.

- **Costs:** The establishment and operation of the service station and farmers' home greatly depend upon the financial support of government. Since the association is a civil organization voluntarily established by farmers, the operating costs are relatively low.

The various information services rely on computers, the Internet and other modern information dissemination resources as well as traditional information dissemination avenues such as television, radio, telephone, publications, briefing notes and blackboards.

Summarizing the reasons for the success of the three information service models highlighted in this report, the researchers found first that the quality of information service does not completely depend upon local economic conditions. What is more important is awareness of the local government about the need for a service and what is involved in providing it. In the surveyed areas where the economy is not well developed, the local government understood the importance of an agricultural information service and issued supportive policies and adopted measures to promote the creation of a service system. Local official support is one of the keys for the success of the three models selected for this report; where these models of information service are found, local officials had recognized that an agricultural information service is a public welfare endeavour. Even with financial difficulties, local governments managed to allocate funds to facilitate the rapid setting up of an information service network at the county, township and village levels.

Second, the researchers noted how attention was given to exploration, integration and utilization of existing information service resources. The information service consultation committee in two
of the models consists of specialists from agriculture, forest, water conservation and business administration who can respond to the diverse demands of farmers. The agricultural information service agencies provide services targeted at rural areas and farmers through active collaboration with television stations, newspaper and periodical editors and the agricultural television and broadcast school.

Third, the researchers noted that the quality and enthusiasm of information service workers are continuously improved to more effectively and accurately respond to farmers' information needs and provide knowledge and information that can have impact on the success and growth of farmers' businesses as well as the local economy.

Information dissemination practices in rural China have proven that the development of a rural information service system that government promotes realize more substantial achievements and are endorsed by officials at grassroots organizations, enterprise managers and farmers. However, rural information services in some areas still face a number of difficulties, including human resource shortages and capacity, technological constraints, insufficient content and limited funding. The physical networks and organizational capacity of services need to be established and improved in many areas. The exploration and development of information content and the improvement of information service quality need to be further studied and promoted.

Looking at the demand side of information, the researchers concluded that it is very difficult for information services to produce large scale effects because of the current low levels of organized farmers, market orientation in rural areas, agricultural industrialization and specialization. Where there is little profit from agriculture and/or where farmers have lost their enthusiasm for agriculture, there results an insufficient demand for information and existing information resources are underutilised. Along with strengthening the provision of information services, the need to improve the organization, agricultural production specialization and industrialization levels to stimulate the demand for and guide the consumption of information must be addressed with great effort in rural China.
1. INTRODUCTION

1.1 Background

With the rapid development of information technology and ever-sharpening competition in the global economy, many governments attach great importance to the dissemination of information, or information services, and the application of communication technology in the field of agriculture. Information and network technologies are used extensively in developed countries and many developing nations now actively promote the spreading of market information services throughout their rural areas.

As the People’s Republic of China is experiencing a new development stage, marked by its accession to the World Trade Organization (WTO), people in agriculture and rural areas now seek a wide range of information. To strengthen the development of rural market information systems and information services, the Chinese government produced several policies, including the proposed Outline of the Tenth Five-Year Plan for National Economic and Social Development and the Action Plan of Rural Market Information Service during the Tenth Five-Year Plan period, which were launched in 2001 (through the Ministry of Agriculture). Corresponding policies also were generated in provinces (municipalities and autonomous regions) to implement the central strategies and promote information services systems in rural areas.

A rural market information services network connecting provinces, cities, counties and the majority of townships gradually has been established and links the leading enterprises of agriculture, wholesale markets, intermediary agencies and large households of production and business operations. Many locales stress the roles of the news media, agricultural socialized service organizations, the agricultural television and broadcast school and the Internet. Efforts also have been made in human resource development to further stretch the dissemination network to townships and villages and facilitate a wider flow of market information. The different delivery methods of information are achieving good results and are popular among farmers.

These methods recently captured the attention of the Food and Agriculture Organization of the United Nations (FAO). To analyse the different methods as a way of identifying gaps and enhancing the strengths and thus create models for other regions of China and possibly other developing countries, the FAO established a study group through the Information Centre of the Ministry of Agriculture in January 2003. The study group researchers conducted surveys and drafted case studies of the various information services in rural China.

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1 The government of China is encouraging multi-organizations, which include NGOs, village collective economic organizations, township agricultural technology, economic management, agricultural machinery, planting protection, forestry, water conservation and animal husbandry stations, as well as agricultural science, research and educational organizations and specialized associations and cooperatives, to offer services to farmers on agricultural technology, education, market information, etc.

2 Agricultural broadcast and television school is the short name of the Central Agricultural Broadcast and Television School of China, which has many branches at province and county levels throughout the country.
From March to April 2003, the researchers designed the enquiry, collected basic data and conducted field studies in four counties, one city and one district in four provinces. After careful sorting, analysing and expert consultation, this comprehensive report was prepared, detailing and comparing the three main methods, or models, of information dissemination in China's rural areas.

1.2 Objectives of the study

By looking at a small variety of locales in rural China, the researchers aimed to achieve the following three objectives:

1) Assess the current situation of information services in a portion of rural China

To gain an in-depth understanding of the status of the current information services, the researchers wanted to look at how the services are organized in the sample areas (including human resources, software, hardware and connectivity of the network), funding sources and costs of providing information, content, farmers' information needs and the impacts generated.

2) Identify successful information service methods

By looking at how different methods were developed and their current status, the researchers planned to present models of methods that could be suitable for a variety of agricultural areas with varying economic development.

3) Provide useful references for replicating the good practices

By analysing the successful methods and the factors contributing to the success and by comparing the advantages and disadvantages of each, the researchers wanted to provide models of information services that could be established elsewhere.

1.3 Methodology

Because the study involves both social and natural sciences with a broad spectrum of fields, there were many challenges. To ensure smooth access and quality research, the study group adopted a participatory approach with the involvement of relevant actors from central, provincial, city, county (district), township and village organizations and specialists, government officials, grassroots information service workers, managers of rural enterprises and farmers. The researchers combined theoretical and substantive evidence studies and quantitative and qualitative analysis to achieve in-depth understanding.

Four criteria determined the sample areas: 1) Varying economic development levels must be represented. At present, the economic development level in China decreases from the eastern regions towards the central and even more to the west regions of the country; 2) Various predominant agricultural products must be represented. Agriculture in the southeastern part of the country is dominated by vegetables, fruits, tea and other cash crops, silkworm raising and fisheries; the northeast is the major grain production area of the country; the central eastern region is a significant producer of grain, cotton and oil crops; while fruits, livestock and other unique products dominate agricultural production in the central and western regions; 3) The methods should be relatively successful; and 4) The methods should differ in the way they disseminate information.
Based on those factors, the researchers settled on the six sites for their studies, as shown in Figure 1: Jinyun county and Lanxi city in Zhejiang province in the southeast; Fuyu county in Jilin province in the northeast; Wuhu and Shucheng counties of Anhui province in central eastern area; and Litong district of Ningxia Hui Autonomous Region in the western area.

A combination of static and dynamic methods was adopted to collect the data. Prior to the field studies, the researchers collected relevant data on China and the sample areas through the Internet, newspapers, periodicals and questionnaires sent to research sites in advance. While in the field, the researchers visited county administration departments and service provision agencies, townships and village officials, farmer households, leading enterprises and specialized associations of farmers. As well, they organized a number of discussion sessions with government officials, information service workers and users and nonusers of information services. The researchers also used a questionnaire survey with many farmers in an attempt to assess the degree of satisfaction that they attributed to the information services in their area.

Once the field studies were completed, the researchers relied on telephone and e-mail communication to clarify issues or obtain more details. As well, they followed up with supplementary studies to confirm ideas and acquire more accurate and detailed information and materials from grassroots information service agencies.
A method of combining horizontal and vertical comparison analysis was used to identify common features and analyse the reasons contributing to the success of the service models and the difficulties and challenges faced by each. To help practitioners and anyone else interested in establishing an information dissemination service, key issues have been highlighted in this document to aid in replicating the three different models.
2. **FINDINGS**

2.1 **Overview of the sample areas**

<table>
<thead>
<tr>
<th>County</th>
<th>Primary school and lower</th>
<th>Junior middle school</th>
<th>Senior middle school</th>
<th>College and above</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jinyun</td>
<td>6.3</td>
<td>68.8</td>
<td>25</td>
<td>0</td>
</tr>
<tr>
<td>Lanxi</td>
<td>5.9</td>
<td>35.3</td>
<td>58.8</td>
<td>0</td>
</tr>
<tr>
<td>Shucheng</td>
<td>33.3</td>
<td>40</td>
<td>26.7</td>
<td>0</td>
</tr>
<tr>
<td>Wuhu</td>
<td>5.1</td>
<td>59</td>
<td>33.3</td>
<td>2.6</td>
</tr>
<tr>
<td>Fuyu</td>
<td>12.9</td>
<td>52.9</td>
<td>27.1</td>
<td>8.2</td>
</tr>
<tr>
<td>Litong</td>
<td>12.2</td>
<td>77</td>
<td>10.8</td>
<td>0</td>
</tr>
</tbody>
</table>

People in agriculture account for more than 80 percent of the total population in the five counties and for 66 percent in Litong district (Table 2).

<table>
<thead>
<tr>
<th>County</th>
<th>Population Agricultural Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jinyen</td>
<td>43 39.76</td>
</tr>
<tr>
<td>Lanxi</td>
<td>56 47.6</td>
</tr>
<tr>
<td>Wuhu</td>
<td>98 75</td>
</tr>
<tr>
<td>Shucheng</td>
<td>54 68</td>
</tr>
<tr>
<td>Fuyu</td>
<td>30.3 20</td>
</tr>
<tr>
<td>Litong</td>
<td>68 68</td>
</tr>
</tbody>
</table>

All areas are not economically well developed. The per capita net income of farmers in Jinyun county and Lanxi city in 2002 was lower than the average of US$596.80\(^3\) in Zhejiang province. The western regions in China belong to the least developed area; the per capita average net income of farmers in 2002 in Ningxia was US$231.60. However, Litong district is located in the central part of the plains area of Ningxia with rather good conditions for irrigation, and it has been historically a high yielding and good quality agricultural production area. Thus, Litong is the core area of

\(^3\) The official exchange rate was roughly 8.3 Yuan Renminbi to US$1 in 2002.
economic development in Ningxia and the average income of its farmers in 2002 was US$377.40, relatively higher than other areas of Ningxia (Tables 3a and 3b).

Table 3a: Per capita average net income of farmers in the sample provinces and autonomous region in 2002 (US$)

<table>
<thead>
<tr>
<th>Province</th>
<th>Average Net Income (US$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zhejiang</td>
<td>596.8</td>
</tr>
<tr>
<td>Jilin</td>
<td>285.3</td>
</tr>
<tr>
<td>Anhui</td>
<td>255.9</td>
</tr>
<tr>
<td>Ningxia</td>
<td>231.6</td>
</tr>
<tr>
<td>National Average</td>
<td>299.1</td>
</tr>
</tbody>
</table>

Table 3b: Per capita average net income of farmers in the sample counties and district in 2002 (US$)

<table>
<thead>
<tr>
<th>County</th>
<th>Average Net Income (US$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jinyun</td>
<td>355.1</td>
</tr>
<tr>
<td>Lanxi</td>
<td>459.1</td>
</tr>
<tr>
<td>Wuhu</td>
<td>337.1</td>
</tr>
<tr>
<td>Shucheng</td>
<td>275.4</td>
</tr>
<tr>
<td>Fuyu</td>
<td>314.1</td>
</tr>
<tr>
<td>Litong</td>
<td>399.4</td>
</tr>
</tbody>
</table>

Regarding information facilities, most people surveyed for this report own a television; its frequency rate among the 268 households in all the study sites reached more than 80 percent. The second most common device was a fixed telephone in households, with a frequency rate of more than 20 percent (Table 4a, although the survey was not conducted in Litong district and thus the data is not available). Very few farmer households had a computer; the highest concentration was found in Lanxi city where farmer households with computers accounted for only 0.5 percent of the total number of farmer households surveyed (Table 4b).

Table 4a: Information tools owned by farmer households

<table>
<thead>
<tr>
<th>County</th>
<th>TV</th>
<th>Telephone</th>
<th>Mobile Phone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jinyun</td>
<td>90</td>
<td>40</td>
<td>3</td>
</tr>
<tr>
<td>Lanxi</td>
<td>98</td>
<td>92</td>
<td>5</td>
</tr>
<tr>
<td>Wuhu</td>
<td>100</td>
<td>51</td>
<td>16</td>
</tr>
<tr>
<td>Shucheng</td>
<td>95</td>
<td>50</td>
<td>30</td>
</tr>
<tr>
<td>Fuyu</td>
<td>80</td>
<td>20</td>
<td>3</td>
</tr>
</tbody>
</table>

Note: Survey was not conducted in Litong district.
From the different practices studied in the six areas, the researchers identified three models of successful information service networks that could be replicated elsewhere.

- **Service station model**
  The “service station” model refers to an information service centre that is government driven and provides a little bit of information on a wide range of topics – everything that is considered locally relevant. The network links government offices at three levels – county, township and village – and is capable of moving information and knowledge both to and from farmers (Figure 5).

At the county level the service station relies on agricultural departments for funding, content development and management. A township information service station, such as shown in Figure 3, is set up with the support of the township rural economic management, agricultural and technological extension and cultural service centres. The village information station is established in villages where the production of a specific agricultural product or a group of products has reached a certain scale, and there is strong demand for information. The village “spots”, or mini stations, rely on the village committee and large farmer households of crop farming, animal raising and business operations for staff. As well, specialized farmer associations and dragonhead enterprises\(^4\) of agricultural industrialization and other intermediate organizations and businesses that can provide services to

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\(^4\) A “dragonhead enterprise” refers to a leading enterprise of agricultural industrialization that is supported by development policies. If we call an industry a dragon, the development of the industry itself and the smallholder farmer households are believed to benefit from one or a number of large-scale, economically powerful, competitive and technologically advanced enterprises, or dragonheads, to take the lead.
farmers also contribute to the village spots. All established township and village information service stations have reached the requirements of “five ones” of the Ministry of Agriculture.

Agricultural Technology 110 (Figure 4) is an organization format of information service in rural China, which was started in Quzhou of Zhejiang province. In some areas, the agricultural department, in association with other departments related to agriculture, organized an agricultural information consultation service agency, which uses the police emergency telephone number of 110 as its name to indicate the promptness and convenience of the agricultural information service. In some places, the information service stations are called Agriculture Technology 110, while elsewhere it is simply called Agriculture 110.

Since township and village service stations and spots are widely distributed in rural areas, they resolve the problem of the “last mile of connectivity” of information by providing service to farmers through multiple approaches. This model is used in Jinyun, Wuhu and Shucheng counties. The information flow of the service station model is illustrated in Figure 5. The two-way arrow symbol represents two-way communication.

Key points for replication

(i) The support of the government is critical in every phase of launching the service station model. For example, Jinyun county is part of a poorly developed area in Zhejiang province and is a target for poverty alleviation programmes. Shucheng is an impoverished county. However, local government officials in both areas recognized the importance of agricultural information and the public’s need for access to it and thus gave the establishment of an information service network system top priority.

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5 “Five ones” standard (“six ones”, “seven ones”) means the number of conditions that must be met before a county or township information station can be set up. Document No. 11 of 2002 of the Ministry of Agriculture requires that county information service stations must not be lower than the “five ones” standard, which means that the centre must contain a computer and printer, a designated telephone line, one to two full-time or part-time workers, a human organization network and management and service regulations. Localities also have proposed different standards according to the local conditions, such as a designated room for a computer (a room on the street side to receive farmers) and a bulletin board.
The officials set up a task team to develop the network, issued informational notices to all relevant agencies for inclusion in the organizing and provided financial support. As a result, a three-level service network in the county, township and villages was quickly established.

(ii) Government funding is the foundation of the network. The finance bureaus covered all start-up and continuing overhead costs of the network. To help keep the costs manageable, the Jinyun county government coordinated with the county telecommunications bureau and issued several favourable policies for the development and operation of the network.

(iii) Human resources of related departments should be integrated and consolidated to maximize the advantages of resources. Because the spectrum of production in rural areas is very broad and farmers’ information needs involve crop farming, animal raising, product processing, agriculture, forestry and water conservation, among many others, one department can hardly satisfy the diverse demand. It is necessary to utilize the human resources of all relevant departments in a coordinated manner to provide comprehensive services. For example, the expert consultation group established by the Jinyun county officials included people from the fields of crop farming, animal raising and water conservation. Regulations were formulated to promote standardized and systematic services. Market information, computer and agricultural technologies and knowledge of other fields were organized by the county information centre and other related departments.

Farmers’ home model

The Lanxi agriculture, forestry and water resource bureaus jointly established the “farmers’ home” model of providing information and knowledge (Figure 6). The service facilities are located in
a 450 sq m “store” that is rented within a busy shopping area of the county capital. It includes 11 specific sales counters, one expert consultation desk and one agricultural product exhibition and trade area. Seeds, pesticides, fertilizers and other production materials are sold at the counters (Figure 7). While shopping for their farming needs, farmers can at the same time speak with sales representatives for the correct application methods of their purchases or any other product. Relevant technical materials also are distributed to farmers for free at the counters. When farmers have technical questions or want to know market information about certain agricultural products, they can turn to the consultation desk for assistance.

This type of one-stop open facility integrating agro-technological consultation, agro-technological extension, information service and business operations provides great convenience to farmers. It has become a popular resource for information and is a practical and easily applicable model for many areas in China. Figure 8 presents a diagram illustrating the information service and paths of the farmers’ home model, with the two-way arrow representing two-way communication.

**Key points for replication**

(i) Government backing in the form of policy support and funding is the first needed step in setting up a farmers’ home. Government seed money can get the system started and considering that agriculture materials produce small profit, government support can keep the service going. In Lanxi city, the government continues to provide financial support to the farmers’ home, which opened four years ago. Among other things, it pays the annual rent of US$9,640 for the premises.

(ii) Considerable thought should be given to the location, outside appearance and internal display of services. The service facility should be located in an area with a large number of people passing by and easy transportation access, preferably close to a parking area. Easy access for automobiles is important for the farmers who will be going to the facility to pick up items as well as information. A spacious facility with sufficient light produces a feeling of openness and easy accessibility and thus encourages farmers, or anyone, to come often, find what they need and take their time picking up whatever information they might think is useful. As Figure 9 shows, the Lanxi farmers’ home has a wide glass storefront that lets people in the street clearly see the products displayed. Inside,
the products and counters are well organized, and users can easily spot and find what they need, including experts for consultation.

(iii) As in the service station model, here also the human resources of different fields should be consolidated in the preliminary phase. In Lanxi, the agricultural, forestry and water conservation bureaus formed a joint consultation group to pool their resources and strengths in formulating the farmers' home model to provide better service. At the same time, government regulations covering work ethics and formalities in dealing with clients were set up to guide the conduct of each member of the group so as to ensure the effects of service.
Association model

The “association” approach to information dissemination works well in counties and townships where the production of one or some farm products has reached a certain scale and in villages where there is a major farm production or large farmer households. These situations generate a flow of many people in somewhat close proximity seeking the same types of information. Because of their similar interests, they are more likely to help establish a specialized association on a voluntarily basis that is autonomously managed by them. This type of group centres around one crop or animal, or some other commodity in common. In Fuyu county, for example, farmers organized a paddy rice association and a boer goat association. Unlike the previous two models, the association narrows its service to providing information to its members that is relevant to the common ground. While narrow in focus, it can cover a range of technical, market and policy issues. Some associations also purchase production materials for members and offer marketing services for farm products. The information flow of the association service network is outlined in Figure 12. The two-way arrow symbol represents two-way communication.

Key points for replication

(i) A certain level of specialized production and scale among several farmers is first necessary for this model to be of any use. As well, the farmers need to have a strong desire for establishing a specialized association and for receiving socialized services in market information, technology and product marketing. At the same time, there must be farmer organizers who are enthusiastic to provide services to others, who have experiences in specialized production and marketing and relevant knowledge of science and technology.

(ii) Government policies that support the establishment of an association encourage farmers to take on this effort and help ensure that they are set up in farmers’ best interest and not created for the benefit of large enterprises or so that anyone can take advantage of rural farmers.

(iii) As the association must operate as a business, an understanding of business management is crucial among at least a few of the organizing farmers. The Fuyu County Information Association does not collect membership fees from its farmers, and there is no funding support from the local government. Still, it provides information
services and technical guidance to members for free. It does cover operating expenses through income from selling production materials, such as fertilizer. As the income level of farmers is very low in most of China’s rural areas, many specialized associations of farmers and cooperative organizations do not collect membership fees from farmers. Those that do charge fees keep the amount very insignificant, compared with the cost of providing their services. Only when the association can obtain its own income source can it balance the expenditure of providing services.

2.3 Differences between the three models

✦ Geographic location
Generally, service stations and associations are located in the rural areas close to farmers and are convenient to farmers seeking assistance. The farmers’ home is located in towns at a somewhat long distance from farmers, and it is not often convenient for farmers to run to town when they encounter small problems in production.

✦ Users
The farmers’ home model has the broadest reach to users, which includes local farmers, enterprises and specialized farmer associations as well as producers and agro-business operators outside the area. In other words, the service of the farmers’ home has no geographic limitation. The typical users of the service station model tend to be producers and agro-business operators of agricultural products from the community. The association model differs considerably in that its service is targeted to a very specific group of users in agriculture who produce similar products and who are members of the association. While stressing development and the consolidation of information service resources, the association model puts more emphasis on the improvement of farmers’ organizations and production specialization levels. It also stresses the benefits of one, or a limited, subject matter and having many people focused on the same thing in one group. Agricultural technological workers in townships of Fuyu county have been interested in helping organize farmers in creating specialized production associations so as to provide more direct, prompt and targeted services to farmers.
**Services offered**

The types of information the users seek in both the farmers’ home and the service station models are rather diverse. The service station model usually provides only advisory information services to farmers while the content involves various agricultural production technologies, market details, demand and supply of products and policy information. Some service stations also provide marketing services in seeds, pesticides and fertilizers. At the farmers’ home, farmers can get advisory information on agricultural production and management and purchase agro-production materials as well. The association model content focuses on production technology and market information of a particular group of products the members produce. At the same time, it also organizes centralized procurement of some production materials and marketing of agricultural products.

**Major actors**

The establishment, operation, development, input and management of the service station and farmers’ home models are strongly backed by agricultural administrative departments of local government; associations are autonomously managed and operated by farmers. Consultation groups involving experts from the agriculture, forestry, water conservation and other agriculture-related bureaus with strong technical strength have been established in the service station and farmers’ home to respond to enquiries. Compared with the association model, the service station and farmers’ home involve more human resources and technological and management advantages that can fully tap agricultural technological talents in government at various levels. But as the specialized associations focus only on the study and development of the market of a particular product, and thus have very good knowledge about the market and rather complete information about that particular product, they then have more advantages for market development compared with the other two models.

**Funding**

The service station and farmers’ home models rely more on the support of government funding and hence have advantages in terms of financing. The association model depends more on the economic profits made by selling agricultural production materials to farmers to cover its expenditure.

**Costs**

The establishment and operation of the service station and farmers’ home greatly depend upon the financial support of local government. Since the association is a civil organization voluntarily established by farmers, the operating costs are relatively low. However, it is because of the stable financial support of government that the service station and farmers’ home have the capability to organize large-scale information service activities, such as hiring experts to deliver technical training to farmers, while the capacity of associations in this respect is much weaker.

Looking at the development perspective, the presence of local government in rural information service in the coming several years will become more and more apparent. In another decade, associations, specialized cooperatives and other intermediate organizations will be greater in number as a result of farmers’ increased awareness of the need to be “self-sufficient”. The economic strengths of these entities will become stronger. As a result, information services in rural areas will then be delivered mainly by intermediate organizations, such as the various associations, while government will shift its function to provide policy guidelines, supportive legislation and administrative supervision. As the farmers become more organized into specialized associations, they will be able to catalyze/support their own information services. Direct support from the government in organizational
and funding capacity will no longer be necessary. However, the government will still have a role in setting policy and “supervision”, i.e. making sure there are no problems through a kind of policing.

## 2.4 Similarities between the models

Even though the three service models differ in form, the methods used by each in providing information have many similarities, as discussed in this section.

### 2.4.1 Sources of information content

With its three-level information service network, the service station model has more advantages than the other two models (such as the county information centre updates and the information-collecting tasks carried out by specialized agencies). Essentially the service station model has a larger network that can be directly commanded by government so its reach in terms of gathering information is wider. However, information service organizations at all levels use the following sources for data and information:

- **Newspapers and periodicals** For instance, the Huzhen township information service station in Jinyun county subscribes to 16 newspapers and periodicals, such as the *Farmers' Daily, Tea of China, Floriculture of China and Practical Technologies for Fruit Trees* (Figure 13).

### Table 5: Summary of main features of the three models

<table>
<thead>
<tr>
<th>Feature</th>
<th>Service station model</th>
<th>Farmers' home model</th>
<th>Association model</th>
</tr>
</thead>
<tbody>
<tr>
<td>Geographic location</td>
<td>Located in rural areas close to farms</td>
<td>Located in towns, some distance from farms</td>
<td>Located in rural areas close to farms</td>
</tr>
<tr>
<td>Users</td>
<td>Producers/farmers and agribusiness operators from the local community</td>
<td>Producers/farmers, enterprises, specialized farmer associations, and agribusiness operators locally and outside the immediate area</td>
<td>Members of an association of producers/farmers that produce a particular product</td>
</tr>
<tr>
<td>Services offered</td>
<td>Provide advisory and information services to farmers on agricultural production technologies, markets, supply and demand of products and policy information; some also sell production inputs (e.g., seeds, pesticides and fertilizers)</td>
<td>Provide advisory and information services on agricultural production technologies and also sell production inputs (e.g., seeds, pesticides and fertilizers)</td>
<td>Provide information services on agricultural production technologies and markets; organize centralized procurement of some production inputs and marketing of agricultural produce</td>
</tr>
<tr>
<td>Major actors</td>
<td>Agricultural administrative departments of local government supported by consultation groups of experts with strong technical knowledge</td>
<td>Agricultural administrative departments of local government supported by consultation groups of experts with strong technical knowledge</td>
<td>Autonomously managed and operated by associations for their farmer members</td>
</tr>
<tr>
<td>Funding &amp; costs</td>
<td>Government funded – stable funding base that allows development of strong service</td>
<td>Government funded – stable funding base that allows development of strong service</td>
<td>Funded by profits made from selling agricultural production materials to farmers; relatively low operating costs; weaker service</td>
</tr>
<tr>
<td>Major advantage</td>
<td>Strong human resource base and infrastructure that taps agricultural public domain at various levels</td>
<td>Strong human resource base and infrastructure that taps agricultural public domain at various levels</td>
<td>Good knowledge about the technological aspects of and market for a particular commodity(ies)</td>
</tr>
</tbody>
</table>
• **County information centre updates** The county information centres require each township and village information service station to promptly report on local economic dynamics and technological and market problems encountered by farmers in production and management.

• **Specialized agricultural agencies** The Jinyun County Agricultural Bureau assigned information-gathering tasks to each of its sections and to the specializing stations in grain and oil crops, county special feature products, animal husbandry and veterinary service and plant protection. This task is used as an item for year-end evaluation of the performance of the sections and stations and as basis for awarding bonuses.

• **Price information points in markets** For example, starting from September 1999, the Litong agricultural information centre in Ningxia Hui Autonomous Region selected three large-scale wholesale markets of agricultural products known as the East Suburb, the Xihu and the West markets as fixed information collection points. The wholesale and retail prices of vegetables, meats, fruits and grains in the markets are collected and analysed.

• **Relevant specialized Web sites** Examples include the China Agricultural Information Network, China Forestry Information Network, China Agricultural Product Supply and Demand Information Network, Anhui Province Agricultural Network and Zhejiang Province Agricultural Network. Useful market information or technological information on crop farming and animal husbandry for local agricultural production is downloaded from these Web sites.

• **Formal and informal events** These include training courses, various types of lectures, meetings and study tours.

In addition to the above, the following methods are applied for assessments of farmers’ needs for information:

• **Telephone consultations**

• **Face-to-face enquiries** In situations when a farmer visits the office.

• **Farm household surveys** Information service or agricultural workers at various levels often carry out surveys and studies in townships, villages and farmer households to assess first hand farmers’ needs and market trends. For instance, the Sanyuan Township Information Station in Wuhu county, Anhui province, printed an “agricultural network information service card” for distribution to farmers who can write down their information needs and return the card to the station. The county information centre requires that the township and village information service stations and information service workers collect a certain amount of information about farmers’ information needs each month. Only the service station model possesses the conditions to provide these details. The collected information is appraised, screened, sorted and synthesized by experts before being published or
released. Wuhu county conducts one or two agricultural product analysis sessions each month, which are also made public in each village affairs bulletin and posted in each village activity centre.

2.4.2 Methods of information dissemination and exchange

There are many service methods combining modern with traditional approaches and technology with human inputs to fully tap the comprehensive advantages of different resources. The following describes the different methods of information dissemination utilized in the sites that were studied:

- **Consultation in office (reception desk)** Designated people on duty in service agencies at the county and township information service centres and information service stations or farmers’ homes address the various needs and difficulties of those who come for consultation (Figure 14). Most of the information service agencies are located in convenient areas for easy access by farmers.

- **Telephone hotline** The telephone is the most common communication instrument owned by farmer households. Among the counties and district studied, the lowest ratio of farmer households with a telephone to the total number of households was found in Fuyu county at 20 percent. The highest ratio reached 51 percent in Wuhu county. In townships with better economic conditions, the rate is even higher. For example, it is 80 percent in Longhe township, Shucheng county. Providing information service to farmers through telephone consultation is one service method widely used in many areas. To help farmers in Jinyun county remember the phone number, the last three digits of the hotline numbers for each of the networks service level (county, township and village) are “110” (Figure 15). Some townships even shifted the phone numbers with 110 as the last three digits already installed in farmer households to the township service station. Designated personnel attend the hotline each day. For questions that cannot be answered right away, the worker will take note.
and seek out an expert in the consultation group. The priority is to provide an answer as soon as possible.  

- **Auto-audio service system** Some information service agencies with mature conditions (long established and with funds) have developed an agricultural expert intelligence audio system with digitalized agricultural science and technology information. An automatic audio recording responds to farmers’ enquiries. Both Lanxi city and Fuyu county have set up a telephone audio service system. Farmers call in and press “1” with questions about rice, press “2” for information on the newest fertilizers, etc. and then hear a recorded answer.

- **Agricultural programmes in collaboration with television stations** The popularization rate of the television set in rural areas is relatively high. The rate of farmer households with televisions in the studied areas is more than 80 percent of the total farmer households. Some information service agencies actively cooperate with television stations and have created agricultural programming that can further extend the coverage of information service. The information centre officials in Fuyu county, for example, initiated a special television programme called *Rural Area in Fuyu*. The county information centre supplies the main content for the programme. Within the programme, there are three spots of public service information entitled: “Science and Technology Garden”, “Information Window” and “Roads to Prosperity”. The programme is broadcast once a week and repeats four times during the lunch hour and after dinner when farmers are resting at home.

- **Agricultural information column in newspapers and periodicals** Newspapers and periodicals are the traditional disseminators of information. Some information service agencies work with publishers of newspapers and periodicals to extend their coverage. *Shucheng Newspaper* in Shucheng county is published twice a week and each edition contains a special column for agriculture. The Agricultural Commission provides the content to the publisher, such as information on seeds, law enforcement, technologies, market analysis and prices of agricultural products. The farmers’ home in Lanxi city coordinates with the *Lanxi Daily* to run a column entitled “Wind of the Field”, which is published every Thursday. The column takes up the whole second page of the Daily, which is the economic page. The circulation of the newspaper is 15 000 copies a day.

- **Publications, bulletins and clear cards** issued by information service agencies Information service agencies with sufficient budgets sponsor regularly and irregularly published newspapers, periodicals and newsletters. For instance, the Huizhen Township Information Service Station in Jinyun county publishes a monthly magazine called *Agricultural Information Dissemination* (Figure 16). Irregularly published publications are produced according to agricultural seasons and activities. For instance, the Longhe township in Shucheng county published the *Longhe Agricultural Technology*, containing technical advice on how to manage crop fields during rainy season in mid-December. It talked of clearing drainage ditches to better drain fields, when to apply additional compound fertilizer and how to strengthen control of aphids and weeds with chemicals. Some information service organizations in rural areas produce concise, practical and urgently needed

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6 There are records for each consultation in information service organizations at all levels. The contents of the record include the time of consultation, the name of information seeker, his/her telephone number and the issue; as well, the name of the responder, the time and concrete content of the reply is recorded. This record is to facilitate similar questions in the future.

7 Information service organizations in rural areas produce cards containing, in brief format, updates on technology, policies and other practical information that farmers need to know. The card is distributed to farmers for convenient use. Farmers call it a “clear card” because the information appears clearly.
information in technology and policies in a single sheet for distribution to farmers who call it a “clear card”.

- Pamphlets, blackboards and bulletin boards in rural areas Some information service organizations assemble news pieces (Figures 17-18) regarding agricultural technology and market information that are cut from newspapers or are photocopies of printed material or actual pamphlets. They are placed on clipboards or bulletin boards in a communal location to facilitate farmers’ access. Blackboards and bulletin boards are established in certain areas of townships where people usually gather, such as in front of the government office, in front of agricultural production material shops, at junctions of main roads and other convenient locations (Figure 19). Information service stations publish timely information on markets, technology, crop varieties and policies for the use of farmers. Sometimes it is handwritten on the board or paper (Figures 20-21), or it is printed and displayed. The bulletin boards conveniently display timely news and advice regarding agricultural technological knowledge, such as different farming practices through the change of seasons, what to pay attention to while planting crops, field management, specific advice on raising animals and how to control animal disease epidemics.
• **Broadcasting** Some townships and villages also broadcast meteorological, crop disease and pest forecast information to farmers regularly through the local radio station (broadcasting is over a fixed line system into each home radio in the village that is wired to the station) (Figure 22). Xingfu village in Shucheng county broadcasts to its residents useful information that is collected from the Internet, newspapers and periodicals. This is a cost-effective measure with wide coverage.

• **Electronic screens, computer touch screens and the Internet** Information service organizations, such as in Lanxi city (Figure 23), with rather strong economic resources have purchased electronic screens to publish policy news and agricultural product price information. Some other centres have bought computer touch screens that are connected with the Internet that allow farmers to search for whatever information they need (Figure 24). All the six counties and district surveyed for this report have launched an agricultural information Web site that features the local rural economic dynamics and information of agricultural product demand and supply. These counties and district also use the China Agricultural Information Network, the Provincial Agricultural Information Network and other relevant Web sites to provide demand and supply information of local agricultural products or to download useful information for local agricultural production for free distribution to farmers.

• **Science and technology fairs, training, lectures and on-the-spot demonstrations** Science and technology fairs are information service activities often conducted in many areas and are typically well attended and received by farmers. Usually the County Agricultural Bureau and the agriculture-related bureaus jointly organize such activities. Agricultural science and
technology specialists will visit the townships and villages, taking along printed materials, books and VCDs and set up desks and chairs in front of the township government building or agricultural product market to distribute the materials to farmers (Figure 25). Farmers can mingle with the specialists and discuss questions and technical difficulties with them. Lectures and training on specialized agricultural and information technologies have been organized periodically by information service agencies to both improve the quality of information service workers in townships and villages and provide science and other information to farmers. In synch with agricultural seasons and growth cycles of crops and animals, agricultural technology specialists visit farm fields and provide targeted information, technical advice and training to farmers. Since the overall education level of farmers is not very high, technicians not only need to translate difficult scientific jargon into plain words that are understandable by farmers, but they also need to demonstrate concepts and practices to farmers who can better understand by being shown a demonstration.

2.4.3 Funding support for information services

In China, providing information service to farmers is a public welfare endeavour and thus is completely free of charge. As for the investment for setting up information service organizations and their operating costs, the sources of funding are different at the county, township and village levels and through associations, as the following explains:

✦ Sources of funding for the county information centre

The establishment of a county information centre mainly relies on a constant source of funding allocated by the local government.
Sometimes there is one-time investment given by upper-level departments, and there are supports in different forms by other local bureaus. For example, the total investment for setting up the Jinyun county information service was US$22 400, of which US$12 100 was allocated by the county government and the county agricultural bureau provided the remaining US$10 300. The annual operating cost of US$7 500 is covered by the agricultural bureau’s budget. The Jinyun County Telecommunications Bureau provided support by issuing favourable policies for developing the network. For instance, the information services centre known as Agricultural Technology 110 enjoys free connection to the Internet, while the township information service station pays US$12.08 per month for its Internet service. At the village information service spots, it is also free for 1 500 hours in the first year and then half price in the second year and with a 30 percent discount in the third year. As 2002 was the first year of implementing the policies at the village level, the county agricultural bureau will continue to solicit favourable policies from the telecommunications bureau.

Source of funding support for the township information service station

Funds needed by the majority of township information stations are from government sources, but a number of such stations also rely on self-raised funds. Funding sources for the start-up construction of the township information service station are from county and township government budgets, while in some areas the provincial government renders support. The daily operating costs of most of the township information service stations are completely sourced from township government funds. A small number of township information stations rely on self-raised funds (Figure 26) to cover operating costs, i.e. income from marketing.
production materials or rental charges for leased space in the agricultural technology extension service station premises.

Funds for township information service stations in Wuhu county come from city, county and township budgets, each providing one-third of what is needed. Each township invested US$1,087 initially to purchase equipment. The routine operating costs are shouldered by the township budget. For instance, the township government provides US$6,000 to $7,200 a year for operating the information service in Henggang township. Of that amount, US$1,400 is used for farmer training activities, US$1,700 for materials, US$700 for market studies and consultation fees, US$2,200 for Internet service provision, telephone and maintenance and the remaining US$600 for other costs. Both the Nvbu Township Information Service Station in Lanxi and the Xinjiang Township Information Service Station in Jinyun county are supported by self-raised funds. The Nvbu station occupies a section of the township agricultural technological extension station, which markets seeds, fertilizers and pesticides. The operational costs of the information station are covered with income of the business operations, which is about US$3,020 annually. The Xinjiang information station is also located within the township agricultural technological extension station, and all its costs, including telephone bills and materials distributed to farmers free of charge, are covered by the income from rental charges for leased space.

Sources of funding support for village information stations and service associations

Usually, the establishment and operating costs of village information service spots are covered by self-raised funds; however, the government provides a certain amount of financial support initially. Where most village information service spots are started by farmers, enterprises and specialized farmer associations, procurement of equipment and daily operational costs of providing information service by such stations are usually covered by the farmers (enterprise or association). Some village information spots are located in the village committee building and revenues of the collectives cover its costs. County and township governments provide a certain amount of incentives, though in different forms. For instance, the county government provided US$181 to each village information service spot that opened in Jinyun county, while some township governments also contributed funds. In some cases, the local government might provide certain incentive fund support. In Wuhu county in Anhui province, officials offered a one-time incentive of US$300-$360 to each village information service worker who did a good job in organizing demonstration households of the Yeast Project. There is no earmarked funding for information association support in Fuyu county, and the association does not charge membership fees. Funds for providing service derive mainly from the slim profit of production material sales to farmers. The only equipment available in the association is a telephone. The specialized association in Wuhu county, however, charges membership fees to cover its expenditures. And the county government and county agricultural commission recently conducted an evaluation session to award US$604 to each of the top 12 associations that achieved good results in providing information services. In general, whether the development and operation of the station/spot is supported by government funding or by self-raised funds, a shortage of financial resources is a common problem and hinders the delivery of information service.

Yeast Project in Wuhu county, Anhui province, is a project approach to promote agricultural structure adjustment and farmers’ income growth. A number of farmer households with good skills in production, management and in using science and technology are selected as demonstration households (yeast) to lead others to adjust agricultural structure and to increase production and income through guidance, service and incentives.
3. IMPACT OF RURAL INFORMATION SERVICES

In recent years, governments at various levels of China served as the major actor in actively promoting the establishment of an information service system in rural areas and have achieved significant results. From the survey of the six counties and districts, researchers noted the following key impacts:

✦ Farmers’ perceptions of information services

The human organization and physical network of information service in rural China are being constructed. Local government in many areas have issued policies, adopted measures and invested heavily in human and financial resources in strengthening public awareness and training. They actively have promoted the extension of the network and development of human resources. As a result, the overall information service in rural areas nationwide has greatly improved. Understanding of modern information technology, such as computers and networks, among information service workers at the grassroots level and even farmers has improved. Their capability to collect, process and analyse information has been upgraded. For instance, workers at the village information service spots are all farmers, but they also know how to use computers to look for and download needed information or publish supply information of local agricultural products on the Internet. The ways by which information is delivered to farmers and to other agricultural industry operators are increasing day by day and the speed of information service is becoming faster and faster. Especially in those areas where information service organization networks have been well established, it is even easier for farmers to acquire information. For instance, among the 74 surveyed farmer households in the three counties of Shucheng, Wuhu and Jinyun, more than 80 percent indicated in the questionnaire that they obtain needed information through multiple channels. It is the common view of farmers that the government-provided information service in rural areas is important and practical. “Now we have helpers to assist us in farming,” explained one farmer.

The efforts over the past several years to deliver information service to farmers have helped them to understand the importance of information. They now start to look for information instead of passively receiving it. And with new information, the traditional concepts and rationales have started to change. In the process of production and operations, farmers pay more attention to information on science, technology and markets. More and more farmers seek from information service agencies data on new crop varieties and new technology. Previously, farmers in Wuhu county, for example, tended to passively tolerate problems of a sluggish market. Now farmers actively use the Internet to improve market conditions and provide 95 percent of the supply and demand information of agricultural products. Qingshui village of Qingshui township in Wuhu is a specialized village in seedling production and tree nursery. The village invested over US$2 400 to establish the village information service to provide information to farmers free of charge. A tree-planting farmer then used the service to request, via the Internet, that he badly needed to purchase 500 trees. A few hours later, he received a phone call from the manager of a tree nursery in Jiangsu province who offered a price of US$0.24 lower than the market price, and a deal was made. At the same time, the farmer also found market outlets for his large stock of evergreen bushes. “I never imagined that it could be so quick and so true,” he said happily. “It is all because of the Internet, and I will have bigger tree transactions done over the Internet in the future.”
Nature and scope of rural government services

Providing market information to farmers and enterprises is an important service that government should provide to agricultural producers under market economic conditions. Its current provision represents an important shift of government management and service functions from the previous focus only on agricultural production to providing market information to producers and business operators in rural areas and guiding agricultural producers to make science-based decisions. Information services have played an important role in the transformation of functions and in improving the efficiency of work, management and working styles of the government.

According to the needs of local agricultural development, information service agencies in many areas collect science and technology information from various newspapers, periodicals and the Internet and promptly transmit the information to producers in rural areas through blackboards, bulletin boards, printed materials, on-the-spot demonstrations, trainings and many other methods. The prompt dissemination of agricultural science and technology information has accelerated the transformation of science and technology research results, speeded up the extension and application of advanced and practical agricultural technologies and to some extent helped resolve the problems of disconnection between agricultural technological extension and the practical needs of farmers. This has improved the target accuracy and effectiveness of agricultural technological extension.

The farmers’ home of Lanxi city, for instance, emphasizes the principle of combining material and information services. In addition to providing practical technological information, it also supplies new crop varieties, technology and pesticides suitable to local areas. In the past three years, it has introduced and sold more than 243 new crop varieties and pesticides and 95 100 kg of improved crop seeds, which have significantly helped in diversifying and improving the efficiency of agriculture in Lanxi.

When farmers go to agricultural extension agents with queries on diversified issues and subjects, it is both a pressure and a motivation for the agents. It reinforces the urgency of grassroots science and technological workers to learn modern agricultural science and technology, to master subject matter knowledge and market information and to broaden the coverage of their knowledge. As a result, it improves the quality of service to agriculture.

Development of agriculture and the rural economy

Through various means, the information service network in rural areas has played an important role in providing farming and animal-raising technologies and market information and in bridging production and marketing; it has achieved satisfactory economic and social effects.

Information service organizations in many areas actively use such modern media as the Internet to publish supply and demand information of agricultural products so as to address difficulties in the marketing of agricultural products. For instance, Senshuai Bamboo in Jinyun county is a private enterprise that produces bamboo products, such as bamboo shoes and armchairs. Even though it has a rather strong capacity of production, research and development, it does not have access to outside market information. This has resulted, in the past, in sluggish sales of its products. In 2002, the Agricultural Technology 110 staff published the supply information of the bamboo products on the Internet, which attracted buyers from the United States and other countries, Hong Kong SAR and other areas within China who telephoned in orders. Since then, Senshuai’s revenues have steadily risen. The Agricultural Technology 110 staff at the three levels in Jinyun county publish
market supply and demand information for more than 75 special agricultural products, or about 90 percent of what is produced, on the Internet, which has led to a 20 percent increase in transaction volume since 2002.

In addition to marketing agricultural products through the Internet, information service agencies also collect market trend information of agricultural products through multiple channels and guide farmers to market their products at a proper time, which reduces losses and increases the income of farmers. Before the spring festival in 2002, for example, the Fuyu county information centre downloaded the information that “the price of corn will be in an upward trend after the spring festival” from the China Agricultural Information Network. After consolidation and analysis, the message, which guided farmers to sell their grains accordingly, was broadcasted during the county television station programme called Rural Areas in Fuyu. The price of corn went from US$0.07/kg before the spring festival to US$0.1/kg after the spring festival and farmers benefited from the informed suggestion to wait.

Through a public awareness drive via the Internet, the publicity of local products has been improved, which also has expanded the scale of external investment in local areas, promoted the effective connection between local resources with external funding resources and injected vigour into the development of local economy. Fuyu county in the past three years attracted more than US$28 million investment via the Internet; US$24 million of that came from a single project involving cooperation with a Japanese company to cultivate Chinese wild rye.

Strengthened market information services guide local farmers to produce products that have good market perspectives and high added value, and it also promotes the formation and development of leading agricultural industries. In November 2002, for example, Wuhu county officials learned from the Internet that Shanghai would start to implement a programme known as “Forest in city”. The plan entails that by 2020 the forest coverage of Shanghai will increase from 10.4 percent at present to more than 30 percent and areas for tree planting will cover 2 300 sq km. To achieve this, more than 60 percent of trees will be procured from other provinces. Upon reading this news, Wuhu county officials promptly organized a team to visit Shanghai, and they helped the tree nursery companies and large farmer households engaged in tree nurseries in their county to forge contacts with the Shanghai Municipality Landscaping Company. The county government also made a decision that tree nursery and floriculture should be nurtured in their area as a leading industry for development. It is planned that the acreage of tree and flower nurseries in the county will reach more than 6 700 ha in 2006.
4. CONSTRAINTS

The following main constraints were noted after analysis of information supply and demand in the surveyed areas:

4.1 Demand for information

✦ Farmers’ capacity to use information needs improvement
At present, young rural labourers usually work in enterprises in local areas or work in cities. People engaged in agricultural production are those who are aged and women who have a low educational level. The ratio of farmers with a high school education in Lanxi was rather high, while in the other counties and district about 70 percent of the farmers had less than a middle school education (Table 1). Farmers have poor awareness of what is available and what they need and a poor capacity to accept information and technological services, particularly on issues of recent innovations and improvements in agricultural production. Many farmers talk about production for the sake of production but lack an understanding about the roles of information within the market-based economy, including the need to use/understand market demand, price data, etc. Some even feel helpless. Their capacity to acquire and exchange information is rather low.

✦ Low farm income level limits access to information tools
In general, farmers in China are relatively poor. The average per capita net income of farmers in the country in 2002 was US$299. Among the surveyed areas, the highest per capita average net income was US$459 in Lanxi city while the lowest was US$215 in Shucheng county. However, to buy a computer (PIII) costs around US$360-480, which is about 1.5 times the annual income of a farmer. In addition, it will cost a farmer US$170 per year if he/she uses a telephone line to surf the Internet, calculating at one hour per day. Therefore, compared with the traditional information dissemination media, the cost of obtaining information from the Internet is far too high. Because farmers’ income is somewhat moderate, naturally their investment in communications and information facilities is low. Among several categories of information reception tools, the ratio of farmer households with a television set accounted for 80 percent of the total number of farmer households in all six counties and district. The popularity rate of the telephone is less than 50 percent. Computers are even less prevalent among farmers. Lack of equipment restricts farmers from fully using the existing information service resources.

✦ Low organization level of farmers and small-holder farmers lowers the efficiency of information services
Farmers in the surveyed areas said that it was relatively easier now to acquire information than in the past. However, when the farmers are not organized or benefiting from a collective understanding of the market, which is the more common situation, their production is not focused on something that might be in demand and/or have competitive advantage. With so many small-holders all doing their own (different) thing, there is no focused demand for information. Under such circumstances, information service workers are overwhelmed handling a large number of simple and repeated questions. As a result, the investment in agricultural information service is quite high and the impact of information use is very low. In areas where farmers are not well organized into groups, collectives or specialty production associations, the ripple effects generated by leading enterprises,
large farmer households in crop farming and animal raising and specialized associations becomes less significant than it could be.

4.2 Information supply

♦ Lack of proper human resources in information services in rural areas

Because there is a shortage of talent in agricultural information service, human resource development of rural information services needs to be further strengthened. The first issue are the numbers: the ratio of information service workers to rural labourers, the users of service, is basically one to several thousands. In Litong district, the ratio is 1 to 10 000 – a severe shortage of people to sufficiently meet the information demand. Second, along with the furthering of agricultural product diversification, crop varieties and animal breeds used in rural areas are increasing day by day, while the requirements for agricultural technology are much diversified. On the other hand, the knowledge of the existing agro-technological workers is outdated, making it difficult for them to suit the requirements of new and complex situations. Third, information service workers in rural areas not only need to be familiar with agricultural technology but need to master computer operation and applications of the network, the laws of market economy and be good at collecting, processing and publishing market information. At present, proper human resources are very scarce, especially in townships and villages. Since most of the information service workers at this level are part time, it is very difficult to ensure that they will be dedicated to the job.

♦ Lack of content and a need for improvement in the quality of information available

There is generally a wealth of information available to respond to technological problems and queries and it is easy to provide a reply. This type of information can be obtained directly from newspapers, periodicals, the Internet or from an expert. The shortage of content, however, is reflected in the category of market information. Market issues are rather complex and it is difficult to collect comprehensive and accurate information. Furthermore, the collected information needs to be processed and analysed, which requires higher capabilities for the information service workers. As Zhang Xuejun of Fuyu county, Jilin province, explained, “I want to know the distribution of green beans in China, what is the national total acreage; what are varieties and whether there has been a disaster for green bean production in the country.” It is very difficult for the county information centre to collect detailed information for a particular crop, even green beans. While some analysis exists on the past and present market situations, there is little predicting information for future market trends. It is therefore very difficult to guide farmers in making their production decisions.

In addition to the lack of information content, there also exists the problem of low-quality, outdated, inaccurate or incomplete information. Because farmers lack the ability to discern between “good” and “bad” information due to low education or inexperience, incidence of cheating and losses caused to farmers occurs from time to time. Li Shuhai, a farmer in Longhe township, Anhui province, picked up from reports in science and technology publications and from an agricultural programme of CCTV-7 that raising scorpions can be prosperous. So he invested and learned to raise the spiders. However, he could not sell his product and the dealer of the seed scorpion who promised to purchase Mr Li’s spiders at a high price failed to keep his pledge. Another farmer in Meiling village in the same township also engaged in raising scorpions; he produced successfully a large number of them but he also could not market them, taking a loss of several hundred dollars. Farmers say that the information provided through the service station or reported by the media is often outdated.
Uneven information services capacity at the grassroots level

At present, the development of the information service in rural areas is uneven. The problem of incomplete information service system and inadequate network extension is quite significant in some areas. In the surveys for this report, 68.9 percent of farmers in Litong, 64.7 percent in Lanxi and 39 percent in Fuyu said that it is not easy to get the information they need. During discussions, farmers reported that the established county or city information centres are all located in the city or in the county proper, usually more than 10 km, or farther, away from rural areas. It is not convenient for farmers to go to the town only for a consultation. The use of telephone and computers to resolve problems from a distance is rather limited. Information provided through television, radio, newspapers and periodicals is basically the service category from point to area without accurate targeting and producing unfocused or unspecific effects. Therefore, it is necessary to improve the capacity of the information service organization network and expand coverage. In areas where township and village information service agencies have been established, there is a clear need to further improve service quality.

Lack of funds

It has been reflected in the surveyed areas that the constraints of funds is a significant problem in the development of an information service system. Information service must rely on modern communication means and equipment, but due to the shortage of funds stations are not adequately equipped with advanced facilities. The means of information collection and processing are rather poor and information service remains at a low level. The problem of funding shortage is even more common in the development of township information service stations. For instance, even though Nvbu township in Lanxi city has set up an information service station, it cannot afford to buy a computer and other necessary hardware; it is therefore difficult for the station to collect and publish information. Workers at the stations that have equipment also complained during the research for this report that it is outdated with low operation speed, which affects the efficiency of their work. The current funds available are only sufficient enough to maintain the daily operation; there is no funding for development. Information service station workers in both Fuyu county and Litong district feel great pressure in fund raising, and the heads of the stations have to go out to solicit support. Without future funding secured, it is not an easy job to have the information service system established as it stands at present.
5. KEY ISSUES AND CONCLUSIONS

From the practices and explorations in the surveyed areas, the study group identified seven critical issues for improving the impact of information and communication. These issues were related to policy support, the method of service delivery and the nature of information content. These three factors were key to the relative success of the three models identified.

5.1 Policy support

✦ Access, empowerment and democratization: supportive policies

Through the surveys, the researchers found that the quality of information service does not completely depend on local economic conditions. What is more important is the awareness of the local government about the need for a service and what is involved in providing it. In some areas where the economy is not well developed, the local government understood the importance of an agricultural information service and issued supportive policies and adopted measures to promote the development of a service system. The achievements in Jinyun, Wuhu and Shucheng counties have proven this point. For example, Jinyun county established a task force, chaired by the deputy secretary of the Party Committee of the county and supported by a member of the Standing Committee of the county Party Committee, the director of the information department and a vice governor from the county government while the heads of the finance, agriculture and telecommunications departments served as members. The county government issued a policy for the purpose of establishing the network.9 In order to ensure a low cost operation of the information service, local government should coordinate with departments concerned to issue relevant policies and reduce or exempt fees of communication line rentals by the agricultural system, Internet connection costs of township and village information service organizations and farmers. The media should provide free service for dissemination and publishing of agricultural information. For entities engaged in agricultural information service, subsidies and favourable taxation policies that conform to the WTO policies should be granted.

✦ Information costs, value and financial sustainability: information service costs and public expenditure

Information service aimed at rural areas and farmers is in nature public welfare. Furthermore, the development of an agricultural information system compared with other construction projects is more imperatively needed but the support and funding is relatively quite weak, the coverage is the broadest and the targeted beneficiaries are the greatest in number. Therefore, whether in an economically developed or less developed area, the major actors of agricultural information service system development must necessarily be government at various levels. The functions of generating income by the information service should not be a focus as it may detract from the real objective of providing a necessary service. Some areas in the country attempted to raise revenue by charging for services, but because the income level of farmers in China is low, the approach ended in failure. In addition, in order to avoid further widening of the gap of economic development between the

9 On 25 September 2001, the county Party Committee and government issued Circular No. 149: Notice of further strengthening information service of agricultural technology. On 24 July 2002, the county Party Committee and government issued Circular No. 138: Notice of furthering the development of village level information service stations of Agricultural Technology.
developed and less developed areas that might be brought about by information technology, the central government should tilt more investment to the central and western regions. This would accelerate the speed of information development in the less developed areas in the western region and shorten the “digital divide” between the eastern and western regions of the country.

5.2 Service delivery

✦ **Building on existing systems:** consolidation and comprehensive use of resources of rural information service organizations

The practice of township information service stations relying on the township agro-technological station, agricultural economic management station, agricultural broadcast school and cultural station is a good method. It organically combines information with science and technology, information with culture and information with education. It fully uses and taps the advantages of the existing resources. Sanyuan information service station in Wuhu county, Anhui province, guided townships in establishing four specialized associations of pig, chicken, pigeon and economic trees. It has more than 3,000 varieties of books, periodicals and VCDs available to the township stations as well as its office space and computers. Sharing of resources improves their utilization rate.

✦ **Realistic approaches to technologies to support information and communication:** integration of a range of technologies

Because of the limited or lack of information equipment owned by farmers in rural areas, both the computer network and various traditional technological measures should be fully tapped so that the modern and traditional means of communication can complement each other. Using television, radio, newspaper and periodicals, bulletin boards, CD-ROMs, blackboards and many other ways to disseminate information along with the computer network will expand the coverage of information.

✦ **Strengthening partnerships:** organization of farmers

Due to the fact that agricultural production is small in scale and scattered in operations with a low level of industrialization, the collective power of farmers is rather low at present. It is very difficult for an information service to achieve scale effects, which then causes idleness and waste of information service resources. Therefore, in order to promote “informatization” (a new term referring to the integration of information in society) and realize the integration of information with farmers, we must be good at organizing information and at organizing farmers. Which is to say that at the same time of developing and organizing information service content, we must make an effort to organize the users of information service – the farmers – so as to guide their demand for and consumption of information. This will help make the informatization level in rural areas compatible with the organization level of farmers. The practices of Fuyu county provide a good example: the users of information service are leading agricultural enterprises, specialized associations of farmers, other types of intermediaries and large households of crop farming and animal husbandry. Through them, market, technological, policy and legal information are disseminated to farmers, resolving the problem of the “last mile of connectivity” in agricultural information service. In the process of organizing farmers, policy guidance, technical assistance and appropriate funding support from the government are necessary. There will be difficulties if farmers are relied upon to get things done due to the constraints of their capacity and economic conditions. And, with the guidance and assistance of the government, developing intermediary organizations (association and cooperatives)
in rural areas not only complies with the national policies, but also with the international development trend.

✦ **Building capacity:** strengthening of training and human resource development

Training is needed for both information service workers at various levels and users of the service, such as enterprises and farmers. The quality of information service workers in rural areas generally needs to be upgraded. They not only lack the capability of collection, processing and analysis of market information, but also lack the knowledge of computer networks and applications. Improved skills among the service workers will help farmers acquire accurate, reliable and useful information. Meanwhile, education and training should be delivered to farmers to improve their capacity in using science and technology, to nurture their awareness about the information revolution and to guide them to consume information.

5.3 **Information service content**

✦ **Locally-adapted content and context:** strengthening of content of information services, focusing on products with competitive advantage or value-added

Collection and development of information content and information service activities must be carried out in relation to the development needs of local leading, unique and advantageous agricultural products. Information services are meant to introduce crop varieties, livestock breeds and fish that are suitable to local areas and that have good market prospects and explain their corresponding technology. The information services also enable technical skills training, organization of production, processing and marketing services and development of corresponding service content. To that end, the effectiveness and accuracy of targeting of information service needs to be improved. At the same time, the content of information service should be conducive to the improvement of local agricultural productivity, to the strengthening of the local production advantage and the competitiveness of local farm products. There needs to be a better sorting of good and bad information. It is important that the content be of good quality and appropriate (locally relevant) to improve the local situation (not overly general or unfocused and causing farmers to adapt to things that are not actually appropriate to their situation).

In a specific case, it has been quite common in recent years that some agricultural products were difficult to be marketed. Usually because of the lack of information and communication, the acreage of agricultural products or the scale of animal raising was too big or an over supply caused an imbalance of the structural supply and demand, which then drove down prices or caused sluggish marketing. Increased production does not necessarily mean income growth for farmers; sometimes farmers suffer from losses in bumper harvest years. Therefore, market information analysis and forecasts for agricultural products must be strengthened to guide farmers in making knowledge-based decisions. Chen Xiaomei, Director of the Henggang Township Information Service Station in Wuhu county, Anhui province, is devoted to information service in rural areas. She carefully studies the markets and provides valuable information to farmers, which helps them make decisions in production and ultimately achieve good results. In 2001, she collected information from various channels and found through analysis that cotton that year would encounter severe problems in marketing. She then published the information, asking farmers not to blindly plant cotton. With the tutelage of her information, the acreage of cotton in the township was reduced to 133 ha. In that year the market price of cotton was only US$0.29/kg, which was only half the
price it was in the good years. In 2002, she predicted, again through analysis, that the price of cotton would increase and informed farmers to expand their cotton acreage. The total acreage of cotton in the township reached 533 ha. The price of cotton in 2002 reached US$0.58/kg. This information-guided adjustment of acreage in cotton helped farmers control losses and increase income.