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ARTICLE

Agriculture Insurance in China: History, Experience, and Lessons Learned

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Abstract The development of agriculture and the rural economy play a crucial role in China's socioeconomic system. Agriculture insurance has become key in ensuring the growth of agriculture and stabilizing farmers' income when faced with natural disasters. The focus of this article is the history of the development of Chinese agriculture insurance since the 1980s and the trial of a new agriculture insurance launched in 2007, the policy details implemented in selected provinces, and the operation models. Using results from an investigation and field survey conducted since 2007 in Hunan Province, this article analyzes the performance and effects of this agriculture insurance trial run from the perspectives of different participating stakeholders, and with an emphasis on the program's four principles. The experience and lessons learned are summarized, followed by recommendations on how to ensure the smooth operation and sustainable development of this new agriculture insurance program.

Keywords agriculture insurance, agriculture insurance policy, agriculture insurance trial, China, Hunan Province, natural disasters

1 Introduction

China is among the few countries in the world at risk for a large variety of highly destructive natural disasters. Every year, China experiences economic losses of up to RMB a few hundred billion Yuan from natural disasters, and the portion of the losses that the agricultural sector shares is significant. Given the fact that China has a rural population of 900 million, agriculture is the basic key to ensuring sustainability of the national economy. One of the promising means to ensure growth of the agricultural economy and the stability of rural society when faced with natural disasters is to establish an agriculture insurance system.

We believe that the effective support of government plays a critical role in the development of an agriculture insurance system. Direct government subsidies to agriculture insurance programs are now a popular policy instrument in countries where government initiatives are carried out to manage disaster risk in the agricultural sector. In the United States, for example, government support to agricultural producers in the form of premium subsidies started in1980, with legal amendments over time (Gardner and Kramer 1986; Glauber 2004; Barnett 2007). According to a systematic review of agricultural insurance practice around the world by Ibarra and Skees (2007), the subsidies are organized in a form of bilateral system: the government subsidizes the premiums, that is, pays a percentage of the total premium, and the administrative costs of the insurance companies are absorbed by government funds. These direct subsidies are aimed at establishing a viable agriculture disaster insurance market, although some researchers have raised concerns about the design of the subsidy approaches and their impact on economic efficiency and equity (Skees 1999; Goodwin 2001).

This article first outlines the history of agriculture insurance in China, and uses the profiles of two major insurers between the 1980s and 2006 to describe the performance of agriculture insurance before the new trial run launched in 2007. We then review the new trial of agriculture insurance, the mechanisms of government support, policy details (coverage, premium rates, subsidies, and so on), models of operation, and management of the disaster fund. Survey data from Hunan Province show the performance of the new trial run and summarize the feedback and concerns of various stakeholders. An example of good operating practice is demonstrated, followed by a discussion of the four main principles of this policy-oriented trial program and recommendations on how to improve the operation and sustainability of the current development of agriculture insurance in China.

2 The History of Agriculture Insurance in China

When the People's Insurance Company of China (PICC) was founded in 1949, agriculture insurance was one of the first

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insurance products to be approved in China. China's trials with agriculture insurance began in 1950 with livestock and cotton insurance, but it was only available in selected counties and districts. Eight years later the People's Commune system was established and this early pilot program was abandoned, although the positive contribution of this particular insurance mechanism to the agricultural economy was recognized by the central government at the time.

In 1982, China began a second trial with agriculture insurance. This was based on a State Council report submitted by the People's Bank of China (1982), *Opinion and Suggestion on the Recovery Situation of Domestic Insurance Business and Future Development*, which suggested the gradual introduction of rural property and livestock insurance, among others. The People's Insurance Company of China operated the pilot program, and it got off to a positive start. The receipt of annual premiums increased steadily from 1982 to 1992, with a sharp increase from 1990 to 1993—the receipt of premiums peaked in 1993, reaching over RMB 829 million Yuan. This high level of revenue coincided with the rapid and steady development of the agricultural economy—during the same period GPD experienced an annual increase of more than 11 percent for Chinese agriculture, and farmers realized an annual increase of more than 9 percent in their net income. By 1993, the range of agriculture insurance products was extensive and available in most villages and towns in 29 provinces among the total 34 provinces in China (including autonomous regions and provincial level municipalities). During these 12 years, the average annual insured loss ratio was 105 percent, with a maximum of 136 percent and a minimum of 72 percent.

However, the profile of this trial changed completely after 1993, as shown in Figure 1. The annual collected premiums dropped sharply in 1994 and 1995, and experienced further significant fluctuations from 1996 to 2001. Two key factors affected the performance of the trial in agriculture insurance.

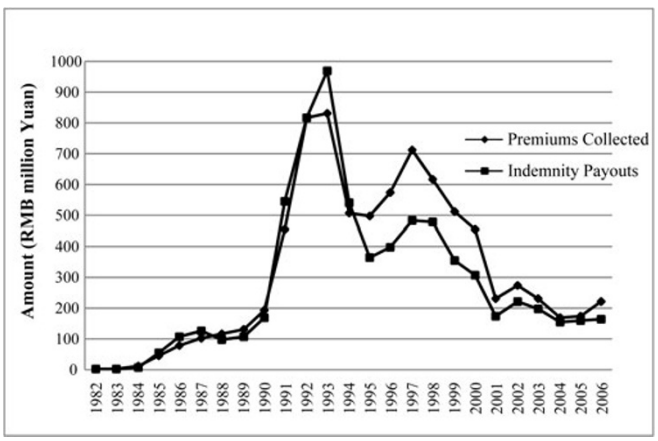

Figure 1. Profile of agriculture insurance for the People's Insurance Company of China (PICC) from 1982 to 2006
Source: Editorial Committee of Yearbooks of China's Insurance 2002–2010; Editorial Committee of Yearbooks of China's Economy 1991–2001; Guo et al. 2007.

First, starting in 1994, PICC changed from a state-owned insurance company with strong policy-related functions to a commercial insurance company competing in the market-driven economy system. Thus, the market for agriculture insurance began to shrink because of its high loss ratio from the previous 12 years. Second, the annual increases in agriculture GDP and farmers' income fell to less than 5 percent in the 1997–2003 period. The insignificant growth experienced by the agricultural economy also affected the further development of agriculture insurance.

The Production and Construction Corps of Xinjiang founded the Agriculture Insurance Company of Xinjiang Corps (now the China United Property Insurance Company) in 1986—it was positioned as an agriculture insurance company to provide products solely in the Xinjiang Uyghur Autonomous Region. Figure 2 shows the annual premiums collected and indemnities paid from 1987 to 2006. The average loss ratio was 72 percent, with a maximum of 110 percent and a minimum of 56 percent. The company promoted the principle of a "low premium rate coupled with a moderate insured amount" to achieve a high take-up rate, which proved to be effective in practice. In 2002, China United Property Insurance Company (China United) was given approval and authorization to enter into nationwide business transactions and its insurance products range was expanded to include all property types.

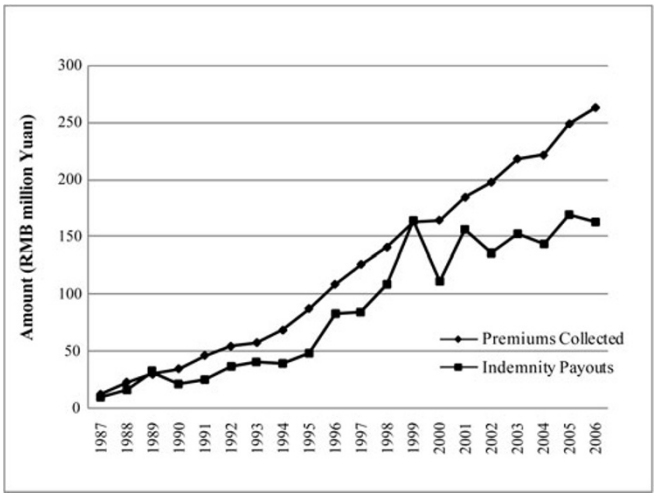

Figure 2. Profile of agriculture insurance for the China United Property Insurance Company (China United) from 1987 to 2006
Source: Editorial Committee of Yearbooks of China's Insurance 2002–2010; Editorial Committee of Yearbooks of China's Economy 1991–2001; Guo et al. 2007.

In addition to the agriculture insurance provided by PICC and China United, the Chinese government also explored insurance as a means to provide financial protection for farmers against natural disasters. In 1987, the Ministry of Civil Affairs issued an official notice on the launch of a trial in rural cooperative insurance for natural disaster relief.

A very limited number of counties/cities were selected to participate in the trial program. The program covered crops, farmers' houses, laborers' compensation, and large livestock. The cost of the premium was shared between the government, communities, and individual farmers (with the farmers responsible for the largest share). Under the policies, each household was to pay RMB 10 to 30 Yuan and the insured amount was approximately RMB 3000 Yuan. This program operated for 12 years, from 1987 to 1999, and it ended primarily because of its high loss ratio.

Natural disasters frequently occur in China, and their impact on agriculture is significant. From 1982 to 2006, insurance companies experienced the heavy burden of insuring crops and livestock against natural hazards, and the perennial high loss ratios forced commercially operated insurance companies to reduce their agricultural business. Farmers' incomes in China were still relatively low, and limited affordability prevented a growth in the demand for insurance. Despite a significant gap between agriculture insurance indemnity and agricultural losses caused by natural hazards, the development of agriculture insurance was relatively slow and, at that stage, it lacked a strong driving force. Thus, agriculture insurance from 1982 to 2006 did not meet the needs and requirements of China's developing rural economy.

3 Trial of a New Chinese Model of Agriculture Insurance

In 2004, another attempt at agriculture insurance was made at the national policy level. The study was assisted by supportive policies and the active encouragement of the China Insurance Regulatory Commission (CIRC). The Communist Party of China (CPC) Central Committee issued Document No. 1, *Several Policy-Related Suggestions of the CPC Central Committee and the State Council on Increasing Farmers' Income*, in 2004 (2004). The document suggested speeding up the establishment of a policy-based agriculture insurance system; the selection of a number of products and regions and to begin the trial; and the provision of premium subsidies to participating farmers in regions where local governments could afford such costs.

On 26 June 2006, another document, *Several Suggestions of the State Council on the Reform and Development of Insurance Industry* (Government of the People's Republic of China 2006), was issued that recommended the exploration of a new model of agriculture insurance, one with multilayered and multichannelled subsidies. The subsidies, from both the central and local governments, would be provided to participating farmers (as a premium subsidy) and insurance companies (as an administrative cost subsidy). The document also recommended exploring the establishment of an agriculture reinsurance system, via fiscal support from both the central and local governments. This document was considered to be a milestone in the history of Chinese agriculture insurance, because it provided a policy base for governmental financial support.

In 2007, the CPC Central Committee approved RMB one billion Yuan toward an agriculture insurance subsidy fund, and six provinces (Hunan, Jilin, Inner Mongolia, Xinjiang, Sichuan, and Jiangsu) were chosen to participate in the new agriculture insurance trial. From the beginning this new trial showed vitality and rapid growth. In 2007, the total premiums collected from agriculture insurance were approximately RMB 5.2 billion Yuan, an increase of 612.5 percent from 2006, accounting for 2.49 percent of all property premium types. Total agriculture indemnity was approximately RMB 2.7 billion Yuan, 2.83 percent of all indemnity payouts in property business. The total insured amount was over RMB 172 billion Yuan (Editorial Committee of Yearbooks of China's Insurance 2002–2010). In 2008, the agriculture insurance industry continued to grow rapidly and expanded into 17 provinces and regions. More than 0.5 billion Mu[i] of crops and 90 million farming families participated in the program. The total of all premiums collected was in excess of RMB 11 billion Yuan, and total indemnity exceeded RMB 7 billion Yuan. The total insured amount reached RMB 240 billion Yuan (Editorial Committee of Yearbooks of China's Insurance 2002–2010). In 2009, the total of all premiums collected reached RMB 13.4 billion Yuan, and total indemnity was RMB 9.5 billion Yuan. The total insured amount in 2009 was RMB 381 billion Yuan (Editorial Committee of Yearbooks of China's Insurance 2002–2010). Figures 3 and 4 show the premiums collected and the indemnity payouts for PICC and China United after the launch of the new program. The numbers from 2001 to 2006 are also plotted in Figures 3 and 4 to enable comparisons. The industry has experienced rapid growth since the implementation of the new program in 2007. By 2010, the new agriculture insurance program had been introduced in 25 provinces and autonomous regions. Figure 5 shows the areas that were covered by the program and received central government subsidies from 2007 to 2010.

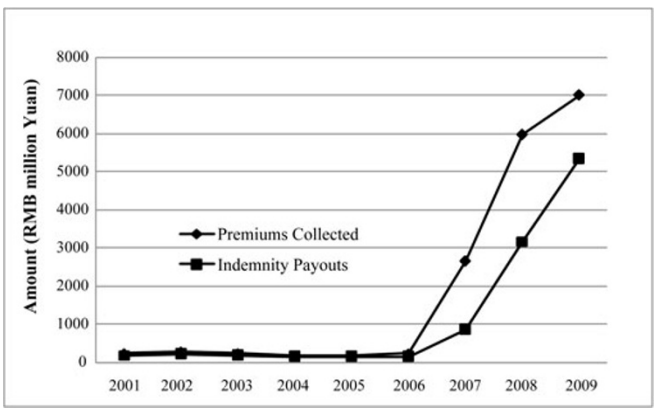

Figure 3. Profile of agriculture insurance for the People's Insurance Company of China (PICC) from 2001 to 2009
Source: Editorial Committee of Yearbooks of China's Insurance 2002–2010; Editorial Committee of Yearbooks of China's Economy 1991–2001; Guo et al. 2007.

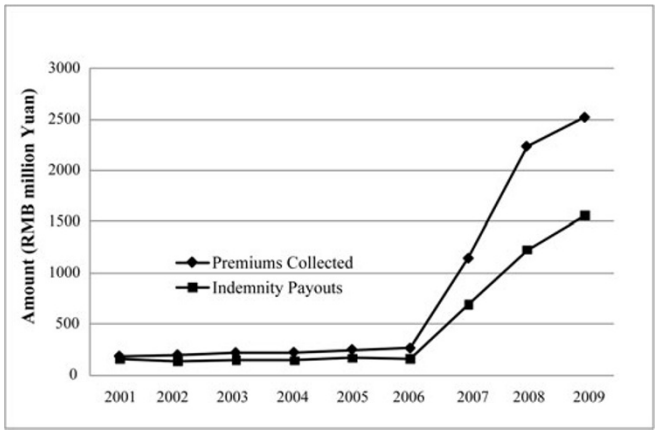

Figure 4. Profile of agriculture insurance for the China United Property Insurance Company (China United) from 2001 to 2009

Source: Editorial Committee of Yearbooks of China's Insurance 2002–2010; Editorial Committee of Yearbooks of China's Economy 1991–2001; Guo et al. 2007.

Some types of livestock were also covered under the new agriculture insurance program. Insurance for pig breeding was remarkably successful. In 2007, approximately 14.7 million breeding-pigs were insured under the program. By 2008, that number had increased to 47.6 million, and to 52.7 million in 2009, that is more than 75 percent of all breeding-pigs nationwide were insured.

The new round of insurance trials has completely revived a previously depressed and unstable agriculture insurance industry. With the expansion of agriculture insurance, many other kinds of insurance and financial products have become available in rural China, including endowment insurance for farmers involved in land ownership transfers, new rural cooperative medical insurance, and insurance for rural micro-credit. Thus, a new multidirectional rural insurance system has been gradually established.

3.1 New Models of Agriculture Insurance with Fiscal Support

The first six provinces in the new agriculture insurance program trial were Hunan, Jilin, Inner Mongolia, Xinjiang, Sichuan, and Jiangsu. PICC, China United, and Jilin Anhua Agriculture Insurance Company were selected to become the key participating companies. This new fiscally supported agriculture insurance operated on three general terms:

- The program covered seven natural disasters: rainstorms, floods, waterlogging, windstorms, hail, ice storms, and droughts. Certain diseases in crops and livestock were also covered.
- Premium rates varied from 3 percent to 10 percent of insured amount, according to region, crop, and peril.
- Low premiums were coupled with moderate insured amounts. Crop insurance only covered the basic cost of crops, including costs of seeds, fertilizers, pesticides, irrigation, machinery, and mulching film. Labor costs were excluded.

Though the newly launched program sends exciting signals to the market, there are some concerns about the

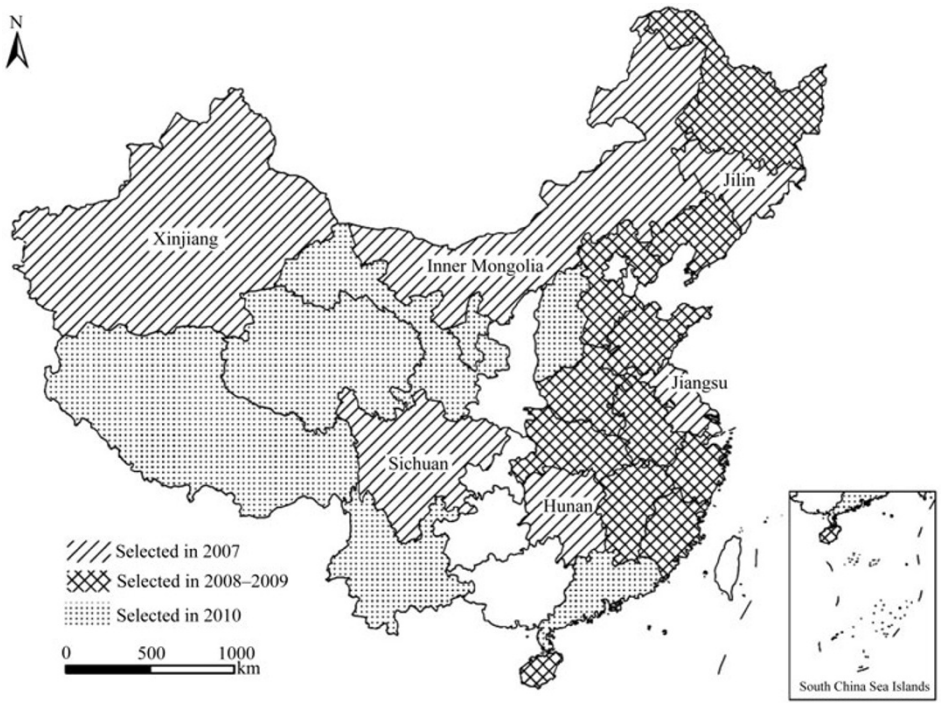

Figure 5. Chinese provinces and autonomous regions selected for the trial of the new agriculture insurance program and receiving central government subsidies from 2007 to 2010

premium rate system. In the trial program, premium rates are determined by provincial government and updated on an annual basis. However, there is no satisfactory quantitative risk assessment meeting actuarial standards, but only an estimation of the loss-cost ratio based on past experiences. This brings high uncertainty into the system as China does not have crop insurance business records long enough to make a good estimation, particularly for potential catastrophic years. Additionally, those estimated rates are often not actually applied as negotiations are quite common in the rating process because of the involvement of government funding.

The subsidies from both the central and provincial governments usually exceeded 50 percent of the premium amount. The subsidies from municipal and county governments varied region-to-region, but were usually between 10 percent and 30 percent. Policyholders (farmers) had to pay the remainder of the premium.

At the government level, independent fiscal accounts were created and independently managed. Provincial governments set aside capital sourced from annual agriculture insurance surpluses to be used as emergency reserves. When a large-scale disaster occurs and the indemnity payouts reach a certain threshold, the provincial governments can access the disaster funds to help insurers cover the losses.

Table 1 provides a summary of the crop insurance products, including the extent of the coverage, premium rates and subsidies, participating companies, fund management, and an overview of the operation in 2007 in the selected provinces. These provinces also explored different methods to promote this insurance program. Sichuan Province, for example, considered participation in the agriculture insurance to be a key precondition for the participation in other policy-oriented preferential programs (for example, farmers' microcredit program), and there were additional benefits (by way of financial support and loans) for agriculture insurance program participants.

3.2 Model of Operation

Various levels of government have different roles in the model of operation. The involvement of the central government

Table 1. Details of the crop insurance policies for the six provinces selected for the 2007 agriculture insurance trial

	Hunan	Jilin	Inner Mongolia	Xinjiang	Sichuan	Jiangsu
Coverage	Paddy rice, cotton, rapeseed	Corn, paddy rice, soybean, peanut, sunflower seed	Corn, wheat, soybean	Cotton, corn, paddy rice, wheat, soybean, rapeseed, peanut	Paddy rice, corn	Paddy rice, wheat, cotton, rapeseed, corn
Perils	Rainstorm, flood*, waterlogging, windstorm, hail, ice storm, drought, and certain diseases					
Insured Amount	Paddy rice: ￥240/Mu; cotton: ￥300/Mu; rapeseed: ￥150/Mu	Paddy rice: ￥267/Mu; corn: ￥200/Mu; soybean: ￥167/Mu	Corn: ￥230/Mu; wheat: ￥300/Mu; soybean: ￥170/Mu	Cotton: ￥400/Mu; wheat: ￥300/Mu; corn: ￥300/Mu	Paddy rice: ￥300/Mu, or ￥400/Mu (additional drought benefits); corn: ￥292/Mu, or ￥392/Mu (additional drought benefits)	￥300–500/Mu
Premium Rate	Paddy rice: 6%; cotton: 8%; rapeseed: 6%	Paddy rice: 8%; corn: 10%; soybean: 8%	Corn: 10%; wheat: 8%; soybean: 8%	Cotton: 7%; wheat: 5%; corn: 5%	Paddy rice: 5%, or 10% (additional drought benefits); corn: 5%, or 10% (additional drought benefits)	5% for all crops
Subsidies	Central: 35%; provincial: 25%; municipal/county: >10%	Central and provincial: 50%; municipal/county: 30%	Central: 25%; autonomous region: 50%; municipal/county: 10%	Central and autonomous region: 50%	Central: 25%; provincial: 25%; municipal/county: 20%	Government: >60%
Companies	PICC and China United	PICC and Anhua Agriculture	PICC, Anhua Agriculture, and China United	PICC and China United	PICC, China United, and Groupama	PICC, China Pacific Insurance, and China United
Overview in 2007	Premiums collected: 748 million Yuan; indemnity payouts: 440 million Yuan	Premiums collected: 689 million Yuan; insured amount: 7.7 billion Yuan; 49.27% of crops insured; > 2 million families involved; insured amount for livestock: 1.4 billion Yuan	40.62% of crops (corn, wheat, soybean) covered; 1.2 million families involved	Premiums collected: 757 million Yuan (ranked No. 1 in China); 88% of cotton covered; 58.9% of breeding pigs covered	Premiums collected: 740 million Yuan; indemnity payouts: 197 million Yuan; 15.46 million live pigs and 4.91 million breeding pigs insured (ranked No.1 in China)	Premiums collected: 449 million Yuan; indemnity payouts: 369 million Yuan; insured amount: 10.3 billion Yuan; 88.54% of paddy rice insured

* Officially specified districts for water detention and diversion are excluded.

illustrates the strong national policy guidance, and its subsidies encourage the enrollment of all stakeholders. Because this trial run should take into full consideration regional economic development and agricultural production, the role of provincial governments is to work with insurers at the provincial level to formulate the policy details and associated regulations. The involvement of local governments mainly focuses on the promotion of the trial program and provides necessary technical assistance to local insurers. A typical operation model is depicted in Figure 6. The solid arrows denote payment, and the dashed arrows denote the submission of a budget and the transaction report. The government subsidy operation can be summarized in five steps:

- Step (1): Farmers pay the partial premium to the county-level insurers, forming a valid policy. In the case of Hunan, farmers pay about 30 percent of the total premium to insurers.
- Step (2): The county-level insurers send the valid policies to the county-level local government, usually the Bureau of Finance, who then pays the required subsidies.
- Step (3): At the end of the fiscal year, the provincial government has the required subsidy funds available (based on the aggregated data of valid polices for the year). Once the provincial government subsidy fund is in place, the central government pays the required subsidies to the provincial government. In the case of Hunan, the central government pays 35 percent of the total premiums to the provincial government.
- Step (4): The provincial government pays the subsidies from both the central and provincial governments to the provincial-level insurers. In Hunan, for example, 60 percent (35 percent + 25 percent) of the total premiums is paid to the provincial-level insurers.
- Step (5): The provincial-level insurers reserve 25 percent of the total premiums as a disaster fund for future large losses, and pay the remainder of the subsidies to the county-level insurers. In Hunan, 35 percent of the total premiums are paid by the provincial-level insurers to the county-level insurers.

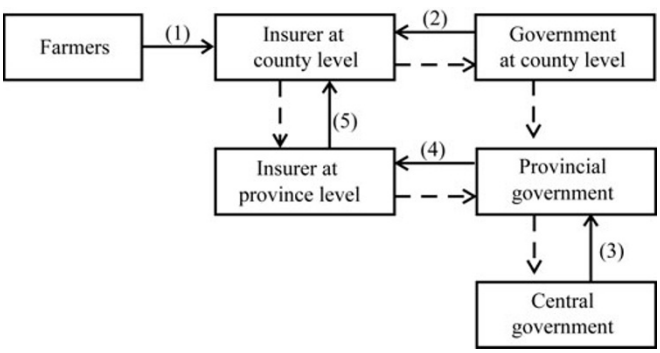

Figure 6. Schematic drawing of an operation model for an agriculture insurance trial

3.3 Disaster Fund

The disaster fund system was established to hold the annual surpluses of the agriculture insurance industry. For example, approximately 70 percent of the surplus from paddy rice insurance and RMB 8 Yuan per breeding-pig were placed into the fund. Different provinces have slightly different regulations regarding the use and management of their disaster funds. In general, insurers are suggested to reserve their surplus from agriculture insurance as a disaster fund for future catastrophic losses. Insurers are also encouraged by government to cultivate rural insurance markets by using the opportunity of this agriculture insurance trial to explore other profitable rural insurance business.

In addition to the insurers' funds, the government also helps to promote the establishment of disaster funds via financial support. In Jiangsu Province, a disaster fund has been established for each municipality. The fund consists of three parts. The first represents 10 percent of the total premiums collected by county-level insurers. The second is a matching fund from municipalities, which usually accounts for 50 percent of the total fund returned by county-level insurers. Finally, once the funds from both a county and municipality have been received, the provincial government matches all the previous contributions to 100 percent. The disaster fund is managed by the Bureau of Finance in each municipality under an independent account.

When a large-scale disaster occurs, the fund is applied by using the premiums collected in the present year first; then the reserved funds from the agriculture insurance companies; and finally, the government-supported disaster fund is accessed.

3.4 Other Regional Trials in Agriculture Insurance

While specific operational details may vary among the six trial provinces, in general they follow the principles and operation model discussed above. In 2007, when the trial was first introduced to these provinces, a number of other provinces and autonomous regions also began their own regional trials in agriculture insurance. Shi et al. (2008) have commented on the two unique models implemented in Beijing and Zhejiang Province. In Beijing, the government provides a 50 percent premium subsidy to the farmers and a 50 percent operating cost subsidy to insurers; 0.1 percent of any added value of agriculture from the previous year are withheld and placed into the agricultural disaster risk reserve fund. When the insured loss ratio reaches 160 percent, the government compensates the insurance companies from the disaster risk reserve fund. Zhejiang Province employs a totally different model, in which the government plays an important role in loss-sharing. The 12 participating insurance companies are members of the Agricultural Policy Insurance Union of Zhejiang Province. The loss-sharing mechanism is defined and operated on the basis of the level of insured loss (Shi et al. 2008). The aim of this policy-based program is to share the risk among the main stakeholders, that is the farmers, governments, and insurers.

4 Field Survey and Investigation Findings

We have been conducting field investigations and surveys in Hunan Province since 2007 to study the trial of policy-based agriculture insurance. Workshops and surveys have been conducted among the major stakeholders, including:

- Government officials at provincial, municipal, county, and village levels who supervise, manage, or assist the insurance programs. They include officials from the Bureaus of Finance, Civil Affairs, and Insurance Regulations.
- Insurance companies at provincial, municipal, and county branches who operate the program. They include managers and professionals from both PICC and China United.
- Farmers randomly interviewed in different counties, who may or may not be participating in the insurance program.
- Other government officials and professionals who provide technical support to the program. They are, for example, from the Bureau of Agriculture and the Meteorological Bureau.

As shown in Figure 7, only 15.1 percent of the farmers interviewed in 2007 were aware that a new agriculture insurance program was available. This percentage continued to increase and reached 30.5 percent in 2008, 64.9 percent in 2009, and 81.7 percent in 2010. Of the 566 farmers interviewed in 2009 who were aware of the new agriculture insurance program, 67 percent learned of its introduction from village officials or official documents (Figure 8a). Thus, the introduction and promotion of insurance programs by local governments, especially village officials, and its fiscal subsidies, have played an important role with regard to the farmers' increased awareness of the availability of agriculture insurance.

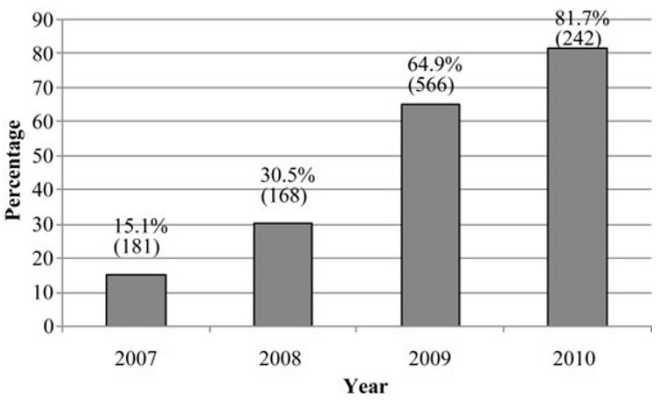

Figure 7. Percentage of interviewed farmers in Hunan Province who were aware of the availability of the new agriculture insurance program (the numbers in brackets are the sample sizes of the surveys)

The field survey and investigation resulted in an improved understanding of how well the trial progressed, and it created the opportunity to receive the comments and suggestions of the various stakeholders involved in the insurance programs. The investigation in Hunan showed that although the pilot work has achieved good results, a number of problems remain.

Despite annual increases in the percentage of farmers that were aware of the available insurance programs (see Figure 7), very few farmers received actual program advice from insurance companies (see Figure 8a)—their usual channels of information were from government officials and village heads. A key disadvantage in not receiving information from insurance professionals is that the farmers may not be aware of many of the policy details. As Figure 8b shows, of the farmers who were aware that insurance was available, 57.8 percent were not aware of the details of the agriculture insurance policies, and only 14.1 percent felt familiar with the policy details.

4.1 Feedback and Concerns of Participating Insurance Companies

The companies participating in the insurance programs believe that the new agriculture insurance trials can help them extend their businesses to include a potentially huge market, that is the rural areas where the majority of the Chinese population live. The financial support (subsidies) offered in the trial encourages insurers to operate in the area of agriculture insurance. However, the participating companies also face difficulties:

(1) High operating costs: The participating insurance companies, especially county branches, have experienced relatively high operating costs in carrying out their many duties, from introducing the program into villages, to premium collection and post-disaster claim settlement. Three factors have been identified as causing the high operating costs:

- Many villages are isolated and dispersed, resulting in high transportation costs to access them.
- Many rural areas in China lack other relevant insurance products for farmers. Therefore, the effort and operating costs required solely for agriculture insurance are not considered efficient.
- Nearly all counties in China now have insurance offices. However, very few offices have been opened in the villages or towns.

(2) Difficulty in claim adjustments: Insurance companies sometimes fail to make an insurance payout on time because they find it difficult to accurately adjust the claim within a limited time frame. This is unsatisfactory to the policyholders who have experienced a loss. Three reasons account for this delay:

- Farmers usually enter into a group policy with other farmers from the same village or town. The group policy shows only an aggregate number of crops insured. During the

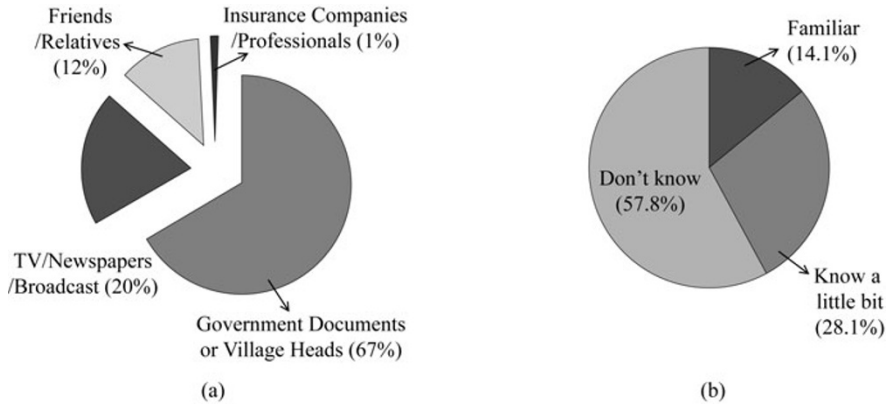

Figure 8. Channels through which farmers in Hunan Province are informed about the availability of the new agriculture insurance program (a) and the degree of familiarity with policy details (b)

process of claim settlement, the insurance companies face great difficulty identifying the property of individuals.

- A reliable database does not exist with regard to the crops of individuals, which increases the difficulty of loss adjustment.
- The insurance companies do not have a sufficient number of professionals to process the large number of small claims.

(3) Gap between government control and market-operated businesses: One of the basic principles of the agriculture insurance trial is that of "market operation." However, the insurance companies usually find it impossible to operate a purely market-based program. It is difficult, for example, for insurers to operate following the low premium rate determined by the government—the insurers are only allowed to adjust the premium rate slightly, even under the principle of "market operation." The agriculture insurance program has become a responsibility assigned by government, and the government does not appear to attach sufficient importance to the opinions and comments of the insurers. In the original design of this program, the role of government was to promote and guide the program via fiscal support. However, the "guiding" role of government has gradually become a "leading" role, and the government has exerted control in many aspects of the program's business operation. Therefore, the insurers find it difficult to assert their roles in the program.

(4) Lack of confidence in the sustainability of the program: As the insurers' roles in the design of the trial program (for example, premium rates, coverage, and subsidies) are limited, they are not confident of their ability to cover losses from a large-scale disaster, such as in the case of the 1998 flood that damaged 22.3 million hectares of crops (Ministry of Water Resources of the People's Republic of China 1999). This is despite the fact that the participating insurance companies are aware that the current agriculture program with fiscal support can be profitable in the short term.

4.2 Feedback and Concerns of Farmers

The main incentive for farmers to participate in the program is to obtain sufficient compensation in a disaster to enable them to resume their agricultural production. It is for this reason that farmers pay close attention to the premium rate, the insured amount, and coverage. The current premium is generally considered to be reasonable and acceptable by farmers, and the current coverage is sufficient for most of the risks farmers face. It is the insured amount that the farmers are unhappy about.

(1) Low insured amount: The insured amount is considered to be low. The original design of the agriculture insurance was to insure the basic cost of production. For example, the insured amount for paddy rice in Hunan is RMB 180 Yuan per Mu for the seedling period and RMB 280 Yuan per Mu for harvest time (2010 policy). However, according to our field survey, as shown in Table 2, the basic costs, for example, for seeds, fertilizers, pesticides, irrigation, and machinery, can be much higher than the insured amount, even with labor costs excluded, especially for late season rice. The low insured amount discourages farmers from purchasing insurance because the indemnity amount is considered too low when compared with their potential loss of income, usually RMB 750 Yuan per Mu (2010 survey data). This also explains why the insurance policies with regard to breeding-pigs and cows are more attractive to farmers. The insured amount of RMB 1000 Yuan per breeding-pig and RMB 4000 Yuan per cow (2010 policy) are more in line with the economic value of pigs and cows.

(2) Priority of disaster reduction: Many farmers have commented that the government should first help them to increase their capabilities against natural disasters, especially with regard to improvements in irrigation facilities and infrastructure. Based on our survey results conducted in Hunan, more than 58 percent of the farmers believe that the top priority of the government in disaster reduction and mitigation should be "to increase investment to build up a better

Table 2. Comparison between basic cost of paddy rice in Hunan Province (data from 2010 field survey) and current insured amount (data from 2010 insurance policy)

	Basic Costs (seeds, fertilizers, pesticides, and facilities rental, with labor cost excluded, 2010 survey data) RMB Yuan				Insured Amount in 2010 Policy RMB Yuan		
	Mean	Standard Deviation	25 Percentile	75 Percentile	Seedling Period	Tiller Period	Ripe Period
Early Season Rice	292	101	228	340	180	240	280
Late Season Rice	348	98	289	400	180	240	280

capacity against disasters," with only 24 percent believing that it should be "to provide a subsidy for agriculture insurance."

(3) Lack of sufficient trust in insurers: Some farmers have little trust in insurance companies, and their main concern is that they may not receive a payout after a disaster. This belief is based largely on previous negative settlement experiences with insurance companies, particularly during the early 1990s when the insurance market in rural areas grew rapidly yet insurance regulations and laws were not enacted or enforced.

4.3 Feedback and Concerns of Local Governments

(1) Urgent need of regulations and laws: The associated regulations and laws, with regard to the current agriculture insurance and fiscal support, have not been explicitly covered by the Insurance Law (Government of the People's Republic of China 2009). However, agriculture insurance, as an important component of the institutional design to develop and protect agriculture, relies heavily on the enforcement of the associated regulations and laws. A law to standardize and protect the activities of the stakeholders in the agriculture insurance business is urgently required.

(2) Role of local governments: Most county-level governments find it difficult to pay the subsidy from their limited fiscal budgets. They should only be required to assist local insurance companies to promote agriculture insurance and to provide technical support and policy guidance.

(3) Need of risk-sharing structure: A multilayered risk-sharing structure should be established. The current disaster fund is still in its early stages and cannot provide sufficient financial protection for potential large-scale disasters. The participation of reinsurance companies, particularly international reinsurers, is critical.

4.4 An Example of Good Operating Practice

Despite the various difficulties and challenges faced by stakeholders, Changde Municipality in northern Hunan Province has achieved success in its agriculture insurance business, with a high take-up rate and a high percentage of voluntary participation initiated by farmers (50 percent or higher in many towns in 2010). Changde's success was aided by the implementation of innovative policies at the local level. Figure 9 shows the new operation model for Changde, in which most towns have appointed task officials to administer agriculture insurance. Generally, the task officials have had previous experience in financial management or civil affairs management. The task officer for each township becomes a facilitator to ensure good communication between insurers and local communities. In this operation model, an insurance assistant is assigned for each village, with the candidate generally being an accountant or village clerk, and experienced in financial management.

Premium Collection: It is the role of the insurance assistants and task officers to introduce and promote agriculture insurance within local communities. Farmers pay the premiums directly to the insurance assistants, and they then forward the collected premiums and the policies for the entire village to the task officer. Once the premiums and policies for all the villages within the township have been received, the task officer forwards the premiums and policies to the county branch insurer and reports to the county government.

Loss Adjustment: After a disaster, the village insurance assistants first assess any losses by the farmers and report this to the task officers. The task officers then return to each village to review and double-check the losses. After receiving loss reports from the task officers, the insurers at the county branch send in professional assessors to conduct a spot-check on the reported losses.

In the Changde model the county-level government, instead of providing a 10 percent premium subsidy, has assigned officers in every township to ensure the effective operation of the program. Therefore, the presence of task officers has eased the significant burden of operating costs of insurance companies, and county-level government can now focus on improving service quality and developing other rural insurance products. For those farmers who have never had insurance or do not trust insurance companies, this new model provides alternatives through which they can buy insurance directly from the insurance assistants—people they know well from their own communities. As the trust between insurers and farmers is established and more insurance branches are introduced in the townships, government participation can be gradually withdrawn and their focus can shift to the management of the reserve fund. The Changde model of policy implementation solves many issues and it shows a new way of government support, other than just financial support, for policy-based insurance. However, the

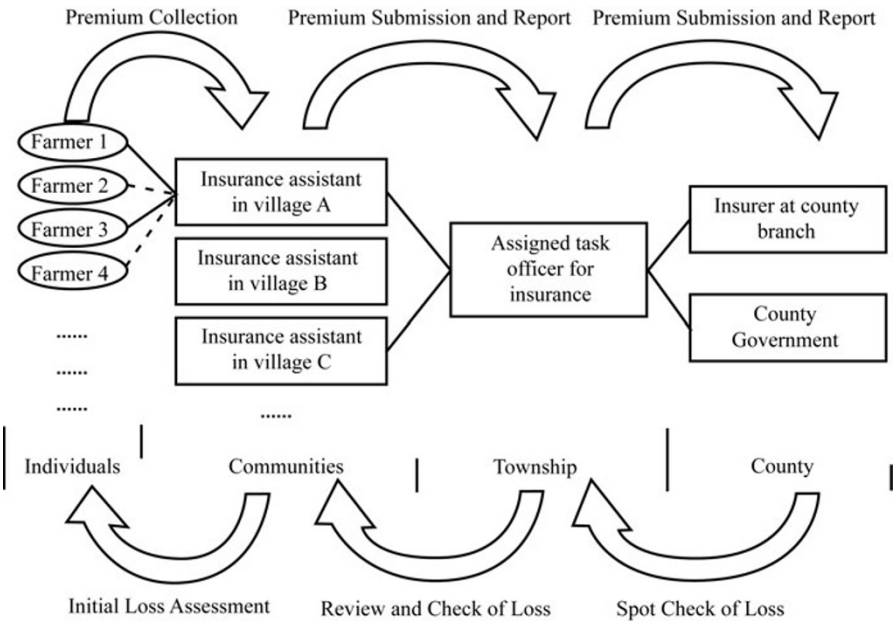

Figure 9. Operation model for Changde in northern Hunan Province

Changde model also faces some challenging questions. Should the assigned task officers and insurance assistants be paid? If so, by whom, and through whose accounts? Without clear regulations or laws to standardize task officers and insurance assistants' responsibilities and to protect their benefits, the new operation model and its good operating practices will not be sustainable.

5 The Four Principles of the Agriculture Insurance Trial

It is important to recognize the four basic principles used in the agriculture insurance trial: guided by government; market-oriented operation; voluntary participation; and propelled under joint forces. The first principle, "guided by government," determines the role of government. The main role of government in the trial is to provide subsidies to the farmers who want to purchase agriculture insurance, thereby creating affordable policies and assisting market growth. The government both initiated and promoted the insurance program, and it encouraged the farmers and insurance companies to participate. The government subsidies have helped to create a new market in rural China. However, the first principle also clearly implies that government responsibility with regard to this program is limited, and that the government does not share responsibility for any of the insured losses with the participating insurance companies, even when those losses are significant.

This implication is also emphasized in the second principle of "market-oriented operation." The operation of this program relies on commercial insurance companies, and the participating insurance companies should accept all the associated risks. Insurers need to rely on market mechanisms to develop their agriculture insurance businesses and should treat their businesses the same as any other commercial insurance business, from policy sales to the settling of claims. Moreover, the insurers should work with other industry partners and take advantage of market capital to diversify and transfer their risks. The first two principles indicate that the role of the government should not be overemphasized in the new agriculture insurance trial. Although the initial support from the government by way of promotion and financial support has been important, the program is designed to enable the insurance industry to lead the way.

The third principle, "voluntary participation," determines that program involvement is voluntary, especially with regard to the farmers. Farmers themselves decide whether to purchase agriculture insurance for their crops and livestock based on their understanding of the actual risk and the affordability of the policies. While the government subsidies may encourage farmers to participate during the initial stages, whether the products meet the farmers' true needs and whether farmers are satisfied with the insurers' services will directly determine the sustainability and vitality of the program in the long term.

The fourth principle, "propelled under joint forces," indicates that multiple stakeholders are involved in the program, based on the special characteristics of agriculture insurance. The government provides both subsidies and policy guidance, and central, provincial and city/county governments are all involved. Other government institutions, such as the Meteorological, Agriculture, and Water Resources Bureaus, also participate to provide technical support, especially with regard to disaster mitigation and loss adjustment.

6 Discussion and Recommendations

6.1 Further Development of Government Support

China is a nation with a large agricultural base and a dominantly rural population—it is also a country that experiences many natural disasters and numerous losses in agricultural production. The impact of natural disasters on agricultural production in China has a strong correlation with the poverty issues of rural households. Moreover, agricultural production is one of the least profitable industries in China. In 1978 the wheat price, for example, was only slightly higher than RMB 0.1 Yuan per 500 grams, while the average monthly salary of a university graduate was approximately RMB 40 Yuan. By 2008, the price for wheat was RMB 0.7 Yuan per 500 grams, and the average monthly salary of a university graduate had increased to more than RMB 1000 Yuan. Increase in the price of wheat has been too slow when compared with that of salaries. With this in mind, China's agricultural production—characterized by inadequate technology levels, high disaster risk, and low profit—requires greater government guidance and support to ensure the success of the program. The international experience with agriculture insurance also indicates that most good operating practices and success stories can be linked to the effective support from both the government and the industry.

It is possible to diversify the means of government support to agriculture insurance. As such, government support in China should focus on the following aspects.

(1) Fiscal subsidies: The high insured loss ratio and high premium rates have always discouraged both insurance companies and farmers from converting the agriculture insurance industry into a completely commercial market. Government financial participation in agriculture insurance is classified as the Green Box support under the *World Trade Organization Agreement on Agriculture* (WTO 1995). The main question with regard to fiscal subsidies in China is how to increase and strengthen government subsidies and to allocate the funding effectively and efficiently.

The agriculture insurance subsidies should be included in the central government's fiscal budget, and a mechanism of enduring effect should be established to support the program. Both the central and provincial governments share the cost of the subsidies. The subsidies from county government should not be mandatory, and county government should focus on providing technical support and policy guidance to ensure the smooth operation of the agriculture insurance in the local communities. Moreover, the subsidies from government should reflect the principle of policy guidance. The priority of subsidies should be given to key crops that are directly linked to the national strategy of food security. Based on actual needs, subsidies for different stakeholders should be considered. First, premium subsidies for the participating farmers should be considered, and these subsidies could then motivate farmers to purchase agriculture insurance and increase the geographic coverage of the policy up-take. Second, attention should be turned to a subsidy for the operating costs of participating insurance companies. This subsidy would encourage insurers to expand their business to include more rural areas. Third, an incentive subsidy should be considered to encourage risk transference to international market capital via reinsurance.

(2) Tax incentives: International experience shows that tax incentives are widely used in agriculture insurance. Currently, only business taxes with regard to agriculture insurance services are exempt under the *Detailed Rule for the Implementation of the Provisional Regulation of the People's Republic of China on Business Tax* (Ministry of Finance 1993)—there are no other tax incentives for agriculture insurance. This situation is not helping with the growth of the agriculture insurance industry. Therefore, tax reductions or exemptions on income tax and other taxes incurred by participating insurance companies should be considered, even if just for a short period to aid the development of the agriculture insurance market. Any expenses incurred in purchasing agriculture insurance should be exempt from income tax.

(3) Other financial support: Various financial support mechanisms should be considered to provide financial protection for both participating farmers and insurers. Agriculture credit should be given to farmers who have purchased agriculture insurance. A relevant policy should be created to allow participating insurers to apply for interest-free or low-interest loans when they experience significant losses in agriculture insurance, which can result in serious problems for their company's operation. Other financial support may include establishing a national disaster risk fund for agriculture insurance or developing disaster securities. These financial support methods can significantly reduce the devastating impact of large-scale disasters on this emerging agriculture insurance system.

(4) Relaxing the restrictions on the reach of the insurance industry: Current restrictions on the reach of the insurance industry should be relaxed for participating insurance companies, and other insurance products specific to farmers (for example, farmers' short-term health insurance and farmers' accident injury insurance) should be allowed and encouraged. In this way, the costs for insurers to cultivate the rural insurance market and business expenses can be addressed with greater efficiency.

6.2 Recommendations to Improve the Operation Model

Three major issues should be considered with regard to the operation model for the trial agriculture insurance program. First, the willingness of insurers and farmers to participate largely depends on government subsidies, raising the key questions of how to design an appropriate subsidy model and subsidy levels. Second, the information asymmetry between insurers and farmers can generate issues of adverse selection and various moral issues. Therefore, the strengthening of supervision and management in the business operation is critical. Finally, the commercial insurance market is still

immature in China and insurance companies are finding it difficult to determine reasonable and realistic coverage and premium rates based on the consideration of regional differences in disaster risks, agriculture production, and economic development. The following recommendations are proposed to improve the operation model.

(1) For crops that are of vital importance to national food security (for example, wheat, paddy rice, and corn), the premiums to be paid by the farmers should be further reduced. Alternative payment methods should also be made available to farmers. For example, the central and provincial governments could allocate supportive counterpart funds for agriculture insurance, and the funds would then be used to pay 100 percent of the premiums to insurers. Farmers would then repay the funds in cash or with crops under the circumstance of an "average" harvest/yield being achieved.

(2) Participating insurance companies should emphasize the model of "independent account set-up and management." The premium income from the agriculture insurance can only be used for claim payouts and operating costs, and any surplus should be held in reserve in the disaster fund.

(3) The participation of farmers could be secured with either a group policy or an individual policy. Whatever the situation, a copy of the insurance policy must be given to every insured individual. The relevant information needs to be discussed and disclosed in the participating villages to promote transparency in the operation of agriculture insurance.

(4) The associated government and professional institutions should provide support with agriculture risk assessments and insurance regionalization, as these tasks ultimately depend on the large amounts of data collected over the years. However, the final decision with regard to premium rates and coverage should remain with the insurers and be adjusted by the market. For example, in 2009 a number of industries (forestry, pigs, and hybrid rice) were selected in certain provinces to participate in a trial of an entirely market-based operation.

6.3 The Need to Further Enhance Capabilities against Agricultural Disasters

Agricultural infrastructure within most areas in rural China is still very vulnerable to natural disasters, especially to drought and waterlogging. Both the government and the insurance industry cannot afford to cover losses arising from large-scale, or even small-scale, disasters every 3–5 years. Therefore, the prerequisite to establishing a sustainable agriculture insurance system is that the agricultural infrastructure must have the basic capability to deal with, at the very least, a once every 10-year natural disaster. Otherwise, the disaster fund will not be able to build to the appropriate level to cope with large-scale disasters in the future. Therefore, local governments should continue to strengthen their investments to further build an agricultural infrastructure to alleviate the impact of any disaster, and to make full use of agriculture insurance for the purpose of risk transference.

7 Conclusion

In the past 60 years, the agriculture insurance of China experienced several distinct stages of development. The new trial run of agriculture insurance launched in 2007 has shown its vitality and experienced rapid growth of business. This is in contrast to the agriculture insurance profiles in the late 1990s and early 2000s when the agriculture insurance business continued to shrink because of its high loss ratio. This dramatic change is mainly due to the government policy initiative and subsidies in support of the new agriculture insurance trial. However, many issues remain in the current practice. First, the rapidly growing business of agriculture insurance urgently requires a law to standardize and to protect the activities of the stakeholders that are not explicitly covered by the current Insurance Law. Second, the role of government in the policy-oriented trial should be clearly defined, and any government involvement should always take into full consideration the potential conflict with market-oriented operations and mechanisms. Third, although the survey data show that more and more farmers are aware of the trial program and have started to participate, most insurers have not established their business network to reach most villages in China. Innovative models of operation that aim to resolve the difficulties of both farmers and local insurers are necessary.

It is believed that the government subsidy model in the current trial run does promote the emergence of a vigorous agriculture insurance market in China. More and more farmers are receiving insurance coverage with the expansion of the trial program. Nevertheless, there are several issues that require careful analysis from the economic perspective. For instance, do the heavy subsidies induce exacerbated moral hazard issues as happened in the United States? Also, with the subsidies from tax revenue, all taxpayers share the cost of crop insurance, and it has not been well justified from the viewpoint of efficiency and equity. Finally, there are plenty of approaches for the government to provide aid to farmers. Whether the subsidies have created the right incentives, made farmers better off, or even increased social welfare, remains a question for further study.

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Note

i 1 Mu = 0.0667 hectare.

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