

# The Channels and Demands Analysis for Chinese Farmers' Agricultural Information Acquisition

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## Abstract

This paper studies the characteristics of information sources and farmers' demand for agricultural information in the process of agricultural informationization in China. We point out that it is not common for farmers to adopt modern information technology communication tools in rural areas nowadays, and the reason for this phenomenon is that farmers still rely mainly on traditional channels for information dissemination. To change the status quo, our government should respect farmers as dominant statuses in the process of agricultural informationization and encourage households with large-scale agricultural operation to use modern IT products in order to spread agricultural information in rural areas.

**Index Terms:** Information technology; channels for agricultural information; agricultural informationization

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## 1. Introduction

With the development of internationalization and regional economic, China's traditional agriculture is still inefficient and facing increasingly fierce competition in the international market. The only way to change this situation is to rely on modern science and technology, especially IT. All these kinds of technology can substantially improve agriculture efficiency. Agricultural informationization is a social and economic pattern and has positive effect on agricultural production and rural development. Shan's research pointed out that China's agriculture had not yet fully achieved the task of industrialization [1]. In view of the special stage of agriculture economic development, China inevitably encounters problems that other countries do not in the process of informationization. Determined by the leap-forward development style, Chinese farmers need to use IT as soon as possible in agricultural reform. So it is necessary to do research on the characteristics of information sources and demand for farmers in different income level groups.

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## **2. Analysis for the Status of China's Agricultural It Infrastructure Construction**

Aim of achieving agricultural informationization, the government has implemented the "Every Village Telephone Connection Open Project", "Golden Agricultural Project", "EIC Integration Project", "Demonstration Base of Rural Information Construction Project", "Rural Business Information Service Project", "Cultural Information Sharing Project", "Modern Distance Education to Party Members in Rural Areas Project", etc. These projects have got remarkable results in information service infrastructure construction, institutional teams and information resources development in rural areas. However, some studies show that the government has paid too much attention to "hardware" investment and neglected the development of information service. Because farmers cannot meet necessary demand for information service, they give up using information infrastructure. Widespread use of information equipment is the prerequisite of achieving informationization.

In recent years, telecommunications in China develops very fast. China's network construction scale and the total number of internet users rank first in the world now. But in rural areas, telecommunication development is very uneven and sometimes standstill. Data from the "2nd National Agricultural Census Main Data Bulletin (2008, made by National Bureau of Statistics)" showed that 97.6% villages all over the country had opened telephone connection; every hundred rural residents on average had 51.9 fixed phones and 69.8 mobile phones as of end of 2006 [2]. The China Internet Network Information Center released the "2009 Survey of Rural Development of the Internet Report" and said the number of Chinese rural internet uses reached 10,681 as of December 2009 [3]. The average online time of users from rural areas was about 16 hours/week and average weekly online time increased by almost 3 hours compared with 2008. This means internet in rural areas has taken an important place in everyday life.

Significant achievements in telecommunications infrastructure construction and large number of investment from our government are inseparable. But we know that whether agriculture will improve soon is another matter. The survey of the Ministry of Agriculture about the case of agricultural information using by households from 1,000 rural fixed observation points showed that only 0.8% rural households got market and technology information via internet; less than 0.2% often bought means of production with online shopping; and less than 0.5 sold production by e-commerce. Chu made a report several years before [4]. Puyan town in Zhejiang Province and Tianqiao County in Anhui Province did a survey on consumption of fixed number together in 2002. Both villages were at forefront in economic development, and on average each household's monthly net income was ¥2,000 and ¥1,300 separately. We preliminary estimate the results of consolidated questionnaire and interviews and find that rural residents investigated in Zhejiang Province charged ¥40 per month on phone, whose expense was equivalent to 2% of their monthly net income. And Zhang and Yu said in Anhui Province farmers expended 3.46% of their net income a month on phone [5]. We can conclude that the household's expenditure on telephone compared with household's net income is still relatively small, and farmers use phone infrequently in agricultural production. In many rich rural counties this kind of phenomenon is also very common. Overall, the consumption of communication infrastructure in China's rural areas is not enough.

It is said that there is a profound contradiction existing in the process of China's agricultural informationization. One side is the government's surplus investment for telecommunication infrastructure, and the other side is the inefficient use of these resources. To enable farmers enjoying the true convenience brought by IT, the government should sort out the root causes of conflict. And one purpose of this paper is to figure out the problem.

In this essay we review the process of agricultural informationization in China first. And then we discuss the characteristics of information demand for farmers and their regularly used information sources. Finally, in view of the special nature of agricultural production and management, we give some corresponding suggestions.

### **3. The Channels and Demands for Farmers' Agricultural Information Acquisition**

A research reported that the most important three kinds of information in agricultural production are practical technology, government agricultural policy and market information [6]. Other information needed include weather, education and training, new products, legal, recruitment and entertainment information. This paper mainly discusses market information obtaining and releasing for farmers. Characteristics of agricultural and industrial structure are not the same in different areas. So regularly used information sources are also different. However, these sources can be divided into five categories as following: (1) primary public service organizations, such as government, research institutions; (2) for-profit organizations, such as agricultural enterprises, agricultural sales departments, agricultural wholesale markets; (3) agricultural organizations, such as professional organizations, cooperatives; (4) individuals, such as neighbors, friends and family members, science and technology demonstration households; (5) information technology media, such as computers. Actually farmers with different scale of operation obtain government agricultural policy, practical technology and market information from different channels. This essay discusses the three types of agricultural information separately, and focuses on the channels and demands for farmers' information acquisition.

#### *3.1. The channels and demands for government agricultural policy*

We dealt with data from Tan's survey using a comparative analysis of hierarchical classification based questionnaire and found that channels for agricultural policy information mainly were television, newspapers, radio, village government, friends and neighbors [6]. In accordance with the order of importance among channels of positive effects, popular channels usually contain organization communication channel, electronic media and paper media.

Since government policy information transfer is handed from central government to local residents, in order to timely inform residents, governments at all levels tend to choose traditional information transmission means. And farmers obtain policy information in a passive state which brings large difficult in taking full use of IT information channels.

#### *3.2. The channels and demands for practical technique*

Lei Zhang et al did a questionnaire survey to get data about farmers' demands for several kinds of practical technology from 13 provinces including 411 cities and 973 villages in 2009 [7]. Zhang's research pointed out that pest control technique, plant breeding technique, cultivation and fertilizer technique are the most useful three types of agricultural practical technology. All these techniques are conventionally belong to production-oriented technology.

We did a similar survey and drew a conclusion that 20% farmers used to learn planting technology by individuals as well as relatives and friends. That is to mean farmers rely on their own exploration and experience. But currently more and more farmers tend to obtain information from agricultural sales markets, and they take 14% of total rural residents. Other farmers who regularly use video recording also take 14%. We should pay much attention to the reality that the proportion of farmers who often use internet to study techniques is far less than 10%.

In these years agricultural information websites found by the government, research institutes and various organizations have developed rapidly. A large number of inputs have been invested into the foundation of all those agricultural knowledge websites. However, in accordance with findings above, many resources have been wasted actually, and those being used by farmers regularly may be just one very small part.

We also found that agricultural operation scale had an impact on choosing information scale for households. This can be illustrated more clearly in Table I (see appendix). Significant difference can be seen

between farmers with large scale operations and ordinary farmers. When the operation scale of a household grows larger, it tends to call for new messages from authoritative organizations and IT infrastructure.

### *3.3. The channels and demands for market information*

Agricultural market information mainly refers to the current sales price, the supply of agricultural products, the future supply and demand and economic forecasts. Demands for farmers' agricultural market information acquisition usually reflect scale of farmers' operation and their income level. In general, households with larger scale of operation need more information from the market. In this section, we first analyze households' demands and channels for market information. And then we explore factors which influence farmers' market information acquisition at a certain scale of operation and income level.

According to the definition of information theory, information is a form of economic resources. Nowadays only participants may get benefits by using information frequently and normally. Information also incurs cost, since in the process of information production all steps like gathering, treating, storage and transfer are required to be paid. When the information searching cost is too high, farmers may inevitably reduce their demands for new information. We distinct households by different annual income level, and find operation scale and income level do affect households' using frequency of IT.

Wei made a study focused on Tianjin through questionnaires, field visits and other forms of investigation on the information demands of households with large scale operations [8]. Households with large agricultural operations refer to farmers whose cultivation, production, breeding size and general household goods are much higher than other farmers. Wei did the survey mainly among farmers who plant vegetable or breed poultry and livestock. The results showed that farmers with both production and operation of planting or breeding have shown very high desire for variety kinds of information from the market. Table II explains several channels that households with large operation used to obtain relevant information (see appendix).

From table II we know that households with large operations often use four kinds of channels to obtain products' price news including wholesale markets and bazaars, televisions, radios, brokers, neighbors, relatives and friends. The top three channels for price of means of production information acquisition are brokers, neighbors, relatives and friends and television. The reason is that farmers with large operation scale tend to choose more authoritative sources of information to ensure the reality and quality of the news.

Based on the statement above we may conclude that Chinese farmers mainly use traditional channels for government agricultural policy, practical techniques and market information acquisition, and their behavior is affected a lot by experience of individuals, relatives and neighbors. It also explains why in rural areas all households in one village often plant same kinds of cash crops or breed similar types of poultry or livestock. Because in a village households with large operations usually begin to operate a certain production operation firstly. With the increasing of their operation scale, their success may gradually influence farmers surrounding and make them imitate the same operation later. We believe that households with large operations in rural areas have natural advantage to diffuse information in a region, and this can be illustrated by the following reasons.

First, generally farmers with large-scale operations concern about agricultural market information, and their demand for new messages is even more urgent. Since other farmers with small-scale operations only cultivate agricultural products for their own consumption, even if they understand supply and demand in market they have no excess product to sell. Xiao and Tao also hold this opinion [9]. Thus market information brings less benefit to farmers with small-scale operations than households with significant scale.

Second, large farming households usually have higher economic efficiency and can automatically get more information. For example, in a market the largest distributors of agricultural products may get more orders and find the price fluctuation earlier than other sellers. When they change their strategies, other participants in the same market follow them. So the behavior of the largest distributors can be seen as a benchmark.

Third, households with long-term operation may form fixed ways for information acquisition, and their ability of identification is often reliable. Usually information treated by them is also convincing.

All in all, large farming households can be seen as an important channel for dissemination of agricultural information in rural areas. They have natural advantage to get more useful information and also can easily influence surrounding farmers.

#### **4. Conclusion**

In this paper, we analyze the channels for farmers' government agricultural policy information, technology information and market demand information acquisition, and find government's investment in communication infrastructure doesn't achieve desired objects. We conclude that farmers in the process of agricultural informationization still prefer traditional channels for information and seldom use modern IT channels to actively search new messages. There are two main reasons for these problems. First, in rural areas most of the households are poor and they can not afford modern IT products. Because the cost of IT inputs is still too high recently. The great expense limits the use of communication facilities by low-income households. Second, China's agricultural industrialization has not been completed. Most farmers own small-scale operation that have lackluster demand for news and have no motivation to search more information themselves. To further promote the process of agricultural informationization in China, the government should provide farming households with large agricultural operations with subsidy in order to encourage them use IT infrastructure effectively and regularly. This may be an effective way to address problems above.

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Table 1 Different agricultural operation scale and technology information channels for households

| Channels for agricultural technology information | Plant breeding technique |               |              | Pest control technique |               |              | Cultivation & fertilization |               |              |
|--|--------------------------|---------------|--------------|------------------------|---------------|--------------|-----------------------------|---------------|--------------|
|  | <i>Small</i>             | <i>Medium</i> | <i>Large</i> | <i>Small</i>           | <i>Medium</i> | <i>Large</i> | <i>Small</i>                | <i>Medium</i> | <i>Large</i> |
| By individual                                    | 54.01                    | 53.19         | 60.9         | 44.81                  | 43.6          | 46.85        | 23.75                       | 21.79         | 22.24        |
| By relatives and friends                         | 28.02                    | 30.98         | 34.13        | 20.99                  | 22.83         | 23.19        | 12.79                       | 13.87         | 13.23        |
| By video recording                               | 12.06                    | 12.86         | 11.64        | 14.16                  | 18.95         | 15.93        | 9.02                        | 10.18         | 7.55         |
| By internet                                      | 1.34                     | 1.19          | 0.96         | 1.2                    | 1.31          | 0.63         | 1.81                        | 1.96          | 1.08         |
| By sales market                                  | 17.86                    | 22.99         | 19.39        | 21.39                  | 26.88         | 25.57        | 6.39                        | 6.86          | 5.21         |

In this table: Small means small-scale; Medium means medium-sized; Large means large-scale.

Table 2 The Channels for households with large operations used to obtain information

| Agricultural price information | TV   | Radio | Agricultural broker | Newspaper | Agricultural organization | Neighbor, relative and friend | Meeting | Government | Wholesale market |
|--------------------------------|------|-------|---------------------|-----------|---------------------------|-------------------------------|---------|------------|------------------|
| For products                   | 34.4 | 9.2   | 30.9                | 4.3       | 2.1                       | 29.4                          | 12.1    | 7.8        | 39               |
| For means of production        | 23.4 | 16.3  | 33.3                | 12.1      | 2.8                       | 27.3                          | 5       | 13.5       | -                |

In this table: The data means the number of selected households in a channel share percentage of the total number of surveyed households (%), [6], some data is changed.