

## The challenge of Food Security and the role of Micro-Insurance and locally-based Insurance Solutions for Emerging Countries

Until recently in the developed countries, food prices had been moving in one single direction – downwards – for almost a generation, while the prices of agricultural products had been falling for almost thirty consecutive years. 2008, however, saw a turnaround in the negative trend of food prices, with most crop prices on the global markets doubling in nominal terms and making newspaper headlines.



One of the main reasons for the increase in food and agricultural commodity prices lies in changes in dietary behavior in the emerging economies. While the demand for grain destined for human consumption is strongly correlated to population growth, the demand for meat is mostly tied to economic growth. As a result of economic success, increases in income in emerging markets such as China and India have led to a rapidly growing demand for meat in those countries, which in turn boosts the demand for cereals to feed livestock. For instance, average meat consumption in China has increased from 20 kg per capita in 1985 to 56 kg per capita in 2009 <sup>[1]</sup>. In light of this, it is easy to imagine the level of the pressure on grain supply on a global scale, since we know that producing one kilogram of pork takes 3.6 kilogram of grain, and that China and India together account for almost two fifths of the world's population. Furthermore, the huge surge in the demand for grain will increase even further in the near future, given that the world population is expected to reach 7 billion by late

2011 and 8.2 billion by 2025 according to United Nations predictions <sup>[2]</sup>.

Beyond the demand for grain linked to food production, there is an increasing demand in relation to energy production and biofuels. This could intensify concerns over insufficient grain supply for food, which in turn would inflate food prices. We should bear in mind that the amount of maize used to produce the ethanol needed to fill the tank of one car could provide enough food for one person for a whole year. Furthermore, grain supply is no less problematic than the demand for it. Due to desertification and urbanization, an area of mostly fertile arable land with the size of Italy or almost half of France is disappearing every seven years.

The imbalance of food supply and demand on a global scale, particularly in terms of major shortages and inflationary prices, could cause considerable social unrest in the emerging countries, as history has already shown. In order to offset ever-diminishing food production

resources and meet growing demand, the agricultural sector is using increasingly intensive production methods. In recent years it has become obvious that climate change and adverse weather events are jeopardizing stable, intensive agricultural production. As a result, many farmers are facing higher levels of production volatility, most probably caused by unfavorable climate change.

Consequently, above-mentioned factors led in countries all over the world to an increased awareness of the importance of a properly functioning agriculture industry. Furthermore, the need for securing food supply and consequently investments in new farming technologies at various stages (seed, fertilizer, machinery etc.) also require new risk management tools. Agriculture insurance in its various forms is one of these tools. SCOR Global P&C is one of the leading reinsurance players in the agriculture insurance and assumes an important role by providing expertise and capacity for new developments as described in more details in this paper.



## ► The role of insurance

Since in emerging countries most farmers possess small land plots, insurance solutions need to fit the real conditions of local farmers. So-called agricultural micro-insurance in particular could play a crucial role as an effective risk management tool in terms of reducing the production risks of small and low-income farmers and providing long-term sustainability, by stabilizing agricultural production, increasing food supply and stabilizing food prices. In light of the systemic risk involved, which is a common phenomenon for agricultural insurance, index-based insurance could become more appealing as an innovative risk management tool used to deal with spatially correlated risk. One of the purposes of recent developments in this field has been to incorporate the index-based concept into agricultural micro-insurance <sup>[3]</sup>.

Although the concept of agricultural micro-insurance seems to be popular, especially in terms of international

development policy, the application and marketability of this product requires a greater understanding of certain aspects:

- The prospect of insuring 1 to 3 billion rural people has attracted the commercial interest of private insurers, as well as governments and international organizations. While the basic interest of private insurers and reinsurers is to extend their customer base and diversify the risks associated with major lines of business, governmental and international organizations regard the insurance solution as a more efficient market mechanism by which to protect and supplement the public financial resources devoted to the coverage of rural social and economic risk, particularly catastrophic risk. From a government point of view, on the one hand insurance cover can fill the gap between actual losses and often very limited government financing, and on the other hand farmers can be compensated more quickly than they would be through government relief.

- The willingness of farmers to buy insurance also depends on several factors, which are involved in a long and complicated chain of risk transfer. The whole chain ensures that the risk is passed on from the farmer to the international markets and includes retailers, insurers, brokers, reinsurers, international organizations and national governments.
- In order to transfer the risk of agriculture production more effectively through insurance solutions, the needs of the local primary insureds, i.e. the farmers, must be thoroughly understood. In some cases traditional insurance seems to be the most appropriate and effective form, whereas in other cases alternative insurance products such as group cover or index-based cover prove to be more efficient. Ultimately, the successful development and implementation of such insurance policies require considering and accepting the most appropriate needs of the local farmers as well as the local primary insurers.

## ► Structure of risk sharing in the risk transfer process

The most effective structure for agricultural risk sharing and risk transfer involving both government and private participants comprises three layers (Figure 1):

- The first layer should target high frequency and low severity events with minor losses, which should remain within the deductible of the insured.
- The second layer of the diagram represents medium-frequency events with medium-level damage. Local insurers are often in a position of financial weakness compared to their international counterparts and are reluctant to invest in agricultural insurance products, as the impact of a systemic spatial event could have a devastating effect on their balance sheets. Therefore, it is necessary to look for mechanisms that would provide sufficient financial capacity to

cover the systemic risk involved. In this regard, the public sector could play a key role in facilitating the financial support process, e.g. for the start-up phase of cat risk transfer solutions, or in the implementation of pilot projects.

- The third and fourth layers show the insurance capacity for low to very low frequency events associated with high to catastrophic losses. This capacity can be created by building Public-Private Partnerships (PPP) alongside commercial reinsurance solutions. In PPPs, both private companies and governmental and international organizations share capital in order to provide financial capacity for risks that could be difficult to place and cover by national insurers alone. One example of this is the loss cap provided by the Korean

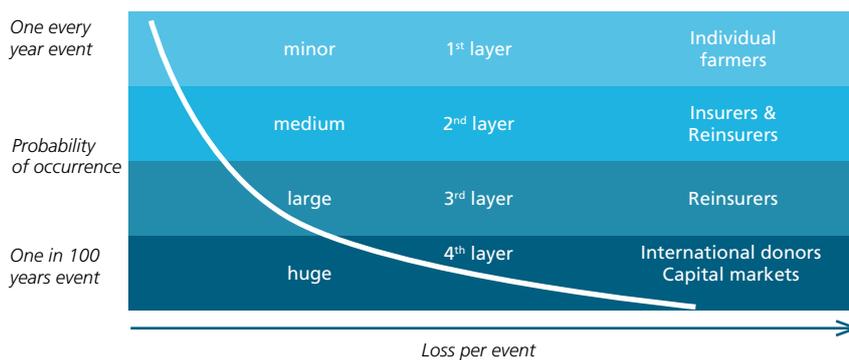
government to the agricultural insurance sector. If the risk of experiencing huge losses after a severe typhoon must be included when pricing insurance cover, the resulting insurance policies could prove unaffordable to farmers. Therefore the government takes the catastrophic part of the risk away from the market and the farmers are left to pay for the risk of smaller losses, which is lower and constitutes a wider spread of the insurance cover.

- International development agencies and research institutions can play a central role in terms of preparing the loss experience statistics (considered to be a "public good") used by the private sector in order to develop appropriate insurance products.

[3] Guy Carpenter. 2011. Guy Carpenter to Develop Agriculture Micro-insurance Market. Available at <http://www.gccapitalideas.com/2011/03/22/guy-carpenter-to-develop-agriculture-microinsurance-market/>



Figure 1. Share of production risk in terms of public-private partnerships



Because commercial insurers are reluctant to enter the agricultural insurance market where systemic risk is concerned, in the last couple of years some governments and international organizations have actively stepped in to provide coverage for all low-wealth farmers. For example, in 2009 the Government of Peru provided insurance cover for all farmers in high disaster-prone provinces.

If the yield of a particular province falls below the average level, the insurance cover is triggered and the regional government receives a lump sum to compensate farmers' losses.

The role of the reinsurance industry is manifold, but basically reinsurers should be the capacity providers and primary risk takers. There is a wide range of

agricultural business with which professional reinsurers can become involved. For instance, they can pass the experience of regions benefitting from efficient insurance facilities on to those regions where risk transfer tools have, until now, been unavailable, as well as regions where agricultural insurance exists but is still very much limited to major commercial farming companies and wealthy farmers.

International donor organizations have initiated and facilitated the development of efficient markets in many emerging countries. This support is quite effective, producing research and providing the mechanisms necessary for the participants to come together and discuss the issues at hand until they find an efficient solution. The donor role can also be found in education, providing financial support for public interest research and providing the data required for analysis.

## ➤ Index-based insurance as an innovative tool against systemic risk

An alternative and innovative option for covering systemic risk and catastrophic events, particularly in agriculture, is to use index-based insurance products. This sort of cover is also often referred to as parametric insurance. The most common examples of indices are temperature, precipitation and vegetation, measured at the selected reference weather stations or constructed using satellite remote sensing data.

In the last few years, index-based products have been widely piloted in many developing countries by development organizations like The World Bank, Food and Agriculture Organization, World Food Programme, etc. The experiences of these pilot projects show that index insurance can be used to cover systemic risks, e.g. drought in

agriculture (other examples include catastrophic risks such as floods, earthquakes and typhoons in property). The most common ultimate beneficiaries of index insurance in the agricultural sector are large agricultural producers, banks (see India) and regional or national governments. The key feature of index insurance cover is that the payout is not conditional on local loss adjustment, but depends on the correlation between the yield losses and the underlying index. The main advantage of using index cover is that once the index has been calibrated and accurately reflects the actual losses in the fields, the whole process of underwriting and claims adjustment is rendered unnecessary and problems with moral hazard, adverse selection and outright fraud are instantly eliminated.

The main drawback of index insurance can be found in the basis risk, i.e. the risk that the index value does not fully correspond to the losses sustained in the fields. One possible consequence of this is that the farmer is not compensated for losses. This problem is serious and should not be neglected insofar as the farmer's feelings of injustice could discredit the reputation of an agricultural insurer as well as the entire concept of index-based insurance products. In order to reduce the basis risk as well as reduce operating costs, the underlying index should be closely related to the losses sustained in the fields. In addition, index-based insurance product is more efficient when insuring a large homogeneous production region that includes entire groups of farmers.



Regarding systemic risk, which often rises due to extreme weather events, weather-index market could offer a broad business opportunities to reinsurers, where they could provide necessary capacity. Recently, reinsurers have been showing an interest in index insurance products and are actively developing such solutions. One of the most successful examples of such cover in agriculture can be observed in Mexico, where the government has authorized an agricultural reinsurance company to develop parametric insurance for all

farmers in a defined region. Because the most significant risk in this region is drought, a minimum level of rainfall is considered necessary in order to grow crops. If the rainfall is below this trigger point, the insurance cover is activated and a payout will follow. Because the crops are prone to rainfall deficit to varying degrees throughout their growing season, the amount of rainfall is measured during three separate vegetative periods, namely during the growth period, the flowering period, and the grain filling period.

Despite the high popularity of index-based insurance, the premium volume in relation to the global production is still low. One additional difficulty faced by parametric insurance relates to the regulatory issues present in many countries. In order to prevent speculation, insurance regulators in some countries have outlawed the marketing of parametric insurance.

## ► Concept and examples of micro-insurance in agriculture

In many cases governments are interested and also directly involved in the development of the agricultural insurance market. Since most rural people in emerging countries are farmers operating small plots, the insurance used to cover their risks is commonly known as “micro-insurance”. Micro-insurance has been defined by the International Association of Insurance Supervisors as “...insurance that is accessed by a low-income population, provided by a variety of different entities, but run in accordance with generally accepted insurance practices...”<sup>[4]</sup>. Governments in many countries often cannot find a better alternative to supporting agricultural micro-insurance products. In many countries, the future of micro-insurance in the agricultural sector is not clearly defined at all. It comprises a broad range of programs with different organizations, including

non-governmental organizations, private or development banks, and national or regional governments.

A major difference between micro-insurance and standard insurance is that the premiums for micro-insurance, calculated per individual, are very low. Therefore, micro-insurance can only effectively work if operating costs are kept down and if at the same time the number of individuals insured is high. These constraints mean that traditional insurers need to develop new ways of thinking in terms of business operations. The key to success in this field is the way in which micro-insurance is sold and distributed. This process requires efficient and low-cost distribution channels, which could be better managed through a local organization rather than through direct contact between the primary insurer and the individual farmer. There are cases in which local organizations are able

to group farmers together, which gives them a crucial role from the primary insurer’s point of view. The size of these farmers’ groups may vary widely, ranging from a handful of farmers in a small community to a group that includes all of the farmers in an entire province or state. The players in the micro-insurance market are not the same as those in the traditional insurance market, and their numbers may be extended to include mutual insurers and cooperatives by using a formal or informal risk sharing mechanism.

Due to the particular conditions present in agriculture, it is crucial to develop different business models in accordance with local situations. Most market players are still reluctant to bring insurance services to low-income groups in emerging countries. The programs listed in the table below are some examples of existing agricultural micro-insurance models.

Table 1. Micro-insurance models for agriculture

Business model	Characteristics	Example in agriculture
Direct	Insurer uses own distribution channels	Non-existent or at least unknown
NGO	Cooperation between NGO and Insurer	Vineyard growers in Tarija, Bolivia
Mutual without regulation	Local communities, member-based organizations	Sociedad Rural Rio IV, Argentina
Mutual with regulation		Fondos de Aseguramiento in Mexico
Bancassurance	Insurance linked to credit	Panama, Philippines, Honduras, India
Public-Private Partnership	Government buys cat cover	Peru, Province of Mendoza Argentina
International Development Agency	International agency buys cat cover	Ethiopia

[4] Chatterjee, A. 2007. *The Legal and Regulatory Framework oriented towards Microinsurance Development*. Paper presented at the Meeting of the International Association of Insurance Supervisors, 6 September 2007.



In practice, micro-insurance could be also regarded as being synonymous with community-based financing arrangements. Most community financing schemes have evolved in the face of considerable economic constraints and political instability. Under these circumstances, micro-insurance could incorporate mutual arrangements into its policies in order to facilitate risk sharing among farmers. Examples of such mutual insurance exist in several countries with a mostly subtropical climate, such as Argentina, Mexico, South Africa and Australia. The risk insured through mutual arrangements in each of these countries is hail, which meets the main criteria of an insurable peril – i.e. that the risk is independent, distributed and unpredictable. All plots in the given area have the same probability of hail damage, which can be easily verified. Moreover, because hail is usually a local event and not a systemic risk, the spatial diversification effect will be very significant if the insured area is large enough.

Farmers exposed to hail risk have in many cases created self-insurance associations, which can be regarded as an early form of micro-insurance community, and in some cases these have developed into formal mutual insurance companies.

In Mexico for example, mutual groups initially operated without governmental regulation and resembled self-insurance associations protecting themselves from common weather risks. The government realized that this sort of mutual group is effective in terms of assessing losses because the assessment is conducted by the mutual groups themselves, and the local communities are involved in the major phases of the transaction process, which in turn keeps the transaction costs down. To support these organizations, the federal government decided to provide them with the requisite legal framework. As the agricultural insurance business of mutual groups (or *Fondos*, as they are called in Mexico) has expanded in volume

and geographical scope, the government has provided the appropriate reinsurance support. This has meant that the *Fondos* are able to include new perils, even spatially correlated risks such as drought, frost and heavy rain, which pose a considerable threat to the existence of the *Fondos* in the long-term.

Experience in different countries shows that each country follows its own strategy in terms of the regulation and development of micro-insurance programs. In some countries, agricultural micro-insurance is regulated by the insurance supervisory authorities, whereas in other countries it is supervised by the Ministry of Agriculture. The factors affecting the development path of micro-insurance in agriculture will be defined by the rate of economic growth, by increased demand for higher quality food, by climate change-induced extreme weather events, and by the willingness of the insurance industry to move in this direction as well as its capacity for innovation.

## ➤ Agricultural micro-insurance in practical business

In current micro-insurance markets, the most common products are related to rural life insurance. Life micro-insurance is more suitable for a mass market than pure agricultural micro-insurance due to its low cost. Compared to agricultural micro-insurance, the cost of verifying claims is relatively low, since it requires no specialist training.

From the viewpoint of a commercial insurer, it is difficult to find a balance between providing farmers with the appropriate insurance at very low premiums, and protecting the company's own economic interests. Moreover, even if the costs for contract wording must be kept as low as possible, micro-insurance contracts should include institutional and legal protection for the insured, thereby providing the trust and stability needed to establish

micro-insurance on the local market on a long-term basis. Even though some micro-insurance pilot projects are not purely profit-oriented and try to reach a compromise between profitable business and low premiums, it is still too early to say whether or not the development of micro-insurance will be sustainable and successful.

In most of the countries involved, there are no special regulations for micro-insurance and its related issues, which means that neither the solvency of the insurer nor the protection of the insured is regulated. As of January 2011 only three countries – India, Peru, and South Africa – have explicit micro-insurance legislation in place. The Philippines has legislation for Mutual Benefit Associations (MBAs), which provide some products specifically to the low-income market.

Most of the differences between traditional and micro-insurance contracts, however, lie in the way in which the original insurance policy is sold and worded. In micro-insurance contracts, expectations relating to information are severely limited. For example, a micro-insurance contract can be accepted even if the seller of the policy does not fully understand all of the insurance, legal and regulatory issues involved, or if the original policy is severely limited in terms of the agreement of exclusions and conditions. In general, the simplified contract form is useful in order to render the cover acceptable. Furthermore, in order to be readily accepted by the insurance market, micro-insurance cover needs a sufficient payoff. Lastly, the phrasing of the policy must be understandable to the originally insured and to all parties involved.

In order to fulfill the above-mentioned conditions, a form of group policy at a local level seems to be more appropriate to micro-insurance. Group policies facilitate the involvement of the local farmers in the adjustment process. Several case studies have shown that the loss adjustment process moves much faster if the farmers in the group conduct the loss adjustment themselves, and that the cost will be much lower if local adjusters are also involved. Furthermore, the involvement of farmers in loss adjustment could simplify the whole documentation

procedure considerably. In concrete terms, the same person can, at a local level, be authorized to handle claims and manage the distribution channel. Nevertheless, there are disadvantages to this model. For example, a conflict of interest could occur, with the seller of the original policy accepts unjustified losses in order to retain clients and ensure that they renew their policy for the next season. Due to the slack regulation of micro-insurance, e.g. lower burdens on compliance, as well as the relatively high costs relating to claims settlement and

business operations, it will be a challenging task to keep micro-insurance premiums at a reasonably low level.

Governmental involvement would be more market-oriented and efficient, if governments tried to motivate and help current or new insurers to enter the micro-insurance market within a regulatory framework. Generally speaking, there are large numbers of informal schemes. In many cases, governments operating at a community level already provide a service that can be seen as insurance cover.

## ► Summary and outlook

Micro-insurance is currently attracting the attention of commercial insurers and development agencies, and is trying to become an efficient and innovative risk management tool to meet the demands of most farmers in low-income countries. To sum up, some points on the greater acceptance and market potential of micro-insurance products should be addressed.

- Because each country has its own particular client group and circumstances, the contract form should be kept as simple as possible and should deliver tailor-made solutions for each particular case.
- In order to increase the demand for micro-insurance, farmers in the micro-insurance program can be encouraged to participate through direct support in the form of government subsidies

or tax reductions, or through indirect support in the form of training, education and promotion.

- Almost as important is the idea of building confidence in the agricultural insurance sector by strengthening coordination among policy makers. Experience in the field has shown that inefficient and unsatisfactory coordination between several organizations, each with different and often contradictory interests, could create considerable confusion in the markets, which hampers the development of micro-insurance projects. Therefore it is important to clarify the roles of the various agents involved and to find a consensus among the authorities and agents in order to implement micro-insurance successfully.

- The establishment of efficient regulatory policies seems to be crucial for the marketability of micro-insurance products, since regulation that is either too strong or too weak can hamper the sustainable development of micro-insurance. On the one hand, overly strict regulation could have negative and unexpected consequences for development, while overly lax regulation could lead to potential defaults in loss payments.
- With regard to moral hazard and systemic risk, weather-index-based insurance as an innovative solution can be adapted to the concept of micro-insurance.

## SCOR Global P&C Agriculture Unit

### SCOR Global P&C

1, avenue du Général De Gaulle - 92074 Paris La Défense Cedex France

Editor: **Dominique Dionnet**

Tel.: + 33 (0)1 46 98 74 00 - Fax: + 33 (0)1 46 98 84 49 - [ddionnet@scor.com](mailto:ddionnet@scor.com)

ISSN: 1967-2136

No part of this publication may be reproduced in any form without the prior permission of the publisher.

Design and conception: SCOR Global P&C, Strategy & Development/ sequoia - (07/2011).