

THE INVOLVEMENT OF GOVERNMENTS IN THE DEVELOPMENT OF AGRICULTURAL INSURANCE

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Abstract

Agricultural production is a risky sector because its yields heavily depend on weather and other unforeseeable and uncontrollable factors. Therefore, agricultural insurance is critical to stabilize food market and farmers' income. Through analysis, this article found that it is necessary for governments to involve in the operation of agricultural insurance programs. However, the investment should not in subsidizing premium as it is happened. In alternative way, the governments should involve in building modern infrastructure that can provide valued, accurate historical and forecasted data of weather and market; enhancing legal and regulatory system; providing educational programs to farmers and subsidizing to insurers to kick start insurance market.

Keywords: Agricultural Insurance, Government Involvement, Insurance Policy, Insurance Development, Agricultural Finance

INTRODUCTION

Agricultural yields and product prices are instable. Agricultural production is based on the allocation of natural resources such as soil and water. Therefore, its outcome may be volatile due to the fact that natural phenomenon is difficultly foreseeable and controllable. Hence, agricultural is a risky sector (Elena, Constantin & Flavia 2009). It means there is a source of risks during agricultural practices including both climatic aspects such as adverse weather [floods, droughts as well as diseases] and man-made ones such as fires. As a result, the yields and prices of agricultural goods are difficultly guaranteed that have an adverse impact on food security, farmers' income as well as the stabilization food market. In order to reach the stability in agricultural production, insurance schemes are necessarily launched.

Objectives of this report are to review and analyze conceptual framework of agricultural insurance, its benefits and the necessary of governments' involvement. In order to satisfy this objectives, this report will not discuss in detail types of agricultural insurance, just endeavor to build the analytical framework from the concepts of agricultural insurance, its problems, its benefits, the involvement of government to its sustainable development as well as experiences from agricultural insurance program over the world based on synthesizing and analyzing research conducted in relation to this field.

LITERATURE REVIEW

Conceptual Framework of Agricultural Insurance

Agricultural insurance services are the exchange of risk from farmers to insurance providers. In the context of insurance contract, the purchasers (farmers) will transfers their production risks to insurers by pay a small sure loss (premium) to eliminate uncertain massive loss in the future (Keith et al. 2003). This means when the unexpected occurrences of climatic or market aspects decrease yields or product prices of insured agricultural production under the level stated in the insurance contract that has negatively effect on farmers' income, some compensation to cover their loss would be provided by insurers.

There are many types of risks that occur during agricultural practices that can be seen from table 1. They can be categorized into 2 groups: systematic and unsystematic risks. Systematic risks such as production, market, institutional or financial are unforeseeable and uncontrollable. However, unsystematic risks like assets or operational happen randomly, individually effect and can be controllable. During agricultural practices, the occurrence of these types of risks is possible leading to uncertainty in outcome such as crop yields and farmers' income. Therefore, in this case, agricultural insurance is necessary for ensuring sustainably agricultural practices.

Table 1: Types of Risks during Agricultural Production

Type of risk	Description
Production	Climatic aspects, plant and animal diseases
Market	Uncertainties about prices for both inputs and outputs
Assets	Loss or damage of assets because of fire, accidents or theft
Institutional	Policy changes
Financial	Interest and exchange rate movement
Operational	Uncertainties and risks related to health and personal relations

Source: Elena, Constantin & Flavia 2009

There are several kinds of agricultural insurance. Firstly, crop insurance is the oldest that was developed first in the United States of America in 1939 under the management of the Federal Crop Insurance Cooperation that was set up as yield insurance (Hueth & Furtan 1994). In this type of crop insurance, when the collapse of a farmer's actual yield to below some predetermined yield is found, the payment of indemnities would occur. The program has changed over the time depending on the geographic areas and crops, the level of subsidy attached to premiums, the calculation of the threshold yields, the method of payment of premiums and indemnities as well as the timing and length of contracts. The crop insurance was also developed over some countries in the first half of the last century. They are known as rent insurance in Japan in 1939 as well; as a production cost insurance in Brazil in 1940s in which coverage was based on out of pocket production cost and therefore the payment of indemnities would occur when yields are too low to cover the expenses of agricultural production as is equal to the shortfall; as compulsory crop insurance in Sweden in 1961 (Hueth & Furtan 1994). All of such crop insurance are compulsory and premiums are heavily subsidized by governments. Secondly, credit insurance is another type of agricultural insurance. Coverage is based on the amount of credit extended to a farmer and the insurance is compulsory for access to official credit. Indemnities are equal to loan repayment less revenue from harvested crop. There are many countries developing credit insurance including Brazil, Mexico, Panama, the Philippines, Sri Lanka and India (Hueth & Furtan 1994).

In term of economics, public crop insurance satisfies two related manners with other policies including producer subsidy measure and risk management measure. In the first way, the expected values of commodity prices, farm incomes and other economic variables is likely to be the expected result of crop insurance. In addition, in the second one, the provision of crop insurance is expected to supply stabilization services of value to farmers apart from any subsidies (Hueth & Furtan 1994). The reasons are: the mean values of prices and income would be affected by these stabilization benefits and the demand for quantity stabilization may be driven by price supports.

An incentive to greater output is supplied by crop insurance. This is due to the fact that the premium subsidy is effectively an input subsidy for farmers who purchase insurance and the existence of all-risk insurance motivates risk-averse farmers to produce agricultural products who otherwise may not (Hueth & Furtan 1994).

Agricultural Problems

There are several unique issues of agricultural insurance. These include Absence of pooling, Moral hazard and adverse selection. Therefore, the development of agriculture may be negatively affected by these difficulties.

Firstly, the absence of pooling is the first difference of agricultural insurance that has little potential gain from the pooling of similar risks. This is because in case of agricultural insurance, when risks occurs in specific area, all the farms in that area would suffer from the consequences caused by the risks and correlations might be high even for large regions (Zhang 2011). While other insurances like life and motor vehicle insurance, individual risks are uncorrelated (Hueth & Furtan 1994). Therefore, agricultural insurance requires the involvement of organizations or governments who have large portfolios and returns uncorrelated to production risk.

Secondly, the occurrence of the moral hazard dilemma is due to the fact that farmers can heavily affect their final yields beyond their production decisions. They can decide whether or not to utilize pesticides and fertilizers or high or low yield varieties. Insured farmer usually face lower losses with the occurrence of crop failure. The reason is, according to Hueth and Furtan (1994) they intend to choose high yield varieties that are highly susceptible to drought or insect attack. If the season is good, the insured farmer reaps the benefit. If it is bad, the insurer bears part of the cost. It is reported in Goodwin (2001) the less use of fertilizer and chemicals valued about \$4.23 per acre on insured Kansas wheat was occurred compared with before the time Kansas wheat was not insured.

The third issue of agricultural insurance is adverse selection. Farmers can decide which crops they can choose to be insured. Therefore, if their yields are lower than average -the yield insured (either due to poor soil or poor management), they will decide to insure those crops. Otherwise, if their yields are generally higher than average, those crops will not be insured. In addition, in the farm level with constrains of good soil, budget, as well as management level, the farmer can focus their investment on crops that are not insured to gain the high yield. Otherwise, those crops insured are likely to be not invested by the farmer then if the yield under insured quantity, the indemnity will be paid. For example, a farm has a various quality of soil, if

they chose rice to be insured that would be cultivated in the worse quality soil and maize that is not insured would be grown in the better quality soil.

Benefits of Agricultural Insurance on Agricultural Practices

Agricultural insurance has a positive effect on land use decision. More crops are likely to be motivated by crop insurance. That is due to the fact that it allows the farmer to insure tracts of land with different crops separately.

Agricultural insurance might be the effective tool of environmental policy. It is argued that the more risk averse producers are, the more they are involved in harmfully environmental practices to guarantee their productivity (Keith et al. 2003). Hence, the reduction of such risk-averse behavior is likely the result of agricultural insurance program leading to less environmental damage.

Agricultural insurance plays an essential role in food security. Farmers are likely risk averse. They usually diversify their crop portfolio to minimize their risks, especially in some areas where natural disasters usually happened like dry land. For example, farmers can mix of crop with various kinds of plants that have different risk exposure with the weather or even spread their investment in many industries to reduce uncertain outcome when risks occur. According to Hazell and Hess (2010) these can result in the decrease in agricultural investment that is likely to adversely affect food security. However, if agricultural production is insured, farmers can be intensive their agricultural practices. Moreover, it is claimed that the expansion of agricultural production of a farmer including borrowing more capital is likely to be led by the reduction of risk. As a consequence, governments should involve in agricultural in order to ensure an abundant supply of food and fiber products at reasonable prices. In order to reach this objective, farmers should be assisted by government to manage their risks (Hueth & Furtan 1994).

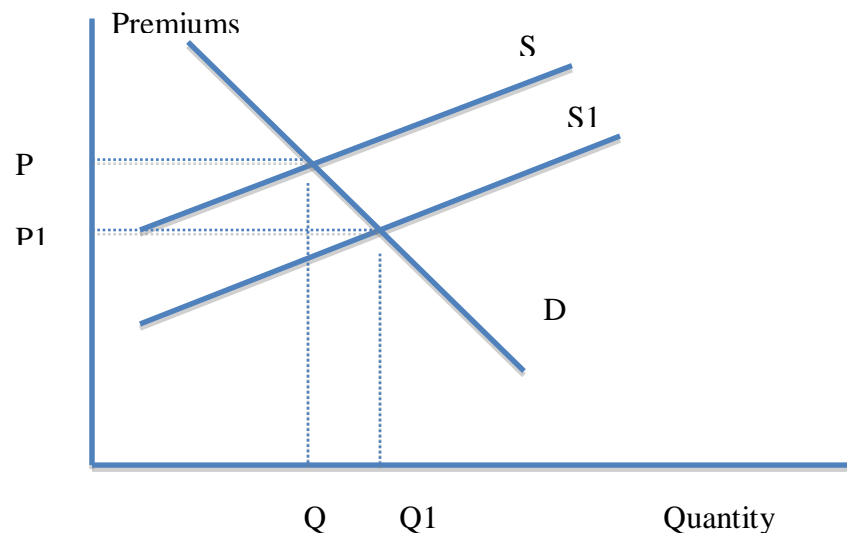
Necessarily of Governments' Involvement in Agricultural Insurance

As analyzed above, a huge source of benefits of the release of agricultural insurance program is profound. However, it has difficulty for commercial insurance market to develop this kind of insurance because of several its unique dilemmas without governments' involvement (see Agricultural insurance problems).

Moreover, the development of agricultural program could not completely rely on private sector. That is because of some form of market failures whereby private markets are not able to function to provide crop insurance in an efficient way (Goodwin 2001). In addition, in competitive market insurance, the equilibrium is where the indemnities and premiums are balance in the

long term. In agricultural insurance, insurers face both nature and market risks that require high premiums to cover indemnities when risk occurs (Zhang 2011). However, demand curve of agricultural insurance contains a source of producers with varying risk preferences. At higher insurance prices due to the increase of premium, only risk – averse producers are willing to purchase insurance and risk neutral and risk taking producers just participate in agricultural insurance at lower price (Hueth & Furtan 1994). Therefore, the expansion of agricultural supply curve requires the involvement of governments who operate the program and not charging administrative cost to the program or by not operating the program at an actuarially sound level (premiums charged are less than that charged by private loss ratio). As a result, the premium paid by farmers (P_1) is less than the market insurance rate of P . Participation then grows up from Q to Q_1

Figure 1: Insurance Market with Governments' Involvement



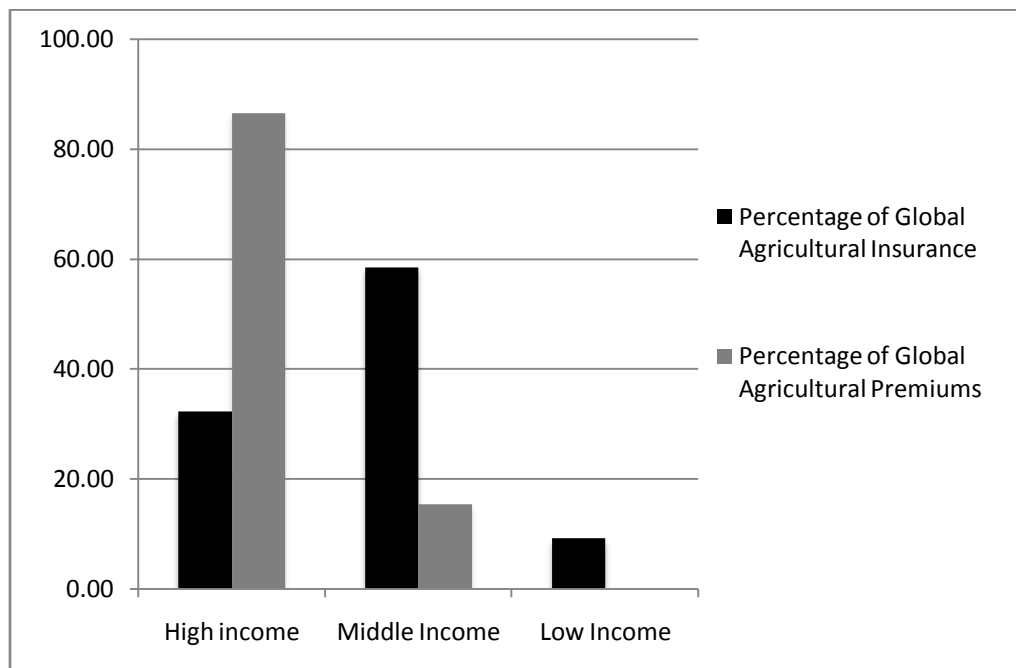
Source: Adapted from Hueth & Furtan (1994)

Furthermore, the difficulty in determining the intrinsic agricultural insurance prices (premiums) seems to be a barrier for private sector to operate agricultural insurance products. Reasonable premiums are extremely crucial in order to be attractive and affordable to farmers and financially viable and sustainable to insurers. The pricing process requires a long time series of high quality historical data related to risks such as agricultural, weather as well as market that could not be determined by private sector because of time and budget constraints. Therefore, the involvement of governments is necessary in order to guarantee the sustainable development of agricultural insurance.

The Development of Agricultural Insurance over the World

The development of agricultural insurance is mainly seen in high-income country. There were total 65 countries over the globe where agriculture insurance was conducted in which 59 of them are high and middle income. It can be clearly seen from the fig 2 – the development of agricultural insurance by countries based income status, in 2006, 86.5% of global agricultural insurance premium volume belonged to high income countries while they only accounts for 32% of global agricultural insurance. In contrast, an agricultural insurance premium in low income countries seems to be zero of the globes’.

Figure 2: The Development of Agricultural Insurance by Countries based on Income Status, 2006



Source: Adapted from World Bank survey 2006

The participation in agricultural insurance differs from country to country. In high income countries, agricultural insurance is provided based on the voluntarily, accounting for 80% (Mahul & Stutley 2010). In contrast, the participation in agricultural program is a precondition for accessing credit programs in lower-middle and low-income countries. This may be a positive manner to develop agricultural insurance in those countries.

Almost countries offering agricultural insurance, direct subsidies in premium seem to be the public intervention for agricultural policy. As a result of World Bank survey 2006, about 66% of countries in all income levels directly subsidise insurance premium, with subsidies paid

around 50% of gross premium. While, in some countries including Australia, Argentina and Germany no premium subsidies are offered in agricultural insurance programs

It can be seen from World Bank Survey that 50-300% of premium paid by farmers is from public expenses in almost all countries. In some high-income countries, the public support for premiums is higher than that in low and low middle income nations. For examples, the amount of money subsidized for premiums from governments in Italy and Spain is twice higher than premiums paid by farmers. In contrast, in low and low middle income nations, this amount is only about a half.

Premium subsidies may have a positive contribution to the development of agricultural insurance. This is because the reduction of insurance prices caused by premium subsidies would motivate farmers to purchase agricultural insurance. In Canada, 75% of farmers participate in crop insurance program because this country subsidizes 50% of crop insurance premiums and 100% of administrative expenses. In addition, according to Zheng et al. (2009), the success of agricultural insurance program of China who is the second largest agricultural market is based on the strong subsidies of insurance premiums

DISCUSSION

Through above in depth theoretical analysis and empirical evidences from the development of agricultural insurance programs over the world, the inevitable benefits can be clearly profound. However, how to sustainably develop agricultural insurance is much concerned. In opinion, the author of this report totally agree the necessarily of governments' involvement in agricultural insurance. However, the way governments involve in that in order to reach sustainable development should be revised.

As above discussed in the development of agricultural insurance program over the world, the empirical evidences indicate that the growth of agricultural insurance programs is based on a huge direct subsidies for premium. However, in opinion of this report's author, governments should not provide directly subsidized premiums in order to reach sustainable development of agricultural insurance due to some following reasons:

Firstly, subsidized premium is not likely the most important factor of the development of agricultural insurance. It is shown that the high level development of insurance is not only seen in countries with highly subsidized premium such as Canada, India and the United States of America but also in countries with traditionally agricultural insurance via unsubsidized premium such as Argentina, Germany and Australia (Mahul & Stutley 2010). Therefore, directly subsidies may not incentives for purchasing agricultural insurance.

Secondly, government direct subsidies for insurance premiums could result in market failures in insurance market. As analyzed above, in competitive insurance market, the premiums paid by farmers should equal to their expect losses in the future. However, in this case, because of government subsidies, premiums paid by farmers are less than that they should pay. As a consequence, producers are likely to be not aware to reduce risks during agricultural practices.

Thirdly, the concern about sustainable government budget should be raised. Direct subsidies are unsustainable for government's budget, especially for some countries whose GDP mainly distributed by agriculture sector because agricultural risks and GDP are correlated (Hazell & Hess 2010). Hence, the occurrence of agricultural production risks would have negative effect on GDP and government's budget.

Instead of direct subsidies for premiums, there are many effective manners that governments should invest in to reach sustainable growth of agricultural insurance.

Firstly, governments should invest in building modern infrastructure to record and provide a rich bank of weather and market data that requires huge initial investment that can be determined by private sector. That is because as discussed above, pricing process based on agriculture and weather data is very important for effective insurance market.

Secondly, enabling legal and regulatory system requires the government involvement. Legislation system should be sufficiently effective to enforcing contracts that both insured and insurers can trust. It is researched that the lack of effective law is a barrier for the development of agricultural insurance market. According to Zheng et al. (2009), although China is the second largest agricultural market in the world, it does not have insurance law.

Thirdly, investment in educational program becomes more effective. The reason is educated farmers would be more aware of value of insurance. It is more significant with countries where farmers lack insurance consciousness like China (argued by (Zhang 2011; Zheng, Zhang & Wang 2009)). In addition, the improvement on risk management skills can be the benefit of educational programs. Through those, farmers would be equipped skills and knowledge to better react the occurrence of risk. As a result, their crop yields and income might be guaranteed.

Finally, the change in subsidy manner should be considered. This is due to the fact that farmers are willing to pay the full premium without subsidies if it is linked to a value proposition that enables them to access credit and new productivity-enhancing technologies or high-value markets that can significantly raise incomes (Hazell & Hess 2010). On another way, subsidies should be paid directly to insurers to set off initial and development cost that helps to kick start insurance market because of high initial and development cost. It would result in less distortion caused by direct subsidies to premium paid by farmers.

CONCLUSION

Agricultural insurance play an important role in agricultural policies of each country over the world. That is because a huge numbers of benefits of agricultural insurance programs can be profound such as land use decision, environmental effectiveness as well as food security and farmer income stabilization. Therefore, governments are endeavoring to motivate the development of this insurance with different interventions from subsidizing to premium to un-subsidizing, from compulsory to access other public services to voluntary.

However, there are some difficulties in the development of agricultural insurance because of its unique dilemmas such as the absence of pooling, moral hazard as well as adverse selection. In addition, the development of agricultural insurance cannot be only rely on private sector because of some market failures that would occur and the difficulties in determining intrinsic premium. Hence, it requires the involvement of governments.

In order to reach sustainable development of agricultural insurance, governments should not subsidize directly to premiums paid by farmers. Instead of this, governments' investment should be in building modern infrastructure that can provide valued, accurate historical and forecasted data of weather and market; enhancing legal and regulatory system; providing educational programs to farmers and subsidizing to insurers to kick start insurance market.

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