



China Agricultural Extension: History, Current Status and Supply-Demand Characteristics

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Extension has been playing an important role in agriculture development for a long time. It has disseminated many kinds of agricultural technologies and thus greatly accelerates agricultural growth and rural development. Along with changes in government policies, demand and supply characteristics of technology, and marketing reforms, agricultural extension system is at a crossroad, facing more opportunities together with challenges.

Six generations of China's agricultural extension system

Establishment of local extension system (1949–1957)

In the 1950s, many policies are made to increase agricultural production, and expand agricultural extension services. In 1952, according to the communist party of China CPC's <Decision about Mutual Aid and Cooperation in Agricultural Production>, ministry of agriculture proposed to establish a technology extension network which centers on farm, which is based on mutual aid group and relies on technicians. In 1953, ministry of agriculture released the Plan on Agricultural Extension and Suggestions on Expanding Agricultural Institutes and Intensifying Technology Support. These two documents require building extension station at the district level. In 1954, Regulations for Agricultural Technology Extension Station are made to define the task, management, rules, funding, equipment, etc. of extension stations. Agricultural extension stations are more common. In 1957, local agricultural extension stations, animal husbandry and veterinary workstations and Fishery Technology Extension Stations are built nationwide (Zhang etc., 2008). In this period, agricultural extension system is preliminarily built, and is incomplete with no higher-level management organization.

Retgression and adjustment (1958 - 1965)

1959 to 1961 is known as the Great Chinese Famine, and agricultural extension organizations are greatly reduced due to economic difficulty and people's commune system. At the end of 1959, one-third of the extension stations are closed and extension personnel are reduced by two-thirds. After 1962, national economy recovered gradually and the extension system were also rebuilt and transformed from general to specialized stations. In December 1962, Suggestions on Expanding Agricultural Extension Stations and Intensifying Technology Extension Service is released by the ministry of agriculture. This document outlines the general development strategy for agricultural extension. There are 14,460 agricultural extension stations and 76,560 technicians by 1965. Extension stations gradually have specialized sectors: technology, seeds, fertilizers, machineries and livestock sector, etc..

Transformation from supply-centered to demand-centered extension system (1966–1977)

Since the beginning of the Cultural Revolution in 1966, most of the extension organizations had been closed and technicians were forced to change their job. Extension work stagnated. Although there was no working technology extension organizations, demand still existed. Some districts formed their own technology experimental stations. Huarong County of Hunan province created “Four-Level Agricultural Technology Extension System” in 1969 and the four levels are county, commune, production brigade and production team levels. In 1974, the ministry of agriculture and forestry along with the Chinese Academy of Science held a meeting about this particular extension paradigm, and required that “Four-level Agricultural Technology Extension System” should be applied to most areas in three years. From 1976, the Ministry of Finance allocates 20 million RMB to support agricultural technology organizations each year.

Recovery and development (1978-1989)

The universal application of agricultural household responsibility system since 1978 requires the reform of agricultural extension system. The main tasks of this period include: to build county-level agricultural technology extension center and make it the main force; to reform the operation modes of related organizations and to promote diverse types of agricultural technology service entities, then gradually reduce the reliance on public finance; to intensify the local extension work. By the end of 1989, there are 203,000 extension organizations, 868,000 extension technicians (of which 403,000 are civil servants and 465,000 are farmers), about 10,000 special technique associations, 1,000 farmers' technology service organizations. All these constitute agricultural technology service system. From 1984 to 1986, 15,947 new technologies are disseminated and this covers 1.66 billion Chinese mu (1mu=666m²) and increases economic benefit by 16.36 billion RMB. 74,000 training seminars are held and 1.27 million people benefit from it. (Kong, 2009)

In-depth reform (1990-1999)

Along with economic marketing, agriculture and rural economy has entered a new era: the

shortage of high-quality agriculture products. The main tasks of this period include: to continue stabilizing local extension personnel; to further reform extension organizations and encourage the development of diverse service systems. By 1996, there are 1,880 county-level extension centers and by the end of 1999, there are 212,000 extension organizations, of which 19,700 are at county-level, 183,000 are at village and town-level. There are 1.25 million personnel in total and 912,000 permanent staff. Agricultural extension system has made big contributions in promoting new technologies and varieties thus accelerating agricultural development. (Kong, 2009) However, problems such as low professional skills, bad management, etc. still exist.

New reform (2000 to present)

Since the new century, government policy regarding agricultural extension system reform has changed a lot. While introducing market incentives, the public services' non-profit nature is stressed. The main strategy is to transform village and town-level extension organizations into entities combining extension service and production. The main task is to distinguish between public and private services, to build new extension system and to promote the development of agricultural technology system. The main reform content include: to intensify public functions and extend private services; to regulate and accelerate the development of extension organizations; to promote technology demonstration. Despite of many difficulties, such as fierce market competition, shortage of funding, less management authority etc. and thus reduced organizations and personnel (Sun, 2008; Zhang etc., 2009; Huang, 2009), agricultural extension system has made important progress in this period. By the end of 2009, 1626 counties (cities or districts) have completed local extension system reform, accounting for 61.0% of the total. There are 1.096 million local non-profit extension organizations and 82.5% are funded by government. There are 7.14 million local technicians, 49.7% of whom have a degree of junior college or above, 67.9% of which have professional titles and most of which have steady paychecks (ministry of agriculture, 2011). A new local extension system is preliminarily built and has the following characteristics: led by national agricultural technology extension organization, based on rural cooperatives and involving research institutes and agricultural enterprises. Meanwhile, lots of agricultural technology related projects are carried out and have made significant contribution to agricultural modernization.

Current status of Chinese agricultural extension system

After the application of market mechanism, the trend of diverse entities is becoming clearer. Nongovernment extension organizations are becoming more and more important. This paper describes the current status by extension entities:

Government agricultural extension organizations^①

Organization: By the end of 2009, there were 1.096 million local agricultural technology

^① Source: Ministry of Agriculture. 2011. 2010 China Agricultural Technology Extension Development Report. China Agricultural Press

extension organizations nationwide, of which 22,000 were at the county-level, accounting for 20.07%, 6,100 are at district-level, accounting for 5.57%; 81,500 were at the village and town-levels, accounting for 74.36%.

Personnel: By the end of 2009, there were 7.134 million local agricultural technicians, of which 2.87 are at county-level, 35,100 are at district-level, 3.913 million are at village and town-level. 49.7% of the personnel have a junior college diploma or above and 67.9% have professional titles.

Equipment and funding: 82.5% of the local extension organizations are fully funded by government and have sufficient equipment and stable funding. Survey on local agricultural technology extension organizations conducted by the ministry of agriculture in June 2010 shows that 55,626 organizations' are mainly funded by government (80% of the funding are provided by government).

Nongovernment agricultural technology service organization

Leading enterprise: Leading enterprises can help connect small households and “big markets” through its technology platform and social network. The main cooperation paradigms are as follows: (1) enterprise + farmer: leading enterprise provides farmers with input, capital and technology and farmers produce according to the requirements of enterprises. Enterprise will buy final product at a price set by contract. (2) Enterprise + cooperative / association + farmers: most the services are provided by cooperatives or associations. As cooperatives and associations are organizations of the farmers themselves, this paradigm is better for new technology adoption and information utilization. (3) Enterprise + village committee + farmers: village committee works as intermediary agent and this will decrease transaction cost and reduce information asymmetry.

Cooperatives: Farmers' cooperatives are now playing an important role in the application and dissemination of new technology. Cooperatives collaborate with research institutes and extension organizations, and provide services to their members. Nowadays, over 95% of cooperatives provide effective technology services and help solve the Last Mile problem. For example, the Shandong Wucheng Farmer's Technology Information Service Association provides its members with seeds, pesticides and fertilizers through group buying and direct purchase and this will reduce the price by 10%; Shanxi Fuping Zhoujiapo Apple Association is established in 2002 and has 1600 members and covers over 2,000 Chinese mu fruit ranch. The association provides almost all kinds of technology services needed.

Village committees: The major paradigm is: village committee + cooperative + farmer. Specifically, village committee is the leader of cooperative, such as in Zhongmen Village of Tonglu County, Zhejiang province, village committee utilizes its resource and network to provide office and service site and provides a series of services.

Technology service demand and provider analysis

This paper analyzes farmers' technology service demand and service providers using the survey data of Shandong, Shanxi and Ningxia provinces provided by school of agricultural economics and rural development of Renmin University of China.

Farmers' technology service demand analysis

The primary demand characteristics for all stages of production are displayed in table 1.

Table 1. Agricultural technology demand analysis

Technology	Demand status			Technology	Demand status		
	No Need	Indifferent	Need		No Need	Indifferent	Need
Technology information	50	20	262	tractor-ploughing	195	4	128
Seed selection	70	9	253	machine repair	261	1	66
Fertilizer selection	53	9	268	harvest	238	2	89
machine selection	190	8	132	threshing	247	2	79
machine rent	220	7	103	pick	242	3	84
pesticide selection	69	11	250	packaging	293	1	35
sowing	196	13	122	storage	297	2	30
fertilization	214	14	103	transport	273	5	50
insecticide spray	213	12	105	sale	89	5	233
irrigation	73	10	245	process	298	3	25

Resource: Survey data by School of agricultural economics and rural development of Renmin University of China

Technology service provider analysis

Along with the development of market economy and the improvement of new agricultural service system, there are more and more types of agricultural technology service providers. Besides government organizations, village committees, cooperatives, leading enterprises, research institutes and input suppliers start to provide some specific technology services. All those constitute agricultural technology service system. Technology service provider information is shown in table 2.

Table 2. Technology provider information

Technology	Provider						
	Government	Village	Cooperative	Enterprise	Research Institutes	Input Supplier	Others
Technology Information	54	30	11	6	9	6	25
Seed selection	24	15	5	9	1	120	23
Fertilizer selection	0	4	4	4	1	174	22
machine selection	5	1	3	1	1	48	31

machine rent	1	6	1	1	0	8	55
pesticide	0	2	4	2	2	166	24
selection							
sowing	3	2	2	1	0	3	52
fertilization	5	0	4	0	1	2	24
insecticide	3	0	4	0	0	2	25
spray							
irrigation	17	79	4	0	0	0	82
tractor-ploughing	1	9	2	1	0	0	83
machine repair	1	0	0	0	0	1	40
harvest	0	2	0	0	0	0	63
threshing	0	3	2	0	0	0	44
pick	0	0	0	0	0	0	52
packaging	0	0	2	1	0	0	10
storage	0	0	2	0	0	0	9
transport	0	1	2	2	0	1	36
sale	2	0	4	20	0	14	159
process	0	0	0	1	0	0	4

Source: same as table 1.

The above two tables indicates that:

- There are many types of providers. Each type of provider covers small amount of farmers and specific type of services. Post-production service is not enough and agriculture product selling is still a problem;
- Overall, government organization is the leading provider. There is still room for cooperative, enterprises and research institutes. Individuals play an important role in technology service supply.

Analysis on effective supplier

Table 2 indicates that there are three major technology service suppliers: public agricultural technology extension organizations, leading enterprises and farmers' cooperatives. Public extension organizations mainly include county-level and village and town-level extension stations.

Along with higher marketing level and more part-time farmers, the demand for agricultural technology are becoming more diverse. Therefore, more kinds of technology service providers are needed. Field survey shows that household receives technology information and service from many providers. Some specialized farmers have connection with many extension organizations, like government extension organizations, leading enterprises, cooperatives, research institutes, etc. Also, all kinds of providers have closer connections among them.

Conclusion

Diverse technology service demand requires diverse service providers. To meet the diversity trend, an extension system combining public service and market behavior should replace simplex government-led extension system. Comprehensive agricultural technology extension system will continue to facilitate agricultural economic growth.

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