



# Effectiveness of Insurance

**For Disaster Risk Reduction and Climate  
Change Adaptation:**

## Challenges and Opportunities

**Institute for Global Environmental Strategies  
Hayama, Japan**



# Effectiveness of Insurance for Disaster Risk Reduction and Climate Change Adaptation: Challenges and Opportunities

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# Foreword

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The Asia-Pacific region is one of the most vulnerable regions to climate change impacts because millions of people in the region dwell in rural areas, are poor households and are dependent on agriculture and related sectors for their livelihoods. Addressing climate change impacts for these communities requires moving away from business-as-usual practices towards practices that have high net positive benefits in terms of disaster risk reduction (DRR) and climate change adaptation (CCA). Risk insurance has been advocated as a practice that has high potential to provide these benefits. However, the current insurance approaches are not achieving their expected potential due to a variety of factors that are embedded in the traditional notions of risk spreading, institutional imperfections and lack of innovation. The reported insurance benefits are largely hypothetical and there is a dearth of evidence for insurance benefits from actual community-based insurance initiatives. Measuring the DRR and CCA costs and benefits of various forms of insurance can help in identifying the most effective insurance approach and help put insurance among the basket of risk mitigation options suitable to the most vulnerable and ultra-poor people.

Recognizing the above need, the Asia-Pacific Network for Global Change Research (APN) is funding the project ‘Assessing Community Risk Insurance Initiatives and Identifying Enabling Policy and Institutional Factors for Maximizing Climate Change Adaptation and Disaster Risk Reduction Benefits of Risk Insurance,’ which has the objectives of identifying technical, socio-economic, institutional and policy barriers limiting the penetration of risk insurance, to assess CCA and DRR benefits and costs accrued through risk insurance initiatives and to identify an enabling environment to scale up risk insurance. This report is a first step in meeting these objectives. I believe that this report will raise awareness of the need to evaluate insurance interventions in terms of CCA and DRR outcomes and stimulate discussion and research to address insurance effectiveness and outreach to the most vulnerable groups.

**Linda Anne Stevenson, PhD.**

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# Preface

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Climate change has brought a new dimension to human development. Stakeholders across the broad spectrum of development are having to address climate change concerns in their developmental efforts. The assumed benefits provided by insurance to the management of both climatic and non-climatic risks have attracted climate change adaptation (CCA) and disaster risk reduction (DRR) practitioners to consider it as an important risk management tool. Despite the efforts by various stakeholders, the communities whose livelihoods are most vulnerable to climatic vagaries have often not been reached by insurance. Several bottlenecks remain unaddressed, such as the high cost of insurance relative to ability to pay, poor overall progress on risk mitigation, lack of awareness among the communities of risk insurance, and lack of an enabling policy environment, etc. From a deeper perspective, there is a lack of robust evidence as to what CCA and DRR benefits accrue from risk insurance and how they compare with other risk management opportunities that exist or can be developed as an alternative to risk insurance.

With this background, the research team comprising of the Institute for Global Environmental Strategies (IGES), Hayama, Japan; Southeast Asia Disaster Prevention Research Initiative (SEADPRI) of Universiti Kebangsaan Malaysia (UKM), Bangi, Malaysia; eeMausam, Weather Risk Management Solutions, Hyderabad, India; International Agriculture for Development (IAFD), Brighton, Adelaide, Australia and University of Philippines at Los Baños (UPLB), Laguna, Philippines embarked upon the project ‘Assessing Community Risk Insurance Initiatives and Identifying Enabling Policy and Institutional Factors for Maximizing Climate Change Adaptation and Disaster Risk Reduction Benefits of Risk Insurance’ with the objectives of identifying technical, socio-economic, institutional and policy barriers limiting the penetration of risk insurance, to assess CCA and DRR benefits and costs accrued through risk insurance initiatives and to identify an enabling environment to scale up risk insurance. Funded by the Asia-Pacific Network for Global Change Research (APN), the team organized a regional consultation workshop on 4-5 July 2014 at Bangi, Malaysia to discuss issues pertinent to identifying and measuring DRR and CCA benefits of risk insurance. This research report was developed as an outcome of the workshop to reflect the current level of understanding on this subject. The authors thankfully acknowledge the helpful inputs received from the research and development experts representing government and non-governmental organizations during the consultation meeting and to various reviewers specified in the List of Contributors.

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# Acronyms

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AMR	Agriculture Mutual Relief Association
APN	Asia-Pacific Network for Global Change Research
ATI	Agriculture Training Institute
AWS	Automatic Weather Stations
BAAC	Bank for Agriculture and Agricultural Cooperatives
BAU	Business as usual
BFAR	Bureau of Fisheries and Aquatic Resources
CCA	Climate change adaptation
CCEs	Crop cutting experiments
CCIS	Comprehensive Crop Insurance Scheme
CPBRD	Congressional Policy and Budget Research Department
CRED	Center for Research on the Epidemiology of Disasters
DRR	Disaster risk reduction
EM-DAT	The Emergency Events Database
FAO	Food and Agriculture Organization of the United Nations
GFDRR	Global Facility for Disaster Reduction and Recovery
IPCC	Intergovernmental Panel on Climate Change
LGUs	Local Government Units
MBA	Mutual Benefit Associations
MFI	Microfinance Institution
MNAIS	Modified National Agricultural Insurance Scheme
NGO	Nongovernmental Organization
NOSAI	<i>Nōgyō Kyōsai</i> (English: Agriculture Mutual Aid)
PACE	Product, Access, Cost and Experience
PCA	Philippine Coconut Authority
PCC	Philippine Carabao Center
PCIC	Philippine Crop Insurance Corporation
PKSF	Palli Karma-Sahayak Foundation
PPP	Public Private Partnership
SD	Sustainable development
UN	United Nations
WBCIS	Weather Based Crop Insurance Scheme



# Executive Summary

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Agrarian and poor communities in general in the Asia-Pacific region are highly vulnerable to climate change. Effective reduction of vulnerabilities requires aligning sustainable development (SD), climate change adaptation (CCA) and disaster risk reduction (DRR) initiatives. Insurance has been increasingly advocated as a risk management tool both by the CCA and DRR communities. However, to what extent insurance has been able to provide risk management benefits is not clearly evident from available experience. The discussion in this report shows that the uptake and effectiveness of insurance is low in the agricultural sector and amongst the most vulnerable groups. Major barriers exist, and while ways to overcome these can be suggested, the limits of insurance must also be recognized. Insurance does not prevent the occurrence of losses, but it does have the potential to benefit DRR and CCA if the current barriers are adequately addressed. Each country and each region within countries have unique risk and vulnerability contexts and thus the design of insurance services must be context specific and targeted to specific vulnerable communities. Keeping in view the importance of agriculture in the livelihoods of Asian communities, this report mostly delves into the experiences emanating from agriculture insurance, though lessons from other forms of insurance has also been drawn wherever relevant.

There is a lack of clear assessment and recognition of insurance benefits and costs in terms of DRR, CCA and SD in existing research. Specifically, there is no evidence to suggest that the current form of insurance provides long-term risk reduction. To the contrary, the ways the insurance programs are designed and implemented today do not provide the full potential benefits that risk insurance offers.

For insurance to provide DRR and CCA benefits, there is a need for the insurance industry to first address the traditional issues that are hindering its effectiveness. From the discussion in this report, it is evident that the traditional insurance programs impose a huge financial burden on the insured because of administrative costs, and unresolved adverse selection and moral hazard problems. Administrative and legislative remedies are necessary to address some of these problems. Another challenge is for the insurer to have an adequate financial base. This report suggests fast-tracking pilot testing of index insurance programs, promoting

greater access to international reinsurance markets and promoting targeted government-supported insurance programs for the poorest people who cannot otherwise afford insurance.

The effectiveness of insurance to risk management varies between developed and developing countries. From the studies presented in this report, it is evident that the crop insurance market environment is customer friendly in developed markets like Australia and Japan, while many issues seem to limit crop insurance penetration in the developing markets such as India and the Philippines. The studies in the developing markets indicate that farmers' awareness of insurance is quite low, particularly in India; they even are not aware about their own insurance coverage and claim settlement as the claims are directly settled by the banks that provided the crop loans to the farmers. These findings suggest that a piecemeal approach to solving the issues that are hindering the functioning of crop insurance programs will not work; rather, all the important issues and impediments need to be resolved through policy interventions and well-coordinated efforts from all the key stakeholders.

After addressing common insurance issues, the national level policy environment need to focus on product innovation, compulsory and multiple year coverage, development and sharing of comprehensive databases and capacity enhancement of loss adjusters, among other issues facing rural insurance in developing countries in the region. In terms of the agrarian community, more needs to be done to enhance awareness and effect change in behavior and movement towards a proactive collective risk management approach. CCA and DRR benefits can be generated even by taking new approaches to drawing up insurance contracts. For example, insurance contracts could specify payouts to be made to female household members, which could in turn increase the role of women in household risk management decisions. Insurance could be designed in such a way that it is mandatorily combined with on-farm risk mitigation practices and conveys proper price indications to those who implement risk mitigation practices.

The report examines the available methodologies and indicators to assess the effectiveness of risk insurance. The major limitations to effectiveness measurement methodologies are a lack of a uniform set of indicators to measure insurance outcomes, which makes cross comparison between different studies and insurance products nearly impossible, and lack of a clear definition of expected insurance outcomes for CCA and DRR. The dearth of literature quantifying real benefits and costs of insurance is associated with the complexity of connections between CCA, DRR and SD, the complex ways in which stakeholders are impacted by insurance, and limited understanding on the CCA, DRR and SD concepts among the related professionals.

Insurance premium costs or affordability has emerged as an important issue regarding outreach to the most vulnerable and poor households. NGO-MFIs and other developmental NGOs with a strong presence in rural communities that are willing to experiment with product design and delivery may be the most effective conduits for insurance to poor farming

households. To take on this role, they will first need to invest in generating local data and building information systems and the technical capacity of staff to handle insurance. They will also need to experiment with the losses covered, payout arrangements and triggers, packaging of insurance with other products, as well as with delivery models.

Engaging appropriate stakeholders and building their capacity in insurance delivery is an important aspect of ensuring insurance effectiveness. The report has identified that there could be different means of delivering insurance to different sections of the society. Most importantly, the report indicated that public-private partnerships form an important means of insurance delivery and capacity building of the stakeholders engaged. For reaching the poorest communities in the rural areas, NGOs could provide an effective means of delivering insurance services and can strengthen the community-based insurance approaches.

Governments must play the role of an enabler through appropriate policies and as a regulator by putting in place proper monitoring and evaluation procedures that encourage movement beyond the notions of traditional insurance effectiveness towards considering the adaptation and disaster risk reduction benefits of insurance.

# Chapter 1

# Background

---

**Sivapuram V.R.K. Prabhakar**

## 1.1 Hazard and Vulnerability Context

The Asia-Pacific region is one of the most vulnerable regions to a range of primary hydro-meteorological and geological natural hazards such as earthquakes, storms, floods, tsunamis, landslides, and droughts. The Emergency Events Database (EM-DAT) of the Center for Research on the Epidemiology of Disasters (CRED) suggests that the number of hydro-meteorological disasters during 2000-2009 was 10 times more than the number of disasters reported during 1947-1956. In the Asia-Pacific region, hydro-meteorological disasters claimed the lives of 0.22 million people with estimated total economic damage costs of US\$ 285 million during 2001 – 2012 (Prabhakar et al., 2013). An increase in the number of catastrophic disasters and related insured and uninsured losses has been reported. These disasters are undermining the developmental gains across the Asia-Pacific region and indeed the world.

The region's relatively high vulnerability to natural hazards is due to a range of geophysical, socioeconomic and developmental conditions, which include long coastlines, a highly variable monsoon system, high volcanic and tectonic activity, high poverty both within and outside of urban areas, high population densities associated with rapid urbanization, poorly planned urban development, absence of proper disaster risk reduction (DRR) mechanisms and institutional/regulatory frameworks including the existence and enforcement of structural standards such as building and land-use planning regulations, as well as the poor development of risk spreading instruments such as insurance.

## 1.2 Insurance for Managing Risks

In this context of high vulnerability, insurance has been suggested as an important risk management tool at all levels as it: a) promotes emphasis on risk mitigation compared to the



current response-driven mechanisms, b) provides a cost-effective way of coping with the financial impacts of climate- and weather-induced hazards, c) supports climate change adaptation (CCA) by covering the residual risks which are not covered by other risk reduction mechanisms such as building regulations, land-use planning and disaster risk management plans, d) stabilizes rural incomes and hence reduces adverse effects of negative shocks on income and socio-economic development, e) provides opportunities for public-private partnerships, f) reduces the burden on government resources for post-disaster relief and reconstruction, g) helps communities and individuals to quickly renew and restore their livelihood activity, and h) addresses a wide variety of risks emanating from climatic and non-climatic origin, depending on the way the insurance products are designed (Prabhakar et al., 2013).

Both life and non-life insurance play an important role in DRR. However, life insurance is more prevalent than non-life insurance in terms of the volume of insurance premiums, and this is especially so in the formal sector. In terms of climate change, among all the forms of insurance, insurance that covers the loss of livelihoods (e.g. agriculture insurance) is amongst the most important, yet its issuance is limited in the region. Though there are several policy and institutional initiatives to promote insurance in the Asia-Pacific region, the region has not been able to utilize the full potential of insurance. The problems facing insurance include poor internalization of insurance benefits, high insurance costs, poor access and availability of weather data, poor risk mitigation, lack of enabling policies, imperfect information, and technical complexity. A deeper problem is the lack of clear assessment and understanding of insurance benefits and costs in terms of DRR, CCA and SD among the stakeholders engaged in insurance policy making and delivery.

## **1.3 Organization of the Report**

This report is an outcome of an expert consultation workshop ‘Evidence for Disaster Risk Reduction and Climate Change Adaptation Effectiveness of Insurance: Challenges and Opportunities’, 4-5 July 2014, Bangi, Malaysia, jointly organized by Institute for Global Environmental Strategies (IGES), Hayama, Japan; Southeast Asia Disaster Prevention Research Initiative (SEADPRI) of Universiti Kebangsaan Malaysia (UKM), Bangi, Malaysia; eeMausam, Weather Risk Management Solutions, Hyderabad, India; International Agriculture for Development (IAFD), Brighton, Adelaide, Australia and University of the Philippines at Los Baños (UPLB), Laguna, Philippines as a part of an ongoing project on Assessing Community Risk Insurance Initiatives and Identifying Enabling Policy and Institutional Factors for Maximizing Climate Change Adaptation and Disaster Risk Reduction Benefits of Risk Insurance. The report also draws on stakeholder perception surveys conducted in Australia and Japan, and on a literature review.

Based on the problems insurance is facing that are outlined above, the objectives of the project are to identify technical, socio-economic, institutional and policy barriers limiting the penetration of risk insurance, to assess CCA and DRR benefits and costs accrued through risk insurance initiatives and to identify the important elements of an enabling environment to scale up risk insurance. As an early activity of the project, the workshop aimed to gain a deeper understanding of the issues plaguing the spread of insurance. It highlighted the fact that there is very limited evidence on how various forms of insurance are helping communities in addressing climate change and variability related issues. This lack of evidence hinders a clear understanding of the benefits and costs of insurance, which in turn makes it difficult for different stakeholders to maximize the potential benefits of insurance as an instrument for risk management. The workshop discussed issues associated with the spread of insurance, the effectiveness of the ongoing efforts by different governments, insurance companies and NGOs, how different stakeholders approach the issue of insurance effectiveness, and what indicators can help quantify effectiveness. The findings presented in the report are based on the discussions during the workshop, research work carried out by the study partners (e.g. Australia and Japan) and literature review.

Chapter 1 of this report provides the necessary background for the subsequent chapters. It describes the hazard and vulnerability context of the Asia-Pacific region and introduces insurance as a risk management tool. Chapter 2 describes current understanding on the issue of insurance effectiveness, discusses the traditional notion of insurance effectiveness and how it is not sufficient to evaluate the DRR and CCA benefits of insurance, and what changes are required in thinking on this matter. Chapter 3 discusses a number of studies reporting insurance effectiveness and lists indicators that map costs and benefits. Chapter 4 describes various bottlenecks to risk insurance associated with moral hazard, adverse selection, insurance costs, penetration rate, policy environment and affordability, and provides suggestions to overcome these limitations. Chapter 5 goes deeper into specific country experiences of implementing insurance initiatives. Chapter 6 documents selected non-governmental interventions in the field of risk insurance and distills specific indicators that could be used for evaluating the effectiveness of insurance programs. The Executive Summary summarizes the key messages from these chapters. Based on these results, the project team aims to conduct case study analyses quantifying the DRR and CCA benefits of risk insurance in the subsequent years of the project.

## 1.4 References

Prabhakar, S.V.R.K., G. S. Rao, K. Fukuda, and S. Hayashi. 2013. Promoting risk insurance in the Asia-Pacific region: Lessons from the ground for the future climate region under UNFCCC. In: P. Schmidt-Thome and J. Knieling (Eds.), *Implementing Climate Change Adaptation Strategies*. UK, London: Blackwell Publishers, pp 327.

## Chapter 2

# Insurance for Disaster Risk Reduction and Climate Change Adaptation – An Overview

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**Sivapuram V.R.K. Prabhakar, Arpah Abu-Bakar, Sobiah Becker, Joy J. Pereira and Divya S. Solomon**

## 2.1 Introduction

Insurance has been proposed as a cost-effective way of coping with the financial impacts of climate change. Depending on the way the insurance is designed, the insurance mechanism can address a wide variety of risks emanating from climatic and non-climatic sources. The evidence indicates that there are many advantages of insurance (Siamwalla and Valdes, 1986; Arnold, 2008; Swiss Re, 2010). These include the shift in emphasis from risk mitigation to response, coverage of residual risks uncovered by the other risk mitigation mechanisms and stabilization of rural incomes by reducing the adverse effects of income fluctuation.

Insurance also provides opportunities for public-private partnerships and reduces the burden on government resources for post-disaster relief and reconstruction. Communities and individuals can also quickly renew and restore livelihood activities through the use of insurance.

About 58% of the population in Asia lives in rural areas and of this 81% are dependent on agriculture for their livelihoods (Hijioka et al., 2014). Many rural households are poor – South Asia has the highest number of rural poor people in the world – and these households

are highly vulnerable to climatic shocks as their livelihoods are directly impacted by the weather and climate. In parts of Asia rural poverty has declined, but these gains are now threatened by the adverse impacts of climate change. While it is evident that agrarian communities are amongst those most vulnerable to climate change and in need of risk management mechanisms, the penetration of risk insurance into rural areas, and most importantly into the most remote and economically disadvantaged areas, is still very insignificant (Food and Agriculture Organization of the United Nations, 2011). Though the insurance premiums in the agriculture sector in the Asia-Pacific region have doubled in recent years, the total value of premiums in the region is less than 20% of the total global value (Food and Agriculture Organization of the United Nations, 2011). Even in areas where insurance is available, the effectiveness of the current insurance products in terms of disaster risk reduction (DRR) and climate change adaptation (CCA) appears to be quite limited.

It has been argued that risk insurance has potential to promote DRR and CCA, and thereby contribute to SD (Warner et al., 2009; Arnold, 2008). However, whether insurance actually has offered these benefits to the subscribers is not clear. This chapter explores the concept of insurance effectiveness in terms of CCA and DRR impacts. The chapter clarifies the similarities and differences between CCA and DRR so that the reader can clearly see how insurance benefits can be assessed from these perspectives. Subsequently, it discusses insurance effectiveness in the traditional sense and the need to change the criteria used to evaluate effectiveness, provides a brief overview of risk exposures associated with insurable risks in the agriculture sector, and discusses barriers to insurance within the agrarian community and possible interventions to overcome them. This is followed by a cursory review of the potential for insurance to reach the most vulnerable and very poor households in rural areas. The chapter concludes with brief remarks on the potential of insurance to benefit agrarian communities including the most vulnerable households for long-term DRR and CCA outcomes.

## **2.2 Similarities and Differences Between CCA and DRR**

Before delving into the notion of insurance effectiveness, it is essential that the reader understands the synergies and differences between CCA and DRR, and their relationship with sustainable development (SD). CCA and SD are complementary fields. In order for climate change adaptation interventions to be successfully implemented, it is now widely understood that they should be included as part of SD programs. Also, it is injudicious to implement future SD programs without taking CCA and DRR into consideration (IPCC, 2007; Rayner and Malone, 1998). Despite these understandings, little has been done to incorporate DRR and CCA within development programs especially in developing countries (Berke, 1995; Burton and Van Aalst, 1999).

Adaptation is most often regarded as a technical issue rather than a process of change to a new socio-ecological state. The Intergovernmental Panel on Climate Change (IPCC) defines adaptation as ‘adjustments in ecological, social, or economic systems in response to actual or expected climatic stimuli and their effects or impacts. It refers to changes in processes, practices, and structures to moderate potential damages or to benefit from opportunities associated with climate change’ (IPCC, 2007). Disaster risk reduction has been described as ‘the process of reducing exposure, lessening underlying vulnerabilities, better management of resources and improved preparedness towards future hazards’ (Setiyadi et al., 2010) and is clearly relevant to CCA. From these definitions, it can be seen that both CCA and DRR address the underlying causes of vulnerability to a hazard or risk. In addition to shocks, climate change also addresses the need for long-term adjustment to slow onset changes.

Various authors have theorized different understandings of these concepts; the theoretical concepts of CCA and DRR are often semantic and ambiguous leading to a variety of understandings regarding the linkages between CCA and DRR. This partly explains why DRR, CCA and SD have largely developed as separate fields. However, as the effects and causes of climate change are more thoroughly explored in scientific studies, understanding of the intricate linkages between these fields has grown. CCA and DRR are cross cutting fields that to be efficiently managed must be incorporated into SD strategies at all levels. Climate change has added additional complexity to the nexus between DRR and SD (International Organization for Migration, 2009). Often, measures adopted for CCA are aligned with those used in the DRR field. The key difference between these two approaches is that in the case of DRR historic data is analyzed, whereas for CCA more emphasis is placed on future predictions (Economic and Social Commission for Asia and the Pacific Committee on Disaster Risk Reduction, 2013).

SD requires analysis of socio economic, political and demographic issues as underlying causes of vulnerability; these issues are also fundamental to adaptive capacity. SD thus reduces vulnerability, and as a result, resilience and adaptive capacity are strengthened through SD (for definitions of resilience and adaptive capacity, refer to section 1.1.2 in Lavell et al., 2012). To achieve development requires SD initiatives to be realigned with CCA and DRR concerns. Building resilience in communities has been found to be an effective way to reduce disaster risk as well as vulnerabilities (World Food Program, 2011). Hence, the concept of resilience may offer a means of breaking down the individual concepts of DRR and CCA, thus presenting a common crosscutting theme (United Nations, 2012). Some authors suggest that SD itself could serve as a means of adaptation as it is directly linked with vulnerability reduction (Suarez and Ribot, 2003).

## 2.3 Insurance Effectiveness

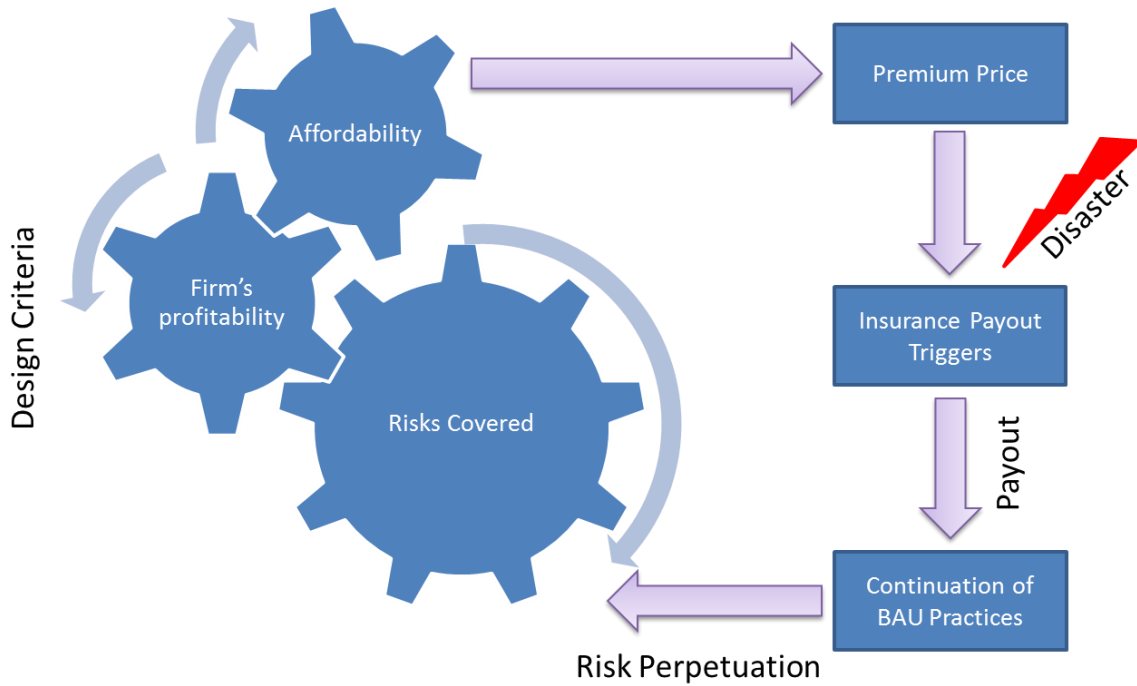
Traditional understanding of insurance effectiveness revolves around delivery of the contractual obligations, i.e. payouts as agreed in the contract. Insurance effectiveness is thus mainly assessed based on the number of people insured, avoidance of moral hazards and adverse selection, as well as minimization of basis risk (Figure 2.1). However, these indicators provide an inadequate and even misleading understanding of insurance effectiveness (Prabhakar, 2014a; Prabhakar, 2014b).

Traditionally, the insured are often not required to invest payouts in better risk mitigation practices. As a result, every disaster and the resulted payouts can perpetuate the risk. From this basic observation, it is clear that the assessment of insurance effectiveness in the contexts of DRR and CCA requires consideration of appropriate indicators.

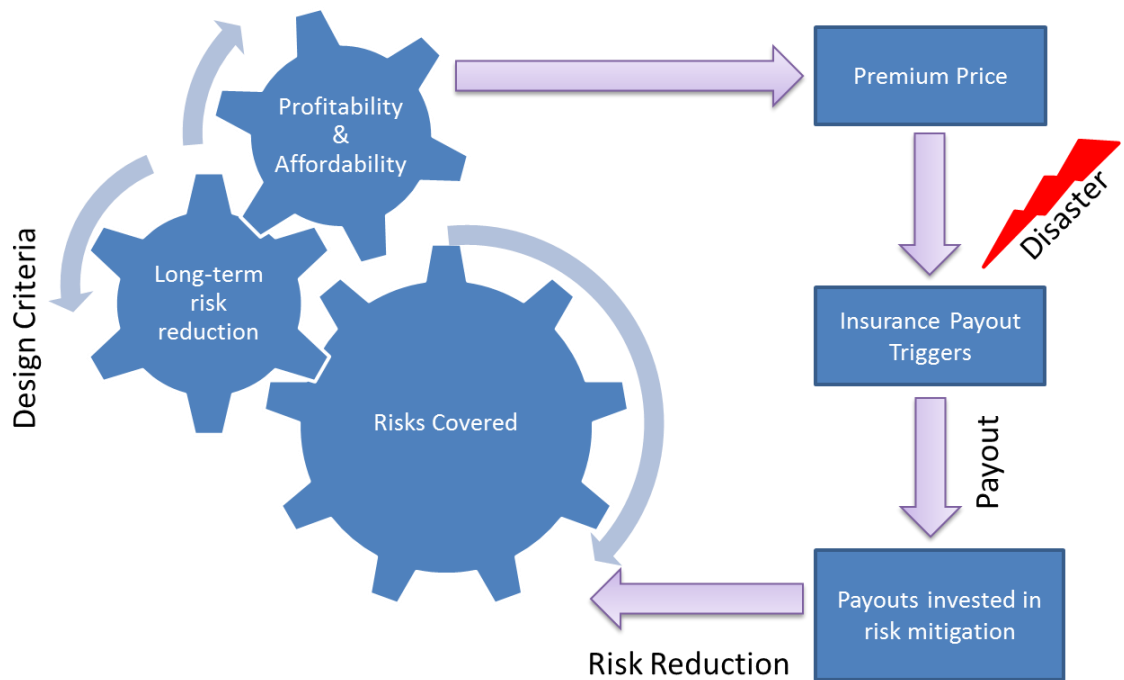
There is a need to change from a cycle of risk perpetuation to a cycle of risk reduction. The design of insurance and the payouts from insurance should promote long-term reduction of vulnerability to threats to provide DRR and CCA benefits (Prabhakar, 2014a; Prabhakar, 2014b). As depicted in Figure 2.2, long-term risk reduction could be included as an insurance design criteria, with the insured required to invest payouts in risk mitigation practices after every payout. In this way, payouts would lead to risk mitigation rather than business-as-usual practices, resulting in net risk reduction. Payouts would no longer encourage high risk profit seeking behavior. However, this could only happen if a proper risk price signal is conveyed to the insured. The price of insurance is often heavily subsidized in most developing and developed countries; subsidies range between a producer loss ratio of 75% in Pakistan, China and Japan to as much as 350% in India (Food and Agriculture Organization of the United Nations, 2011). Subsidized premiums will not convey the real price signal leading to continuation of existing practices with no net reduction in risk. Most of these issues are linked to the insurance design and support services (e.g. education on risk management) for insurance buyers (Prabhakar, 2014b).

Figure 2.3 shows how conventional insurance may not lead to CCA outcomes (based on Prabhakar, 2014b). In a situation of repeated droughts and high vulnerability, the wellbeing of communities will be drastically impacted (image on left). Even though they may be able to recover to a certain extent after each drought, wellbeing will decline over the long-term. In a scenario where traditional insurance operates, with all its design and implementation limitations discussed in this report, the recovery from the disaster will be faster and the communities may be able to recover their pre-disaster level of wellbeing. This could be described as a situation of resilience (center image). The time taken to return to the earlier condition depends on the extent of damage covered by the insurance, the perils covered and how soon the payouts are made. In an adaptation situation (right image), communities are better able to deal with shocks while maintaining their adaptive capacity, leading to a long-

term rise in their wellbeing. There is a need for the discussion on insurance effectiveness moves towards the adaptation scenario.

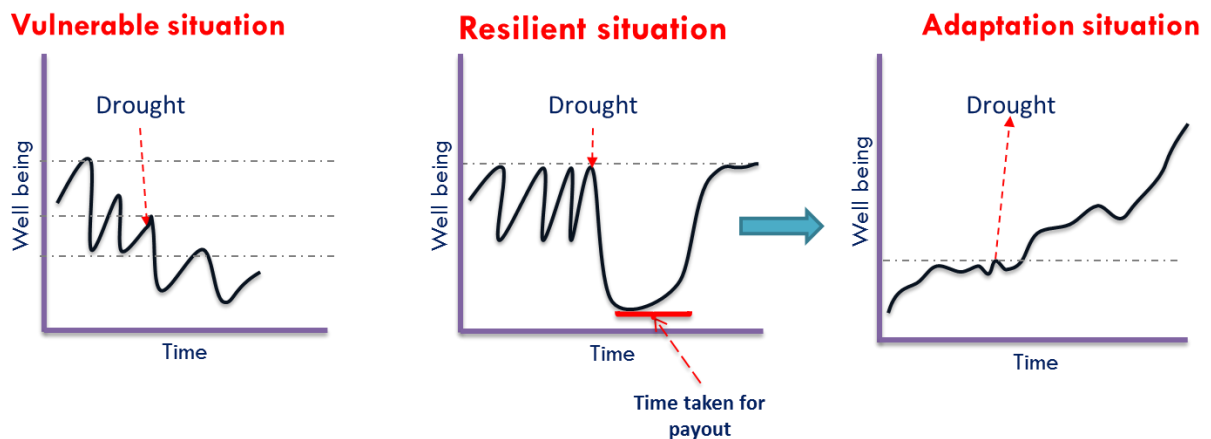


**Figure 2.1. Traditional notion of insurance effectiveness leading to risk perpetuation**



**Figure 2.2. Insurance leading to risk reduction cycle**

Source: Based on Prabhakar, 2014a



**Figure 2.3. Moving from resilience to adaptation**

Source: Based on Prabhakar, 2014b

Despite the ‘commonly assumed’ benefits of insurance, the evidence of insurance effectiveness in terms of long-term DRR and CCA outcomes is limited. Furthermore, the potential of insurance to benefit the most vulnerable groups has not been adequately explored. To address this gap, the Asia-Pacific Network for Global Change Research (APN) is funding the project “Assessing community risk insurance initiatives and identifying enabling policy and institutional factors for maximizing CCA and DRR benefits of risk insurance” led by the Institute for Global Environmental Strategies (IGES), Japan. The objectives of the project are to identify technical, socio-economic, institutional and policy barriers limiting the penetration of risk insurance, with a focus on rural populations; assess CCA and DRR benefits and costs accrued through risk insurance initiatives; identify features of an enabling environment to scale up risk insurance; and sensitize policy makers and other stakeholders about challenges and solutions for scaling up risk insurance. As a part of the methodology employed by the project, a workshop comprising experts from the insurance sector, researchers and practitioners was held on 4-5 July 2014 in Bangi, Malaysia, to review evidence and assess effectiveness of insurance for DRR and CCA.

## 2.4 Addressing Insurable Risks

Insurable risks are those risks that meet the criteria set for efficient operation of insurance (e.g. loss due to chance, measurable, predictable, determined based on large exposure units that are randomly chosen, non-catastrophic and large exposure units). The extent to which insurance can help the insured recover from disaster losses largely depends on characterizing and quantifying the insurable risks that the insurance agency is willing to insure. Several barriers limit the extent to which insurable risks in the Asia-Pacific region are covered, though ways to overcome these have been studied and are being tested.

The insurable risks in the agriculture sector can be grouped into six major categories (Table 2.1). These are risks with large exposure units, prospects for accidental loss, losses that are



measurable, losses that are determinable, losses that are not catastrophic and premiums that are economically feasible. A description of each risk category and the barriers to addressing these insurable risks and proposed interventions to overcome these are provided below.

**Characteristics of the exposure units:** Size is a main characteristic of exposure units. Large exposure units are subject to the law of large numbers where the actual loss is equal to probable loss. In the agricultural sector, the issues associated with the exposure units relate to age, education, risk perception, farm size, relief dependence, willingness to pay and accessibility (Abu-Bakar, 2014).

Age, education and accessibility to agricultural insurance are also important characteristics of exposure units, which were highlighted in a study conducted in Malaysia in 2013 into crop insurance. Seventy per cent of the farmers surveyed suggested that crop insurance could be an alternative to government financial aid programs (Prabhakar et al., 2013). However, only a third admitted that they have good understanding of crop insurance. About 76% of those surveyed were unwilling to pay for crop insurance and believed that government should subsidize the premium. The same study revealed that younger farmers are more likely to purchase crop insurance. It is evident that younger farmers are more open to considering the purchase of crop insurance than older farmers, whose attitude reflects a dependency upon government subsidies. Accessibility barriers can be overcome by strengthening distribution channels and developing a diversity of products, such as in China where there are 160 agricultural insurance products in the market for the agrarian community (Yanli, 2009).

**Accidental loss:** Insurable losses are those that are associated with accidental loss where units of exposure are randomly selected. The two barriers related to this are moral hazard<sup>1</sup> and adverse selection<sup>2</sup>. Moral hazard exists in crop insurance but it has been reported that contracts with multiple years of cover can help to mitigate this problem (Vercammen and Van Kooten, 1994). Product innovations involving multiple year coverage as well as compulsory participation in insurance schemes have been proposed to address this issue.

**Measurable loss:** In order to be insurable, loss must be measurable. There are several established ways to measure losses that take into account variables such as frequency, severity and loading factors. The main barrier for the agrarian community regarding the measurability of loss is lack of data. The way forward would be to develop comprehensive data sets relating to risk factors, promote incentives for group farming and sharing of data among insurers.

**Determinable loss:** In order to be insurable, the actual loss must be determinable, which requires the time, place and cause of loss to be all accounted for. Fair assessment and trust are

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<sup>1</sup> Moral hazard is a situation where the farmer makes spurious claims and behaves carelessly and ultimately increasing risks which could wipe out the benefits of insurance.

<sup>2</sup> Adverse selection refers to a situation where high risk takers have high propensity of buying the insurance which puts insurers at risk if not accounted for in the insurance price.

critical. A major barrier is lack of data for underwriting, due to limited databases with details of farmers, varying characteristics of both infrastructure and farming practices as well as paucity of information on historical yield (Rao, 2011). An actuarially fair premium or fair loss assessment is also hindered by lack of expertise, and this undermines the trust of the agrarian community in loss assessment. To overcome these issues, the way forward is to develop a comprehensive database of farmers, enhance the capacity of loss adjusters and develop index-based products.

**Catastrophic loss:** For risk insurance to be effective, the insurable loss must not be catastrophic in that loss exposure should be independent and individual losses should not be severe. Exposure to climate risk is systemic and losses are severe when farmers take time to recover. In order to address climate risks, government disaster relief programs may in many instances need to support the agrarian communities recover from high losses. These communities simply cannot afford to take out insurance for catastrophic losses, as the insurance cost would be very high. As a consequence, the speed of recovery following a catastrophic event often will depend on the timeliness and duration of aid. The way forward in such cases is to promote self-insurance at the local level and spread risk across countries and regions. Self-insurance operates by individuals putting aside a certain amount of money (for example as savings) as a strategy to better cope with future losses.

**Economic feasibility:** Premiums must be economically feasible in that they should be both affordable to the target group and profitable to insurers. A barrier in this respect is the low income of most farmers and their high dependence on agriculture. In the case of Malaysia, more than 50% of farmers are considered to be in the low income category, while in terms of farm size the majority (52.5%) own or lease less than a two hectare paddy farm (Abu-Bakar, 2014). For low-income farmers with a high dependence on agriculture, interventions to provide off-farm income, and innovative premium collection or product design can be considered as options to improve the efficiencies in offering insurance and lowering the price of the premiums. An additional barrier to providing economically viable premiums is the impact of high risk events on the cost of the insurance premiums, often placing such insurance products out of the reach of farmers. Blanket and significant subsidies have been resorted to as a means of making insurance premiums affordable. However, such approaches have often led to non-conveyance of the proper risk price to the farmers resulting in risk taking behavior. This is primarily linked to systemic risk associated with extreme events. In this case, the relatively high cost of insurance has made it more difficult to design a workable crop insurance scheme (Rao, 2011). Several interventions have been proposed, including employing risk management strategies. These encompass risk avoidance, risk control (loss prevention and loss reduction), risk financing (through risk retention, risk transfer via insurance and alternative risk transfer), non-insurance transfer and internal risk reduction.

**Table 2.1. Barriers and proposed interventions in the agriculture sector**

Characteristics of Insurable Risks	Barriers	Proposed Intervention
Large exposure units	<ul style="list-style-type: none"> <li>• Age, education, risk perception, farm size of farmers</li> <li>• Relief dependence &amp; willingness to pay</li> <li>• Accessibility</li> </ul>	<ul style="list-style-type: none"> <li>• Bottom-up education</li> <li>• Moving from individual to group farming</li> <li>• Product innovation</li> </ul>
Accidental losses	<ul style="list-style-type: none"> <li>• Moral hazard</li> <li>• Adverse selection</li> </ul>	<ul style="list-style-type: none"> <li>• Product innovation – multiple year coverage</li> <li>• Compulsory participation</li> </ul>
Measurable losses	<ul style="list-style-type: none"> <li>• Lack of data</li> </ul>	<ul style="list-style-type: none"> <li>• Comprehensive data on risk factors</li> <li>• Incentive for group farming</li> <li>• Sharing of data among insurers</li> </ul>
Determinable losses	<ul style="list-style-type: none"> <li>• Fair assessment</li> <li>• Lack of trust</li> </ul>	<ul style="list-style-type: none"> <li>• Comprehensive database of farmers</li> <li>• Trained and independent loss adjusters</li> <li>• Index-based products</li> </ul>
non-catastrophic	<ul style="list-style-type: none"> <li>• Exposure to climate risk is systemic risk</li> <li>• Severe losses and long recovery period</li> </ul>	<ul style="list-style-type: none"> <li>• Promoting self-insurance at local levels</li> <li>• Spreading of risk across countries/regions</li> </ul>
Economically feasible premiums	<ul style="list-style-type: none"> <li>• Low income farmers and high dependence on agriculture</li> <li>• High risks leading to high premiums</li> </ul>	<ul style="list-style-type: none"> <li>• Promoting off-farm income</li> <li>• Innovative premium collection</li> <li>• Product design</li> <li>• Lower administrative cost</li> <li>• Mandatory combination of risk management and risk mitigation strategies</li> </ul>

Source: Abu-Bakar, 2014

## 2.5 Insurance for the Most Vulnerable Groups

The overall welfare benefits of insurance for DRR and CCA can be enhanced by increasing outreach to the most vulnerable groups. Communities that are marginalized are especially vulnerable to climate change (IPCC, 2014). This heightened vulnerability is the result of interaction between inequalities in socioeconomic status and income, as well as in exposure resulting from the social processes. The poor and marginalized people are the most

vulnerable to climate change as they have limited ability to cope with many of the key risks that are associated with climate change and related hazards. In Asia, poverty is widespread in agrarian communities due to heavy dependence on natural resources and ecosystem services that are directly influenced by weather and climate and this situation is expected to continue for decades to come (Hijioka et al., 2014). The impacts of climate change will also create new poverty traps in urban areas and this is relevant to urbanizing Asia.

Insurance programs, social protection measures and disaster risk management strategies that take into account poverty and multidimensional inequalities can enhance resilience among vulnerable communities (IPCC, 2014). Insurance can serve as a tool that provides incentives for loss reduction and resilience building activities that will serve to reduce social vulnerability. However, fewer than 10 million of the estimated 4 billion people worldwide who live on less than US\$ 2 a day currently have access to formal insurance from a regulated financial institution (Demirguc-Kunt and Klapper, 2012).

Insurance accessibility is a problem for poor farmers and vulnerable groups in general. The barriers to increasing accessibility are associated with the lack of an enabling environment, access to information, growth of inclusive markets, as well as coverage and inclusion. The barriers and some proposed ways forward are listed in Table 2.2, which is followed by a more detailed discussion of each set of barriers and possible solutions.

**Table 2.2. Barriers that hinder insurance as a usable tool for the most vulnerable groups and possible ways forward**

Features	Barriers	Way Forward
Culture of risk management	<ul style="list-style-type: none"> <li>• Avoidance of catastrophic losses</li> <li>• Low awareness of risk</li> <li>• Lack of information on temporal aspects of risk</li> <li>• Knowledge gaps on acceptable levels of risk and thresholds</li> </ul>	<ul style="list-style-type: none"> <li>• Creation of incentives to promote positive and collective risk management behavior</li> <li>• Integration of risk management into public education programs</li> <li>• Protection against climate-related risks through prevention and risk reduction measures</li> <li>• Identification of context specific acceptable levels of risk and thresholds</li> </ul>
Access to information	<ul style="list-style-type: none"> <li>• Lack of decision support tools</li> <li>• Lack of data</li> </ul>	<ul style="list-style-type: none"> <li>• Identify needs and bridge current gaps</li> <li>• Increase availability of data on weather and climate extremes</li> <li>• Develop index based products</li> </ul>
Growth of inclusive markets	<ul style="list-style-type: none"> <li>• Lack of technical support and information on social safety</li> </ul>	<ul style="list-style-type: none"> <li>• Development of social safety nets as a complement or alternate to</li> </ul>

Features	Barriers	Way Forward
	<ul style="list-style-type: none"> <li>• Poor integration of social aspects and non-economic values</li> <li>• Use of subsidies unexplored</li> <li>• Poorly structured incentive systems</li> <li>• Levels of capitalization not quantified</li> </ul>	<ul style="list-style-type: none"> <li>• Develop comprehensive risk management approaches that integrate social aspects and non-economic values</li> <li>• Investigate appropriate use of subsidies</li> <li>• Establish context specific structuring of incentives linked to insurance</li> <li>• Identify adequate levels of capitalization for sustainability</li> </ul>
Coverage and inclusion	<ul style="list-style-type: none"> <li>• Vulnerable groups are not specifically targeted</li> <li>• Unclear roles of public and private sectors</li> <li>• Lack of stakeholder interaction</li> <li>• Weak governance systems</li> </ul>	<ul style="list-style-type: none"> <li>• Re-think the concept of insurance to include the very poor farmers into the value chain</li> <li>• Delineate roles of the public and private sector in climate risk insurance</li> <li>• Bring stakeholders together to identify perceived and existing gaps in the insurance industry, create enabling frameworks and bridge knowledge gaps in designing appropriate regulations</li> <li>• Innovate and create accountable and fair insurance approaches</li> </ul>

Source: Adopted from Becker, 2014

**Culture of Risk Management:** Climate change is associated with systemic and prevalent risks. Some of the risks may be associated with catastrophic losses, making the risk uninsurable. The low awareness of climate change risks and lack of information on temporal aspects of risk also pose challenges to make insurance feasible for the most vulnerable groups. Other issues that need attention include acceptable levels of risk as well as selection and definition of appropriate thresholds, above which coping capabilities are exhausted. These issues are context specific and are related to monetary, cultural, security or wellbeing related concerns, among others. In such cases, incentives have to be created to encourage people to take the right risk management behavior. Risk awareness derived from risk assessment through insurance expertise and services needs to be effectively integrated into public education programs.

**Access to information:** A major challenge for the insurance sector is access to information. Decision support tools to help decision makers allocate limited resources among a range of

risk management tools are limited. Similarly, databases that can support assessment such as weather data to design a viable insurance product are not always available, particularly in developing countries. Such gaps need to be identified before any insurance scheme can be effectively promoted for the most vulnerable groups.

**Growth of inclusive markets:** Presently, technical support and information on how social safety nets can be used as a complement or even as an alternative to risk insurance are lacking. Integration of social issues and non-economic values in comprehensive risk management approaches has also not advanced. The use of appropriate subsidies as well as context specific and structured incentive systems that are informed through expertise from the insurance sector have not been adequately explored. In the case of financial risk transfer approaches, levels of capitalization required to achieve sustainability have not been established.

**Coverage and inclusion:** Vulnerable groups are not specifically targeted by the insurance sector. Unclear roles of public and private sectors, lack of stakeholder interaction and weak governance systems are also fundamental issues that need to be resolved. Innovation is required to ensure insurance products can penetrate countries that lack stable and functioning governance systems to assure accountability and fairness. These fundamental issues need to be resolved before the rural poor communities will be able to use insurance as part of their risk mitigation strategies.

## 2.6 Conclusions

Agrarian and poor communities in general in the Asia-Pacific region are highly vulnerable to climate change and for effective reduction of vulnerabilities require aligning of SD, CCA and DRR initiatives. Insurance has been increasingly advocated as a risk management tool. However, from the discussion in this chapter, the uptake and effectiveness of insurance is low in the agricultural sector and amongst vulnerable groups. Major barriers exist, and while ways to overcome these can be suggested, the limits of insurance must also be recognized. Insurance does not prevent the occurrence of losses but it does have the potential to benefit DRR and CCA if the current barriers are adequately addressed. Each country has unique risk and vulnerability contexts and thus crop insurance implementation must be context specific and targeted to specific agrarian communities.

Public-private partnerships in which government works in conjunction with insurers will enhance the potential and effectiveness of insurance for the agrarian community. Insurers need to focus on product innovation, compulsory and multiple year coverage, development and sharing of comprehensive database and capacity enhancement of loss adjusters, among others. In terms of the agrarian community, more needs to be done to enhance awareness and effect change in behavior, from a subsidized victim mentality to a proactive collective risk management approach.

Fewer than 10 million of the estimated 4 billion people worldwide who live on less than US\$ 2 a day currently have access to formal insurance. Furthermore, there are fundamental challenges associated with the lack of targeting of vulnerable groups, unclear roles of public and private sectors, lack of stakeholder interaction, and weak governance systems which make insurance in its current form unviable to the most vulnerable households. The design of insurance should take into account poverty and multidimensional inequalities to enhance resilience among vulnerable communities. The growth of inclusive markets needs to be promoted to make insurance more viable. Governments must move out from blanket subsidies to targeted subsidies in order to maximize the welfare benefits and to make insurance available to the most vulnerable groups.

There is a need to revisit the concept of insurance effectiveness in order to maximize the potential for insurance to deliver disaster risk reduction and climate change adaptation benefits. The following chapter discusses insurance effectiveness indicators from this perspective.

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## Chapter 3

# Indicators to Assess Insurance Effectiveness

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Sivapuram V.R.K. Prabhakar and Divya S. Solomon

### 3.1 Introduction

The previous chapter discussed the barriers that limit the effectiveness of insurance in the rural sector of developing countries in the Asia-Pacific region and possible approaches to address these barriers. To offer effective insurance products requires the insurance designers and agencies that regulate insurance to have access to a set of methodologies and indicators that will help them to assess the effectiveness of insurance. Keeping this need in view, this chapter reviews the available methodologies for assessing insurance effectiveness and proposes indicators to evaluate the effectiveness of agriculture based risk insurance with respect to CCA and DRR outcomes. The chapter is based on a literature review and benefits significantly from discussions that took place during the regional consultation workshop on "Evidence for Disaster Risk Reduction and Climate Change Adaptation Effectiveness of Insurance: Challenges and Opportunities", Bangi, Malaysia, 4-5 July 2014.

Existing literature suggests that there is tremendous potential for insurance to reduce the vulnerability of poor households to natural hazards. However, little is known about how risk insurance actually benefits communities and how it can be measured. An attempt is made in this chapter to identify methodologies and indicators to help in the quantification of benefits with a view to the scaling up of risk insurance, especially in the agriculture sector. In order to quantify the impacts of agriculture risk insurance, an Impact Pathway Framework for Assessing Risk Insurance (IFPARI) has been presented to map the primary and intermediary

effects of agricultural risk insurance upon stakeholders and how this will ultimately influence CCA and DRR outcomes in developing countries (Solomon and Prabhakar, 2014).

## 3.2 Effectiveness Experiences from Insurance Studies

This chapter seeks to provide a collective overview of selected insurance based studies that have been conducted in the Asia-Pacific region in recent times. The key purpose is to help identify the methodologies employed in the literature to quantify insurance benefits. This approach is adopted in order to develop a framework of indicators that can effectively identify the costs and benefits of insurance and how insurance specifically contributes to CCA and DRR (See Table 3.1).

There is a gap in the literature regarding studies of the long-term effects of insurance, especially the effects of agricultural insurance (Cole et al., 2012). The review undertaken for this chapter reveals that most studies of index based agricultural insurance effectiveness focus on uptake rather than actual benefits. Moreover, most of the documented work available relating to agriculture insurance is based upon theoretical principles and a large number of studies deal with hypothetical situations in relation to insurance take up (Cole et al., 2012). Although agricultural insurance is being pioneered in many countries in the Asia-Pacific region, there is a dearth of empirical studies that could be used to establish criteria for quantifying the effects of insurance.

Microfinance and heavily subsidized insurance programs target the poorest groups and they aim to help poor households deal effectively with risk. They have a financial as well as social agenda. This makes the ability to adequately assess the effectiveness of insurance a complicated affair. It is difficult to quantify the impact of insurance on social issues across a range of stakeholders. It is easier to measure the financial impacts of these programmes, as the principles have been generously borrowed from microfinance and accounting (Brau and Woller, 2004). It is also important that the methodologies selected for impact assessment must be capable of extracting intricate results from complicated processes, in addition to being able to measure intangible impacts as well.

A need to analyze the impacts of various microinsurance<sup>3</sup> programmes is emerging. In order to prioritize the necessity of microinsurance among various risk management options an appropriate evaluation design is required. These designs can be either experimental or quasi experimental (Bock and Ontiveros, 2013). Regardless of whether the designs are experimental or quasi experimental, in order to give impetus within programs for climate

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<sup>3</sup> Microinsurance is a form of insurance tailored to low-income groups and has the following characteristics: the insured amounts are small; premiums are priced mostly at the community level; irregular cash flows of the insured are accommodated; screening procedures are less stringent; and policy documentation and conditions are kept easy to understand.

change adaptation (CCA), it is necessary to understand the benefits of agricultural microinsurance within the spectrum of climate change adaptation and disaster risk reduction. The review undertaken for this chapter covers studies where attempts have been made to analyze the costs and benefits of agricultural insurance with importance given to its effectiveness in disaster risk reduction (DRR) and CCA.

The review found that various methodologies have been employed in attempts to measure the effectiveness of microinsurance programs. In a study funded by the World Bank to explore the experiences and lessons learnt from previous microinsurance programs (Patoja, 2002), the DRR conceptual framework was used on both household and institutional levels. The DRR process focused upon four key concepts: preparedness, response, recovery and prevention. Secondary data collection through literature reviews and interviews with pertinent stakeholders and experts was used to determine the level of effectiveness of insurance based studies in various countries. The study was qualitative in approach and no attempts were made to quantify benefits or costs. The primary focus of the study was to determine the benefits of microinsurance programs for DRR. The possible linkages with CCA were not addressed in the study. Also, the results of the study cannot be generalized due to the specificity of the study area.

Another World Bank study assessed the performance of crop insurance in Karnataka, a southern state in India which has had a variety of index insurance programs (Kalavakonda and Mahul, 2005). This study examined the effectiveness of the entire agricultural risk insurance sector in Karnataka. The focus of this technically-based study related to assessing uptake and coverage, and operational and financial effectiveness of the product. As a result of its focus, the study is primarily relevant to the financial institutions and government implementing the program.

A large scale cross country examination of disaster microinsurance offered by multiple organizations in India is reported in 'Disaster Microinsurance for Pro-Poor Risk Management: Evidence from South Asia' (Hochrainer-Stigler et al., 2012). The purpose of this paper was to assess the effectiveness of disaster microinsurance in helping households cope with disasters. Primary data on perception of clients on the benefits of the insurance were collected through stratified sampling with a control group. Socio-economic variables were often used as a proxy indicator for effectiveness of the program. This perception-based study was limited to the clients of microinsurance and other stakeholders were not consulted. The long-term transformational effects were also not taken into consideration.

**Table 3.1. Costs and benefits identified and methodologies employed by selected insurance case studies**

Insurance case	Background and Methods employed	Benefits of insurance	Costs of insurance
Patterns of rainfall insurance participation in rural India (Gine et al., 2007)	<p><b>Background:</b> This paper presents evidence regarding the uptake of rainfall insurance by rural farmers in India. Determinants of acceptance of insurance are examined using empirical means.</p> <p><b>Methodology:</b> Household surveys that enumerate self-reported benefits of insurance.</p>	Not specified	<ul style="list-style-type: none"> <li>• Undermine existing indigenous risk sharing mechanisms.</li> <li>• Risk of rainfall insurance being purchased exclusively by the wealthy could result in increased prices of local traded goods during periods of low rainfall.</li> </ul>
Disaster microinsurance for pro poor risk management: Evidence from South Asia (Hochrainer-Stigler et al., 2012)	<p><b>Background:</b> Multi country assessment of the benefits and costs of microinsurance programs in South East Asia.</p> <p><b>Methodology:</b> Through primary surveys and secondary data collection, the quantified benefits are self-reported by the respondents.</p>	<ul style="list-style-type: none"> <li>• Helped to reduce the shocks of disaster on farmers.</li> <li>• Helped in alleviation of post disaster poverty by reducing post disaster borrowing patterns.</li> <li>• Uptake of insurance has made farmers more open to proactive measures of reducing risk.</li> </ul>	<ul style="list-style-type: none"> <li>• The product is poorly subsidized by the government leading to additional financial burden on the consumer.</li> <li>• Microinsurance does contribute to covering losses in case of disaster events however it is usually not sufficient to cover all losses and can lead to an increase in indebtedness.</li> <li>• The long and tedious claims process does not provide financial liquidity immediately in case of an emergency.</li> </ul>
The effectiveness of index-based micro-	<p><b>Background:</b> Review to assess the effectiveness of weather based crop</p>	<ul style="list-style-type: none"> <li>• Increased uptake of index insurance has resulted in reduced income variability</li> </ul>	<ul style="list-style-type: none"> <li>• Large evidence gap regarding the impacts of index insurance.</li> </ul>

Insurance case	Background and Methods employed	Benefits of insurance	Costs of insurance
insurance in helping small holders manage weather related risks (Cole et al., 2012)	<p>insurance in developing countries in Africa and Asia. The study assesses the demand of insurance products and the effect of them on the overall wellbeing of the households.</p> <p><b>Methodology:</b> Based on meta-analysis of project reports and surveys of experts. Benefits are based on available documentation.</p>	<p>and improved consumption smoothing.</p> <ul style="list-style-type: none"> <li>Helped in building of assets basis of households which protects the household from shocks to investment.</li> <li>Improvement in the education and health outcome, which serves as an adaptation for the long-term effects of climate change.</li> </ul>	<ul style="list-style-type: none"> <li>The product itself is seen to be risky due to the basis risk and lack of sufficient knowledge regarding the product leading to low uptake.</li> </ul>
Crop Insurance in Karnataka (Kalavakonda and Mahul, 2005)	<p><b>Background:</b> The aim of this study is to analyze the crop insurance scheme in place in Karnataka and analyze its effectiveness in terms of minimizing impacts of natural disaster related crop losses.</p> <p><b>Methodology:</b> Assessed based on the responses from a household survey of farmers.</p>	<ul style="list-style-type: none"> <li>The agricultural insurance scheme works along with national and state disaster relief programs to provide post disaster relief.</li> <li>Restore the credit reliability of farmers for future credit.</li> <li>Stabilizing of farm income.</li> <li>Helps farmers adopt more technologically advanced methods which also helps in future adaptation against climate change.</li> <li>Schemes are being proposed by the Karnataka government which will work in tandem with disaster mitigation plans.</li> </ul>	<ul style="list-style-type: none"> <li>Reaches a small percentage of poor farmers. Does not target the most vulnerable.</li> <li>Catastrophic losses are the norm rather than the exception in Karnataka and as premiums are not priced as per the risks it results in losses for insurers.</li> <li>The operational effectiveness of the project is quite low.</li> </ul>
Index Insurance and Climate Risk Prospects for development and	<p><b>Background:</b> Case studies in Africa regarding weather insurance are analyzed to understand the impacts of index insurance</p>	<ul style="list-style-type: none"> <li>Index insurance was seen to be most effective when integrated within the disaster management framework.</li> </ul>	<ul style="list-style-type: none"> <li>The exact impacts of index insurance are not known.</li> <li>Index insurance alone cannot be</li> </ul>

Insurance case	Background and Methods employed	Benefits of insurance	Costs of insurance
disaster management (Hellmuth et al., 2009)	<p>with regards to climate change and disaster management</p> <p><b>Methodology:</b> Summarizes the insurance benefits based on three case studies in Africa. Benefits are based on available documentation. No specific empirical methodology adopted.</p>	<ul style="list-style-type: none"> <li>• Insurance addresses the unresolved risk from disaster management programs.</li> <li>• Improved accessibility to resources.</li> </ul> <p>Index insurance behaves as a mechanism to act as an incentive for risk reduction behavior among farmers.</p>	<p>used as an effective disaster management device, it is imperative that it is used in conjunction with other disaster management programs as well.</p>

Source: Compiled by authors from sources cited in the table.

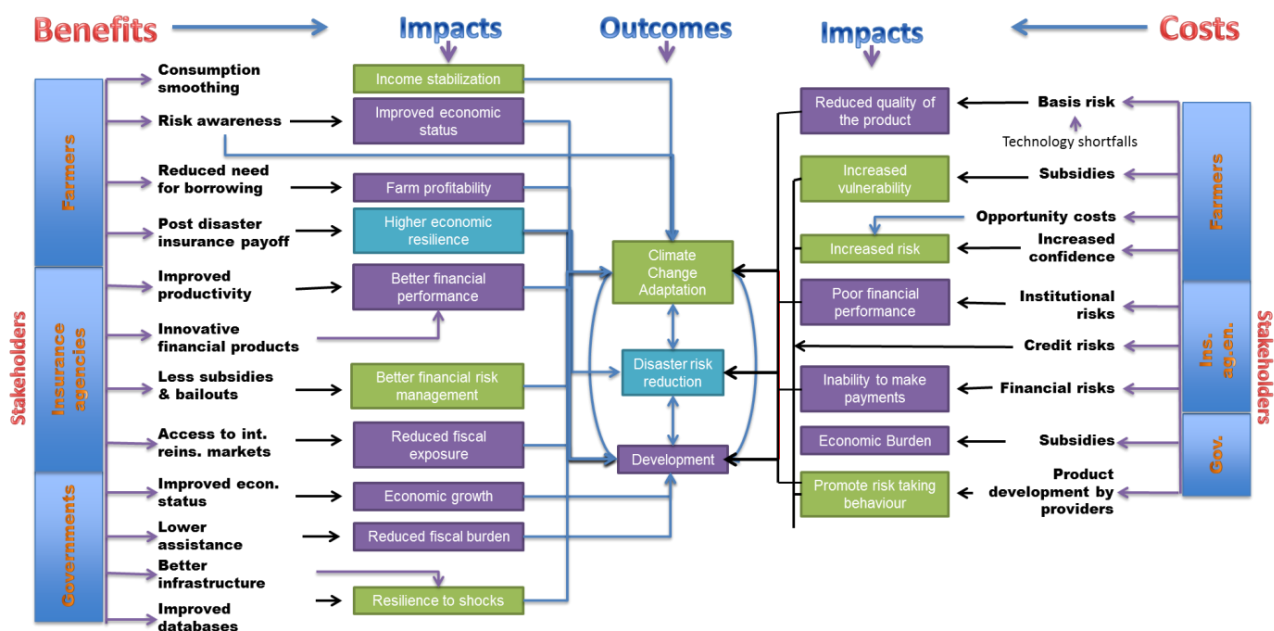


A recent study by the Evidence for Policy and Practice Information and Co-ordinating Centre in London sought to measure the effectiveness of index based microinsurance in helping stakeholders manage weather related risks (Cole et al., 2012). This study was a meta-analysis of previous studies on the effects of index insurance. A keyword search was conducted on published and unpublished data, which was then used to shortlist case studies that dealt exclusively with the uptake and impact of index insurance. A realistic synthesis based approach was used, employing a causal framework for the production and consumption channels related to insurance uptake. This was used to collect evidence regarding the effectiveness of index insurance in helping farmers cope with weather related risks. This study helped to identify notable patterns within index insurance case studies. Its main objective was to explore issues with regards to existing forms of disaster insurance. As a meta analysis, the study can only provide trends in terms of the effects of index microinsurance, which cannot be generalized.

In all the studies reviewed, no evidence was presented on the impacts of insurance on long-term risk reduction. Further, the potential benefits of insurance for CCA were not examined. The studies examined insurance effectiveness mostly using traditional effectiveness indicators such as insurance coverage, operational effectiveness, financial performance, insurance uptake and willingness to purchase, information on insurance, product design and marketing issues, etc.

### **3.3 Insurance Effectiveness Indicators**

Figure 3.1 is a relational diagram constructed from a limited literature theorizing costs and benefits of insurance, moving from the micro (individual) level to the macro (government) level under different domains (adapted from Solomon and Prabhakar, 2014). With CCA, DRR and development as outcomes at the center, the benefits are drawn from the left-hand side of the diagram and the costs from the right-hand side. The indicators were identified based upon the theorized impact of insurance within the purview of development, DRR and CCA. Table 3.2 presents a list of indicators identified from the discussions carried out at the regional expert workshop "Evidence for Disaster Risk Reduction and Climate Change Adaptation Effectiveness of Insurance: Challenges and Opportunities", Bangi, Malaysia, 4-5 July 2014. These indicators are discussed below according to actors, i.e. farmers, insurance agencies and governments.



**Figure 3.1. Impact pathway framework for identifying DRR and CCA benefits of risk insurance**

Source: Adapted from Solomon and Prabhakar, 2014

**Table 3.2. Indicators for assessing the costs and benefits of risk insurance approaches**

Level	Cost indicators	Benefit indicators
<b>Farmers</b>	<ul style="list-style-type: none"> <li>Premium price</li> <li>Opportunity costs</li> <li>Transaction costs</li> <li>Probability of reduced mitigation</li> <li>Costs of preventing mitigation</li> </ul>	<ul style="list-style-type: none"> <li>Reduced uncertainty of losses</li> <li>Reduced income variability</li> <li>Reduced farm debt</li> <li>Business continuity</li> <li>Increased speed of recovery</li> <li>Risk taking behavior</li> <li>Asset preservation</li> <li>Reduced anxiety</li> <li>Strategic decision-making</li> </ul>
<b>Community</b>	<ul style="list-style-type: none"> <li>Reduced social support</li> <li>Reduced risk coping</li> </ul>	<ul style="list-style-type: none"> <li>Redistribution of risks</li> <li>Reduced anxiety</li> <li>Social capital</li> <li>Enhanced social status</li> <li>Reduced informal borrowings</li> <li>Increased access to insurance-related information</li> </ul>

Level	Cost indicators	Benefit indicators
<b>Insurance Companies</b>	<ul style="list-style-type: none"> <li>• Management costs</li> <li>• Claim costs</li> <li>• Marketing costs</li> <li>• Administrative costs</li> <li>• Loss adjustments costs</li> <li>• Arbitrage costs</li> <li>• Legal expenses</li> <li>• Costs of reinsurance</li> <li>• Costs of data/technologies/information</li> <li>• Research and development</li> </ul>	<ul style="list-style-type: none"> <li>• Improved penetration in insurance markets</li> <li>• Spreading and diversification of risks</li> <li>• More clientele</li> <li>• Improvement of social responsibility and reputation</li> <li>• Operational efficiency</li> </ul>
Government	<ul style="list-style-type: none"> <li>• Subsidy costs</li> <li>• Capital costs of program implementation</li> <li>• Administrative costs</li> <li>• Reinsurance costs</li> <li>• Regulatory costs</li> <li>• Monitoring and evaluation</li> </ul>	<ul style="list-style-type: none"> <li>• Saving of social welfare funds</li> <li>• Social responsibility</li> <li>• Reduced relief expenditure</li> <li>• Social safety net</li> <li>• Macro financial stability</li> <li>• Access to risks transfer</li> <li>• Taxes from insurers</li> </ul>

Source: Produced from the group discussion at the expert consultation workshop on Evidence for Disaster Risk Reduction and Climate Change Adaptation Effectiveness of Insurance: Challenges and Opportunities, 4-5 July 2014, Bangi, Malaysia

### 3.3.1 Farmers

The benefits at farmer level could include income stabilization, improved economic status and farm profitability, and greater economic resilience, while an important cost could be an increase in farmers' propensity to take risks (Figure 3.1). Agricultural insurance targets farmers, seeking to address risks through a formal risk sharing mechanism. Rural farming communities around the world face fluctuating livelihoods and often engage in costly and inefficient risk coping strategies. At this level, the effect of insurance works primarily through four causal channels: consumption smoothing, building risk awareness, reduced need for borrowing and post disaster payout (Hellmuth et al., 2009; Warner, et al., 2009; Linnerooth-Bayer and Mechler, 2007). Agricultural risk insurance can lead to greater risk awareness and provide a secure livelihood causing behavioral changes within farmers if they are sufficiently educated and proper risk price signals are conveyed. With agricultural insurance schemes, households can safeguard their assets and shift the composition of their investments towards high yield, high risk cash crops (Hazell, et al., 2010).

Insurance serves to reduce 'risk rationing', where farmers can qualify for loans but they prefer to not take them up because of fear of losing the collateral i.e. usually fixed assets (Boucher and Mullally, 2010). Agricultural insurance has been shown to increase the rate of uptake of formal credit by farmers to enhance their agricultural operations and maximize profits. By contributing to the regularity and security of income, insurance could lead to an increase in inputs, including investment, in croplands. Availability of liquid capital after

disasters also reduces the need for households to sell assets and reduces credit constraints; this helps farmers escape from a poverty-vulnerability cycle (Aggarwal, 2010).

On the costs side, not addressing the basis risk can lead farmers with insurance to not receive sufficient post disaster payout after suffering losses. Improper design of the insurance product and insufficient and unreliable weather data can exacerbate basis risk resulting in an increase in vulnerability of farmers. Moral hazard is one of the primary risks of agriculture insurance, for example, when the farmer makes spurious claims and behaves carelessly. This ultimately increases risks which could wipe out the benefits of insurance.

### **3.3.2 Insurance companies**

The benefits and costs for insurance companies for engaging in the insurance business could vary depending on how the insurance products are designed and marketed and the prevailing policy environment. In general, insurance companies need to maintain their profits while keeping the premiums at an affordable level; company profits are directly proportional to the volume of insurance enrollments. Government subsidies help motivate more farmers to enroll in insurance and hence will help companies to stay in the business of risk management. The benefits could include better financial performance, better risk management ability and reduced fiscal exposure. The costs could include inability to make payments in the wake of a catastrophic loss especially when without reinsurance support.

Due to a renewed interest in market mediated risk pooling and opportunities for insurers to pool their covariate risks in the international market, agricultural risk insurance has become more viable (Hazell, et al., 2010). A recent report by Lloyd's regarding the financial viability of microinsurance for insurance institutions indicated that there is a huge potential for the development of insurance in developing countries, however along with the potential for profit there also exists high potential for losses within this sector. Designing innovative low-cost insurance products could help insurance companies reach those who cannot otherwise afford insurance.

On the other hand, insurance companies are also at risk by the nature of their business. The extent of exposure to disaster risks for insurance companies depends to a large degree upon the characteristics of the company itself, i.e. age, size and sustainability of the organization contribute to the level of exposure, which in turn is related to another important influencing factor, the company's outreach (sales) efforts. Companies which are larger and well established are at a lower level of risk than smaller locally-based ones.

Some microfinance companies are still very dependent upon external funding, which makes them vulnerable to collapse if support is withdrawn. One of the biggest risks that microfinance companies face is credit risk. This risk is exacerbated by natural disasters, the potential for fraud by the insured, and the potential for repayment defaults, which all lead to an increase in delinquency management costs. Post disaster liquidity risks are acutely faced

by smaller microfinance companies, which experience immediate shortfalls in their ability to meet client post disaster cash requirements. Liquid and financial risks can seriously undermine the financial stability of insurance companies, which can also impact their reputation.

### **3.3.3 Government-run insurance programs**

Insurance can have both benefits and costs for governments. For example, insurance benefits governments by reducing the fiscal burden emanating from relief payments, increases financial resilience and helps improve the overall risk management environment in the agricultural economy. Major costs include increased economic burden if insurance is heavily subsidized.

In a government-run insurance program, it is the role of the government to decide if a certain risk is insurable. It is within public interest to cover farmer's risks; however this should not result in farmers adopting unnecessarily risky behavior. Often, the government has to depend upon private companies to develop the product due to their greater experience and expertise, but this over-dependence can lead to insurance companies designing biased products (Sandmark, 2013). Governments have to consider the tradeoff between an underdeveloped agricultural system and a more developed agricultural system supported by potentially expensive budgetary allocations to insurance subsidies (Sandmark, 2013). Government-run insurance programs help rural people build resilience to disasters including by reducing post disaster losses; however, the financial feasibility of these programs should be taken into consideration. Financial products aid in strengthening rural economies and reducing poverty, thereby contributing to the overall successful functioning of the government. Moreover, insurance is an efficient risk spreading mechanism. Private sector penetration and non-subsidized insurance programs can help reduce the disaster burden upon governments.

Both Figure 3.1 and Table 3.2 show more theorized insurance benefits than costs. This should be viewed as only a preliminary attempt to set out the costs and benefits, and clearly further analysis is required. Depending on how the insurance is designed, e.g. whether or not it is subsidized, the net quantified benefits of insurance could vary. This exercise has revealed that the insurance effectiveness indicators are difficult to identify largely due to the complex ways in which insurance can impact the wellbeing of the insured, insurance agencies and the governments.

## **3.4 Conclusions**

The review of studies on insurance effectiveness indicates that the notion of insurance effectiveness in terms of CCA and DRR are more theoretical than evidence based. Generating evidence requires a robust framework that helps in connecting cause and effects. It is evident that there is both a dearth of literature that delves into the long-term impacts of insurance and a dearth of methodologies to assess insurance effectiveness in terms of DRR and CCA.

The major limitation in effectiveness measurement methodologies is the lack of a uniform set of indicators that are capable of measuring insurance outcomes. This made cross comparison between different studies and insurance products nearly impossible and a lack of clear definition of expected insurance outcomes for CCA and DRR made them irrelevant for our purpose of assessing the related benefits. The inferences obtained from most of the studies are at best vague and fail to give an accurate quantitative estimation of CCA and DRR outcomes of risk insurance. The studies also failed to show conditions that help ensure positive outcomes. When the studies did not illustrate expected outcomes it was usually attributed to a failure of the methodology. It was also observed that not one of the studies was able to identify the specific indicators that could be used to assess the impact of insurance on CCA and there were no efforts to quantify the benefits within the CCA arena.

The exercise of identifying insurance effectiveness methodologies and indicators showed that the dearth of literature quantifying real benefits and costs of insurance are due to the complexity of connections between CCA, DRR and SD, the complex ways in which stakeholders are impacted by insurance and limited understanding on the CCA, DRR and SD concepts among the related professionals. Consequently, the indicators presented in Figure 3.1 and Table 3.2 need to be further refined and a methodology needs to be developed to use these indicators for measuring the insurance effectiveness. Challenges such as measurability of the indicators and cost-efficiency would have to be overcome. In subsequent years, the project will conduct field investigations to collect disaggregated evidence on costs and benefits.

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## Chapter 4

# Overcoming Technical, Policy and Affordability Bottlenecks to Scale up Insurance

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**Juan M. Pulhin and Liezl B. Grefalda**

### 4.1 Introduction

The agricultural insurance regime in the Asia-Pacific region is characterized by various types of programs such as the public sector programs of India and the Philippines, public-private partnerships in China and the Republic of Korea, purely private markets in Australia and New Zealand, and non-formal private mutual and community-based crop and livestock initiatives in Bangladesh, India and Nepal (Food and Agriculture Organization of the United Nations, 2011). In spite of this diversity, the current insurance regime in the Asia-Pacific region suffers from various bottlenecks and addressing these issues should be the first step towards an insurance regime that maximizes disaster risk reduction (DRR) and climate change adaptation (CCA) benefits. This requires product innovation and a combination of risk insurance and risk mitigation approaches.

Historically, many government-subsidized agricultural insurance programs, especially in developing countries, have performed poorly because administration costs are generally too high. However, the demand for crop insurance has remained strong, and this is basically driven by the need to improve agricultural competitiveness in increasingly integrated commodity markets (Wenner, 2005). In addition, the effects of climate change augment the

risk exposure of farmers to more frequent and severe adverse natural events. Given these conditions, overcoming the obstacles to better deliver cost-effective and commercially sustainable agricultural insurance products is a difficult challenge.

The purpose of this chapter is to identify the bottlenecks encountered and key issues related to scaling up insurance implemented by both governments and private insurance companies based on the experiences of selected countries. The chapter also provides suggestions on how to resolve issues affecting agricultural insurance and how it can be better implemented. The chapter aims to answer the following questions:

- a. What are the bottlenecks or issues encountered in the implementation of crop insurance in selected Asia-Pacific countries?
- b. Were industry and governments able to reach and benefit the most vulnerable and poor groups, especially when programs were subsidized?
- c. How better can the insurance industry and governments work together to overcome the bottlenecks?

## **4.2 Bottlenecks Encountered**

Despite the advantages and potential benefits of agricultural insurance in developing countries, the number of insured farmers is still small. There are initiatives to promote crop insurance such as subsidies from the government and innovations within the insurance programs. However, technical, policy and affordability issues continue to act as bottlenecks. Addressing these issues would be the first step to enhancing the accessibility of agricultural insurance as a risk management tool to the most vulnerable groups.

### **4.2.1 Technical**

#### **Information problems**

For insurance to be viable, the insurer must have sufficient information about the nature of the risks being insured. However, this becomes very difficult for farm-level yield insurance, as farmers are more knowledgeable about their potential crop yields than the insurers. Thus, insurers cannot correctly classify the type of risk and calculate premium rates that accurately reflect the likelihood of losses for farmers or monitor them effectively (Wenner, 2005).

Under these circumstances, problems of distorted information arise.

Any insurance program faces two critical information problems, i.e. adverse selection and moral hazard. Insurers find it very expensive to differentiate high-risk and low-risk farmers and therefore fail to set appropriate premiums with the risks. The other related information problem is moral hazard, which is a subjective hazard that increases the probable frequency or severity of loss due to the risk insured. Knowing that potential losses are covered, the clients may engage in more risky behavior and may not innovate to minimize production

risks. This problem could lead to possible losses for the insurer since monitoring the behavior of the clients requires high costs.

### High administrative/operating costs

Marketing of crop insurance to the farmers entails huge administrative and operating costs. In the Philippines, the government provides subsidies to support crop insurance programs, but this has not resulted in increased demand for insurance products (e.g. higher penetration rate among farmers) or higher financial returns for insurers.

Hazell (1992) studied the administrative and operational costs of crop insurance. She examined the ratio of paid indemnities to the non-subsidized portion of the premium ( $P$ ) paid by the farmer or the *producer loss ratio* ( $I/P$ ). Table 4.1 shows that  $(I + A)/P$  ratio of more than 1.0 indicates that a program is not collecting adequate premiums from the insured to cover both the indemnities and the administrative costs. As a result, Hazell's study suggested that the crop insurance programs in six countries were not sustainable. It showed that for every dollar in collected premiums paid by producers, the paid indemnities (value of claims) and administrative costs on insurance programs ranged from US\$ 2.40 (in the United States) to US\$ 5.70 (in the Philippines). Estimates of administrative costs, which include marketing and acquisition, incurred by the Philippine Crop Insurance Corporation (PCIC) for crop insurance were as high as 97% of the original gross premium (Mahul and Stutley, 2010). The resulting overhead costs resulted in operational expenses in excess of the premiums collected from farmers. The main reason the insurance programs remain in operation is the huge government financial subsidies.

**Table 4.1. Indemnity and administrative cost compared to premiums among selected countries (in US\$)**

Country	Period	I/P	A/P	(I + A)/P
Brazil	1975-1981	4.29	0.28	4.57
Costa Rica	1970-1989	2.26	0.54	2.8
India	1985-1989	5.11	-	-
Japan	1947-1977	1.48	1.17	2.6
	1985-1989	0.99	3.57	4.56
México	1980-1989	3.18	0.47	3.65
Philippines	1981-1989	3.94	1.8	5.74
USA	1980-1989	1.87	0.55	2.42

Note: I/P=indemnity/premium paid by the producer; A/P=administrative cost/ premium paid by the producer; Sources: By Hazell, 1992 as reported by Skees et al., 1999.

### Low penetration rate

Notwithstanding the high premium subsidies, in the Philippines the penetration rate of the country's agricultural insurance program has been very low, especially for rice and corn. While the penetration rates have improved during the last five years, the figures, particularly for rice, are still way below those of the early 1990s when the penetration rate averaged more

than 10%. At present, the number of rice and corn farmer enrollees/beneficiaries averages around 50,000, which is less than 2% of the 5.2 million estimated number of smallholder farmers in the Philippines (Congressional Policy and Budget Research Department, 2012).

#### **4.2.2 Policy environment**

The implementation of risk insurance programs are governed by the principles of an open market, government policies and regulatory guidelines which act as precursors for a successful insurance sector and ensuring insurance effectiveness (Prabhakar et al., 2013b). Hence, the role of the government is important in promoting the culture of risk mitigation by conducting activities that increase awareness. Also, it is the role of the government to design and implement structural and non-structural disaster risk mitigation codes/laws, which include institutional instruments and favorable regulations.

#### **4.2.3 Affordability**

The issue of affordability limits the extent of risk insurance in the Asia-Pacific region. In the developing countries, most of the income groups still cannot afford the annual insurance premium costs, though insurance premiums in most developing countries are lower than those in developed countries (Prabhakar et al., 2013b).

In the Asia-Pacific region, there is very high government support for crop insurance (Congressional Policy and Budget Research Department, 2012). The common form of support provided by the governments is crop insurance premium subsidies; these exist in eight of the 14 countries which include commercial and pilot crop insurance programs (Congressional Policy and Budget Research Department, 2012) – these include the Philippines, China, Japan, Korea, India, Indonesia, and Pakistan. Reasons given for why the government should intervene in the implementation of crop insurance include: a) poorly developed insurance markets; b) high start-up cost faced by commercial insurers for insurance program development; c) financial capacity constraints faced by the private commercial insurers; d) insurance administration is costly; and e) small and marginal farmers are less able to pay insurance premiums for agricultural crops and livestock (Prabhakar et al., 2013b).

### **4.3 Solutions for Effective Implementation of Agricultural Insurance**

#### **4.3.1 Overcoming adverse selection and moral hazard**

To overcome adverse selection and moral hazard problems, insurers will have to invest heavily in gathering information, especially on farm level yield data over long periods, in

order to appropriately classify the risk. Problems of correlated risks and information asymmetry are likely to make risk pooling, which is an essential element of insurance, ineffective (Congressional Policy and Budget Research Department, 2012).

The traditional problems with agriculture insurance, such as moral hazard, adverse selection and high transaction costs, can be reduced substantially through innovation in the design of the crop insurance scheme. Recent innovative insurance instruments are now being pilot-tested worldwide. Most notable are index-based insurance products designed to address the traditional insurance scheme's operational weaknesses (Food and Agriculture Organization of the United Nations, 2005).

With index-based insurance schemes, estimates of financial losses are based on an index or proxy, instead of using the assessment of an adjuster. The index is based on variables such as regional rainfall, wind speed, temperature and area yields. When the index passes a predetermined critical threshold, the insurance provider starts compensating policy holders for losses. Among these product innovations are:

1. **Weather-based index insurance.** Weather based insurance contracts are linked to a weather index such as volume of rainfall, rather than a possible consequence of weather, such as crop failure. Unlike traditional crop insurance, the insurance provider does not need to visit the coverage area to determine premiums or to assess damages. Instead, the insurance assessment is calculated based on rainfall or other data. When rainfall is the trigger, the insurance provider pays out if the amount of rainfall is below or above the threshold stipulated in the contract.
2. **Area yield-based insurance.** Under area yield-based insurance, a specific area is identified and its historical yield is determined. The insurance provider would then agree to a pre-determined trigger (i.e. a 10% yield decline in the coverage area). If the trigger is met, insured farmers would be paid regardless of the cause.
3. **Crop-revenue products.** This insurance mechanism is designed to meet any loss in revenue from the sales of crops. It aims to protect the client from the consequences of low yields, low prices or a combination of both. The principle of this insurance product is to take into consideration both production and price risk as determinants in the gross revenue of a given crop insured. This is because a production deficit might result in price increase under normal supply/demand conditions.

Not all risks can be covered by index-based insurance schemes. Price fluctuations, unmanageable pests or availability of inputs are difficult risks to insure. Despite these drawbacks, initial results have proven the feasibility and affordability of index-based insurance products (Congressional Policy and Budget Research Department, 2012).

Other than these new insurance products, crop re-insurance is another instrument that allows insurers to access additional risk capital for protection against systemic loss. Without

reinsurance, insurers may not be able to meet the demand for agricultural insurance or may be exposed to default risk. However, due to high cost of reinsurance premiums coupled with the reluctance of reinsurers to train people with the necessary specialized knowledge and information systems to properly monitor and evaluate risks, there is a small market for agricultural reinsurance.

### **4.3.2 Initiatives for reaching the poor and vulnerable groups**

Despite considerable subsidies, industry and governments are not able to deliver insurance to many of the most vulnerable and poorest households in the agricultural sector (Prabhakar et al., 2013a). Partnerships between governments and insurance companies are recognized as necessary in developing new insurance products and improving outreach. As one example of the use of partnerships, Sompo Japan Nipponkoa Risk Management Inc. has been striving to develop insurance products that will contribute to mitigating damage from climate change in cooperation with partners (Saito, 2014). From 2007, Sompo Japan together with the Japan Bank for International Cooperation (JBIC) conducted research on risk financing methods to address climate change. Also, in 2010, Sompo Japan Insurance Thailand started providing weather index insurance in northeast Thailand through the Thai Bank for Agriculture and Agricultural Cooperatives (BAAC), to farmers who had taken BAAC loans. In 2012, sale of the product expanded to cover nine provinces in northeast Thailand. This partnership to deliver weather index insurance was able to bring down the price of premiums and in doing so increase accessibility to the most vulnerable and poorest households engaged in agriculture.

Establishment of strong linkages, at an early phase, with international re-insurers might also be helpful. These companies can provide assistance not only with technical advice, but can also be helpful in ensuring the necessary adherence to correct application of premium setting procedures, and settlement of claims (Roberts, 2005).

### **4.3.3 Optimize the involvement of public and private sectors**

To reduce potential controversies relating to premium settings and claim handlings, the role of the government and public sector (government owned) insurance companies should be carefully considered to ensure the initiative and efficiency of the private sector insurance companies. It is also incumbent on the government to put in place appropriate guidelines for claim settlements and for the insurance companies to educate clients about the claim procedures. For crop insurance to be successful government support is required. This could be in various forms such as subsidization of the insurance premiums, assistance with administrative expenditures, reinsurance, and other kinds of financial support.

Within the region, public sector insurance companies are in fact supported by governments in various forms like: a) paying fully or partly the administration costs; and b) partly sharing the indemnities, or partly paying the premiums to ensure that farmers have the ability to buy insurance. However, there is no direct government support to private sector companies (Sinha and Tripathi, 2014).

To be sure, government support is not always necessary for private insurance companies. For example, in India, private agricultural insurance companies have offered rainfall / weather insurance since 2003-04. This insurance is voluntary and covers specific risks that are insurable. Still, it is worthwhile to encourage greater involvement of the private sector in agriculture insurance by extending to private insurance companies similar government support which is available to the public sector.

#### 4.3.4 Institutionalize insurance policy

Policies related to risk management can be legalized, as is the case of Japan, where the legal responsibility of the government is stipulated by the Basic Act for National Resilience. This reads, “the government has the responsibility to establish and implement measures concerning National Resilience (Article 3)” (Saito, 2014). Consequently, in Japan insurance plays an important role in recovery from disaster and in developing resilience. It provides disaster victims with financial support and assistance to recover their lives. The approach taken by Japan demonstrates the need for the government to closely cooperate with the insurance industry for fulfilling its responsibility.

### 4.4 Conclusions and Recommendations

As it stands, the traditional insurance programs are quite expensive for the insured because of administrative costs, and unresolved adverse selection and moral hazard problems. Several administrative and legislative remedies are necessary to address some of these problems. Further, government is required to ensure that the financial base of the insurer is sound. In many developing countries public sector participation may be needed to ensure a sound financial base (Food and Agriculture Organization of the United Nations, 2011).

The following strategies can be pursued to help mitigate technical deficiencies in traditional crop insurance (Congressional Policy and Budget Research Department, 2012):

1. **Fast-track the pilot-testing of index-based insurance products:** Pilot testing of this alternative to the costly and hard-to-sustain traditional insurance products must be fast-tracked both by the public and private insurance companies. Index-based insurance decreases monitoring and administrative costs since actual losses do not need to be individually assessed and calculated. It can reduce the problem of asymmetrical information since the farmer enrollees/policyholders cannot influence the changes in the index, and both the insurance provider and the insured would know if there is a shift in the index. Pilot testing of various index-based insurance schemes is now necessary to ascertain whether they can reduce moral hazard and eliminate adverse selection problems.
2. **Increase access to the international reinsurance market for affordable and reliable products:** Access to the international reinsurance market is limited among developing countries, particularly in specialized fields such as agricultural insurance. Only schemes

that are properly designed and have rates that generate enough premium volume to cover expected losses, operating costs, and costs of capital are usually accepted. Ways to overcome these problems need to be developed and tested both by the public and private insurance providers.

3. **Governments should provide additional financial support for the development of agricultural risk infrastructure:** Government financial support should not just be in the form of subsidies, but it should also focus on developing agricultural risk management infrastructure, such as enhanced weather and data information, training and education, and research and development. The creation and management of a centralized database of agricultural and weather statistics, and making the database available to agricultural insurance practitioners would be a step in the right direction. Crop insurance, especially index-based insurance schemes, requires a large amount of information to make accurate estimates. Without this information, index-based insurance products cannot be successful. In addition, the availability of good quality data infrastructure creates benefits that extend well beyond individual farmers and insurers.

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## Chapter 5

# Crop Insurance Experiences in Australia, India, the Philippines and Japan

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**Gattineni Srinivasa Rao**

### 5.1 Introduction

It is important to provide a conducive environment to effectively promote insurance that contributes to social objectives. Governments and regulators, through policy decisions that assist in the implementation process of insurance schemes at the national level, are critical. More particularly, for crop insurance, government involvement and well-coordinated policy decisions by the government and regulators and other measures for successful implementation of crop insurance schemes at the national level, is needed. A range of stakeholders including the government, regulators, insurers, reinsurers, brokers, and other service providers, play an important role in identifying and addressing impediments to the scaling up of insurance. There are potentially significant benefits for farmers from these stakeholders addressing specific bottlenecks and providing support for crop insurance through appropriate interventions.

The issue of crop insurance effectiveness was taken up at the regional expert consultation workshop on 4-5 July 2014 at Bangi, Malaysia (see section 1.3 in the background chapter of this report). The workshop discussed the following questions on crop insurance:

1. What are the key issues / impediments limiting crop insurance penetration in the Asia-Pacific region?
2. What are the perceptions of different stakeholders on the current policy environment for promoting insurance in the region?
3. What national level policy measures are necessary for creating an enabling environment for improving crop insurance penetration?

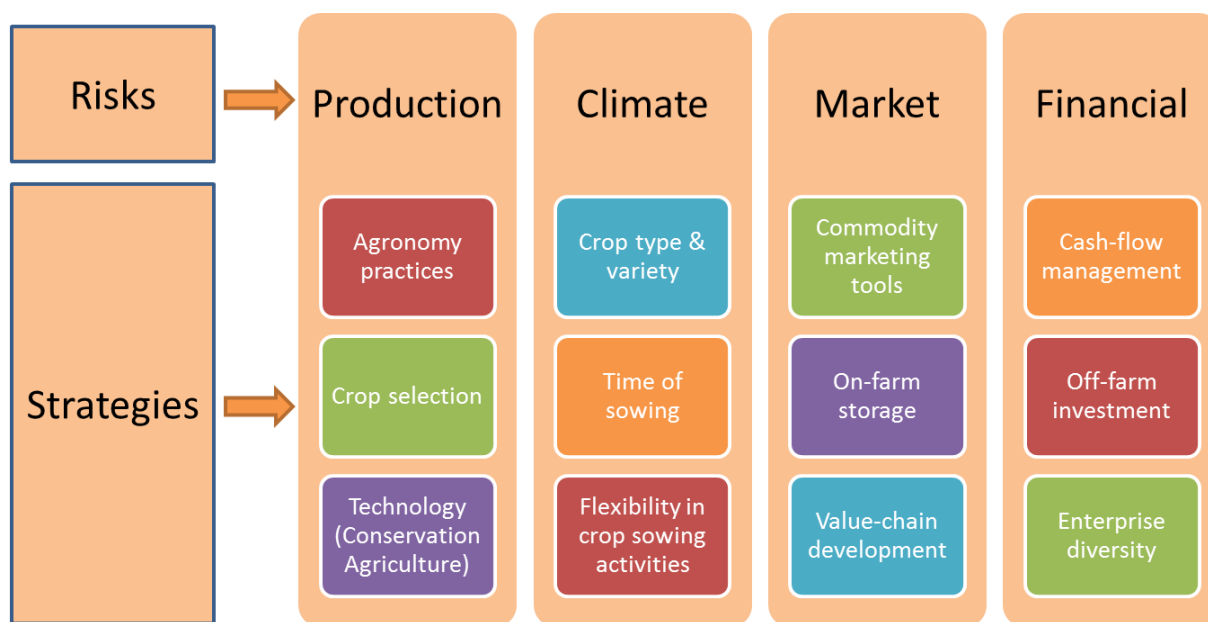
This chapter addresses these questions by reflecting on the discussions at the workshop and a study on farmers' perceptions that employed focused group discussions in Australia and a questionnaire survey of farmers conducted in Japan. The chapter focuses on assessing the effectiveness of policy level initiatives in Australia, India, the Philippines, and Japan. In doing so it develops an understanding on how policy initiatives ensure a conducive environment for the development of agricultural insurance in these countries. This chapter also discusses the strategies for mitigating the agricultural risks that farmers are exposed to, presents a comparison of the quality of the insurance environment between countries, and identifies the characteristics that influence the smooth functioning of crop insurance schemes (particularly in developing markets like India and the Philippines). The chapter also identifies the policy measures required to help resolve issues and improve insurance penetration in the Asia-Pacific region.

The countries covered are the countries selected as case study countries for the APN project (refer to section 1.3 in the background chapter of this report), which this report is part of. The reasons for selecting the countries are as follows. India and the Philippines represent countries with a prominent presence of both government and insurance industry led crop insurance initiatives. Australia represents a developed country where non-subsidized insurance is combined with on-farm risk mitigation strategies that can reduce the cost of insurance. Japan represents a developed country with a long history of subsidized crop insurance implemented in the form of the agriculture mutual aid system.

## **5.2 Crop Insurance Experience in Australia**

Australian farmers face various types of agricultural risks (production risks, market risks, financial risks) due to catastrophic perils. While several risk mitigation strategies are being used to manage these agricultural risks (International Agriculture for Development, 2014), there is a need for additional measures to improve farm level decision making to encourage risk reduction. In addition to the farm level issues, there are product related issues that contribute to the gaps, meaning that new products also need to be developed (International Agriculture for Development, 2014). Risk mitigation strategies include adoption of modern technology and flexible crop management, improved decision making through weather monitoring (e.g. moisture monitoring and rainfall deciles) and multi-peril crop insurance

schemes, etc. A brief outline of the various kinds of risks and the risk mitigation strategies is given below.



**Figure 5.1. Risk classification and mapping of risk management strategies**

Source: International Agriculture for Development, 2014

The focus group discussion studies carried out in Australia indicate that farmers consider it important to define and classify risks into various categories, as this helps their understanding and decision making on mitigation (International Agriculture for Development, 2014). These risks are classified in Figure 5.1. Farmers seem to perceive market risk as a more crucial risk than other risk types listed in Figure 5.1.

A number of observations on farm level risk management in Australia were drawn from the group discussions (International Agriculture for Development, 2014). First, most farmers use modern technologies, including satellite technology for weather monitoring, and flexible crop management, such as growing multiple crops in one season, to manage climate-related agricultural risks. Second, farmers are well informed about various risks including production risks, market risks, insurance risks, and financial risks through various information technologies and sources such as mobile phones, websites, insurers, intermediaries and brokers. Third, farmers have used satellite technologies to identify the risk prone areas in terms of rainfall deficiency and low soil moisture conditions to manage climate risk variations. Fourth, with improved information accessibility, farmers are able to use various technologies and strategies to manage risks, such as obtaining real time prices, storing grain on their farms, and using modern risk hedging mechanisms like weather or commodity derivatives. Fifth, most farmers have good knowledge about insurance and with this knowledge currently prefer integrated insurance solutions such as multi-peril crop insurance.

On the whole, the study found that compared to traditional yield insurance products, index-based products show more promise, and unlike in developing countries, policy makers are not so interested in supporting government-subsidized insurance (International Agriculture for Development, 2014). The study also observed that alternative options available for Australian farmers to manage price risk include strengthening forward contracting and on-farm storage of grain.

While Australia has made significant progress in making farm level risk management solutions available to farmers, the extent to which these solutions have enabled farmers to minimize financial losses from shocks is unclear. There is a need for quantitative indicators that can be used to measure the costs and benefits of insurance programs in Australia in mitigating catastrophic crop risks.

### 5.3 Crop Insurance Experience in India

India has a rich experience of implementing national level crop insurance programs that have been designed to help farmers minimize risks emanating from climatic hazards. Some of these national programs are the Comprehensive Crop Insurance Scheme (CCIS; 1985), National Agricultural Insurance Scheme (NAIS; 1999), The Weather Based Crop Insurance Scheme (WBCIS; 2007-08) and the Modified National Agricultural Insurance Scheme (MNAIS; 2010-11). This experience has indicated the need to address the following key issues (Rao, 2014).

**Discrepancy in area insured:** A discrepancy between the area insured and the crop area sown, where the former is greater than the latter, exists. This arises mainly because of the design of the area-based crop insurance schemes and deficiencies in the system of assessment of crop areas by the government agencies, namely a lack of scrutiny by banks in preventing multiple insurance policies for the same land and verifying that the crop loan was used for intended purpose by the farmers. The problem can be avoided by using General Packet Radio Service (GPRS)-enabled satellite data and camera-fitted mobile phones or hand-held devices that can capture the image of area under cultivation including the type of crops sown and growth stage of the crop, along with land record details of the farmers.

**Crop cutting experiments (CCEs):** CCEs are used to generate yield data based on yields measured from observation units (usually a square meter per farmer) selected at random in a given administrative unit such as village or district. The main issues relate to the inaccuracy of this methodology, as often there are a lesser number of CCEs undertaken in the field than are required to provide an accurate assessment. This results in inadequate and unreliable yield data. There are also issues relating to delays in the CCE data being forwarded to the insurers by the field assessors, resulting in delays in the settlement of claims.

**Weather data:** Data on weather is collected from private providers through automatic weather stations (AWS), but this data is often unreliable and inconsistent. Significant differences between the actual rainfall areas and the catchment radius of AWS, and lack of accreditation, certification and quality control mechanism all affect the availability of reliable weather data to the insurers, which can lead to delays in the settlement of claims. Here, the use of satellite data synthesized with AWS readings on key weather parameters (such as rainfall, temperature, moisture and wind velocity) could help in improving the quality of weather data.

**Crop loan practices:** It has been observed that the procedures followed in the granting of crop loans do not conform to the principles and guidelines of crop insurance schemes. This can result in an abnormal increase in the disbursement of loans towards the cut-off date for such schemes. In most seasons, the state government extends the cut-off dates for insurance beyond the beginning of the season, which results in disparity in farmers being selected and an overall lack of equity. This can be mitigated by streamlining the credit delivery system across the country and having mechanisms in place that can validate data and observations, such as the use of technology to link the data of the planted areas with bank records and insurance policies. A centralized web portal linking the servers of banks, insurance companies and the government’s revenue department would help in resolving this issue to a large extent. Such an innovation is being implemented by eeMausam Weather Risk Management Services in India (Figure 5.2).

The screenshot shows a web interface for a crop insurance system. At the top, it says 'CROP INSURANCE SYSTEM' and 'Welcome AIC | Logout'. Below that are navigation tabs for 'Registrations', 'Claims', 'Views', and 'Users'. A filter section allows users to choose by 'State', 'District', or 'Village'. The main content is a table with 10 rows of farmer registration data. Each row includes a serial number, registration ID, name, crop type, mobile number, total sum insured, total premium, registered time, and links to view details and images.

Sno	Registration Id	Name	Crop	Mobile	Total SumInsured	Total Premium	Registered Time	View Details	View Images
1	ATPKPL00	L.Giriappa	Groundnut		2750	965	8/12/2013 11:28:40 PM	<a href="#">View Details</a>	<a href="#">View Images</a>
2	ATPKPL00	M.Vannurappa	Groundnut		2750	193	8/12/2013 11:38:19 PM	<a href="#">View Details</a>	<a href="#">View Images</a>
3	ATPKPL00	K.Gajamma	Groundnut		2750	579	8/12/2013 11:50:06 PM	<a href="#">View Details</a>	<a href="#">View Images</a>
4	ATPKPL00	Y.C.Nagamani	Groundnut		2750	386	8/12/2013 11:58:00 PM	<a href="#">View Details</a>	<a href="#">View Images</a>
5	ATPKPL	K.Yallappa	Groundnut		2750	386	8/12/2013 8:30:12 AM	<a href="#">View Details</a>	<a href="#">View Images</a>
6	ATPKPL	L.Kariyanna	Groundnut		2750	579	8/12/2013 8:49:47 AM	<a href="#">View Details</a>	<a href="#">View Images</a>
7	ATPKPL	B.Laxmikanthama	Groundnut		2750	193	8/13/2013 11:34:31 PM	<a href="#">View Details</a>	<a href="#">View Images</a>
8	ATPKPL	C.Machhanna	Groundnut		2750	193	8/13/2013 11:41:27 PM	<a href="#">View Details</a>	<a href="#">View Images</a>
9	ATPKPL	Y.Pollakka	Groundnut		2750	386	8/13/2013 11:48:18 PM	<a href="#">View Details</a>	<a href="#">View Images</a>
10	ATPKPL	Y.Malamma	Groundnut		2750	579	8/13/2013 11:53:54 PM	<a href="#">View Details</a>	<a href="#">View Images</a>

**Figure 5.2. Web interface showing the details of the farmers insured**

Source: Rao, 2014

**Technical skills and capacity building:** The lack of technical skills of field staff involved in the delivery of crop insurance products and services, including within the weather data service providers and government departments, is leading to great discrepancy in accessibility and delivery of insurance products and services to the farmers. Establishing a well-

coordinated network of training units at state level could raise the level of technical competency, providing consistency and clarity in the delivery of services to farmers.

**Low awareness among the farmers:** The current adoption levels of improved agriculture practices are very low, exposing vulnerable farmers to natural hazards. There is widespread lack of knowledge about crop insurance schemes among farmers and many farmers are not aware that crop insurance is mandatory to obtain a crop loan. They also have little or no knowledge about the coverage and the amount of premium being deducted from their crop loan (Rao, 2014). To address this issue, the introduction of training and capacity building programs targeting farmers would provide significant benefits.

**Product design:** There are no customized or innovative products available in the market that address variations in weather conditions and crop types in India. At present, there are either single peril policies or a few parametric or index based products available. The yield based products that are available are unsuitable for many horticultural crops and vegetables. The reason for this is that the ‘trigger points’ for claiming insurance benefits do not capture the variations across different regions and crops. As a result, the weather parameters used as triggers often do not reflect the actual losses suffered by the farmers. Hence, it can be suggested that the product design of agriculture insurance schemes should match with the agro climate zones, types and nature of crops and different stages of the crop cycle (Rao, 2014).

**Settlement of claims:** Delays in the settlement of insurance claims are considered to be a major barrier for the development of suitable insurance programs in India. Delays in claim settlements have diminished the value of insurance for farmers and caused them to accumulate debt with financial institutions and local moneylenders. Important factors contributing to the delay in insurance settlements are: delayed receipt of weather or yield data; inadequacy and inaccuracy of data; involvement of multiple agencies or intermediaries or third party service providers; and area discrepancies in weather and yield data. Introducing innovative products like multi-peril<sup>4</sup> or double trigger<sup>5</sup> index based products can facilitate the early payment of claims (as they can be paid based on availability of any of the insured triggers). Further, a minimum standard specified time limit (such as 1, 2 or 3 months from the date of receipt of weather or yield data) should be made mandatory for the settlement of claims.

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<sup>4</sup> Multi-peril insurance covers more than a single peril, such as droughts, floods, typhoons, etc. in a single insurance product.

<sup>5</sup> Index insurance products could be designed with a single trigger (e.g. reduced rainfall of a specific amount) or can combine several triggers (e.g. rainfall of a specific amount at specific periods of the crop cycle accompanied by specific loss of crop yield).



## 5.4 Agriculture Insurance in the Philippines

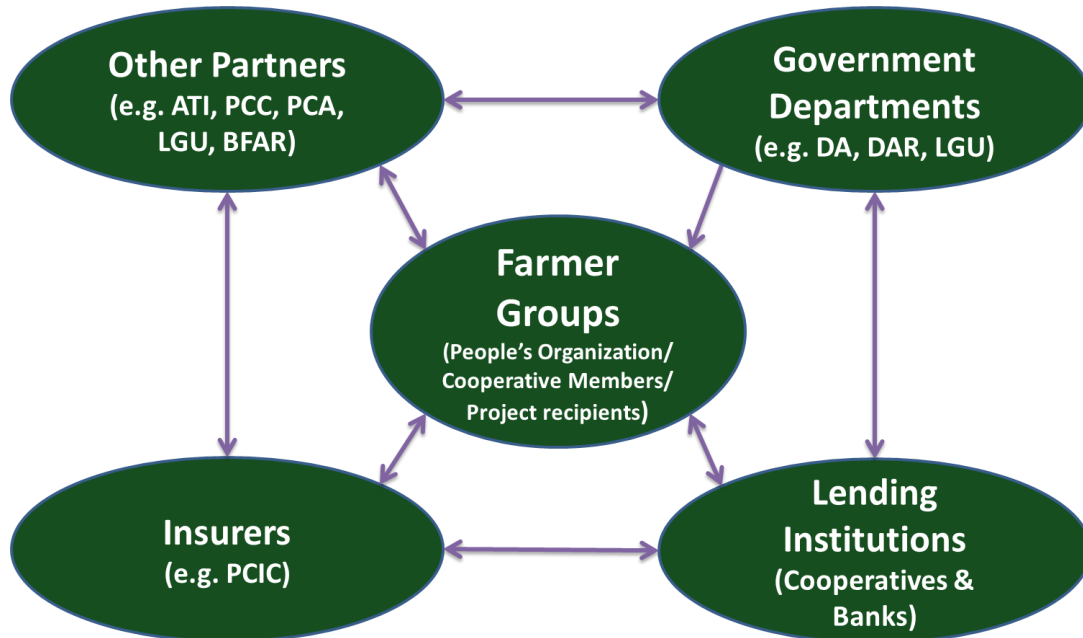
The Philippines has a sizeable population that is dependent on agriculture and fisheries industries for their livelihoods. It is one of the most vulnerable countries to natural catastrophic perils, such as floods, cyclones, earthquakes and volcanic eruptions (Pulhin and Grefalda, 2014). An enabling environment in which crop insurance as a risk mitigation tool for climate change and catastrophic perils can flourish is thus important.

Among the many forms of insurance tested in Philippines, community-based insurance schemes have an important role to play in the rural sector as they cover the risks of a range of agricultural stakeholder groups, including community groups, cooperatives and other 'people's organizations'. The key actors in community-based insurance are the insurers (e.g. the Philippine's Crop Insurance Corporation (PCIC) and other private actors), the government, farmer groups including farmer cooperatives, and other organizations including the Agriculture Training Institute, Philippine Carabao Center, Philippine Coconut Authority, Local Government Units, Bureau of Fisheries and Aquatic Resources, and lending institutions, i.e. banks and financial cooperatives (Figure 5.3).

There are several advantages of community-based insurance schemes (Pulhin and Grefalda, 2014). Generally, they are associated with very low moral hazard levels and minimal discrimination in selection, and a lower incidence of fraud and abuse of claims. As a result, the community-based insurance schemes are able to play a vital role in raising financial resources that can be used for improving the socio-economic condition of the community. Community-based insurance is more widely accessible to agricultural communities than other schemes, reaches more members of local groups or organizations and can offer lower premium rates. Community-based insurance schemes are thought to be more efficiently managed than alternatives, resulting in improved cost-benefit ratios for end users, lower transaction costs and less labor input. Most importantly, the community-based insurance schemes provide an important risk mitigation tool for the socially weaker sections or low income group of customers.

Despite their advantages, community-based insurance schemes in the Philippines face challenges associated with being in an early stage of development. These challenges include low levels of farmer awareness of these schemes, though gradually awareness is growing, and this is reflected in increased demand for community-based insurance. Currently, the amount of available research literature describing the insurance schemes is low. Insurers find it challenging to be able to develop well-integrated schemes that can be successfully promoted and adopted by farmers. Additional challenges include a low level of awareness and product knowledge among the intermediaries (i.e. agents selling the insurance) compared with traditional insurance schemes. Though premiums are relatively low, they are still beyond the

reach of many farmers and economically disadvantaged groups. Thought should be given to how premiums can be reduced, either through premium subsidies (from government or insurance companies reducing their profit margins) or through lending institutions (the co-operatives / NGOs) passing on their share of revenue (commissions) to their member borrowers, which can help in reducing the cost of premium to their members.



**Figure 5.3. Institutional structure of insurance in Philippines**

Source: Adopted from Pulhin and Grefalda, 2014

There are several opportunities for promoting community-based insurance approaches. Index based insurance avoids some of the operational weaknesses of more traditional products, though the sustainability of index based insurance is yet to be proven. Delivering innovative forms of index based insurance through community-based schemes could make this type of insurance more widely available to farmers. The government can facilitate this process by ensuring that adequate technical expertise is available in the country to build awareness and develop more innovative products, such as parametric based insurance, weather index based insurance and multi-peril crop insurance. Also, government support for the promotion of public private partnerships (PPP) especially in agriculture (i.e. the private sector in partnership with PCICI) would help in improving insurance penetration among economically disadvantaged groups. Further, as part of its CCA and DRR strategies, the government could consider the creation of national policy to promote agricultural insurance (Pulhin and Grefalda, 2014).

## 5.5 Crop Insurance Experience in Japan

Japan is vulnerable to catastrophic climate-related perils such as cyclones, storms, typhoons, high and low temperature events, and droughts, as well as non-climate perils, such as tsunami and earthquakes. Typhoons, drought and low temperature are the major agricultural catastrophic perils that have historically affected farmers most in Japan (Prabhakar and Ozawa, 2014).

To address these losses, the government of Japan has made several efforts to strengthen crop insurance, with NOSAI (*Nogyo Kyosai*; the Agriculture Mutual Aid System) playing an important role. NOSAI was established under the Agriculture Natural Disaster Compensation Law 1947, with a view to mitigating the impact of disasters and thereby stabilizing agriculture income, leading to the growth of Japanese agriculture (Prabhakar and Ozawa, 2014). NOSAI provides a multi-peril crop insurance scheme and currently covers a total of three million policyholders.

NOSAI is a mutual aid system operated by the Agriculture Mutual Relief Associations (AMRs) that exist in almost all municipalities. It operates according to the risk pooling system, where the money generated from the premium is used to pay insurance claims to the farmers upon the occurrence of an insured disaster or peril. NOSAI has a three-tier structure. At the bottom tier, the AMRs provide direct insurance to the farmers. AMRs are involved in collecting the premium directly from the farmers and provide indemnities to those who are affected by the insured perils. In the middle tier, the Prefectural Federation of AMRs acts like reinsurers, and the top tier consists of the Ministry of Agriculture, Forestry and Fisheries of Japan, which serves as reinsurance underwriter to the federations and subsidizes premiums. In order to support the ARMs or the federation's swift payment of claims, the Agricultural, Forestry and Fisheries Credit Foundation lends indemnity money or give credit guarantee to the ARMs or the federation in the case of its fund shortage (Saito, 2014).

NOSAI has offered a wide range of agriculture insurance products, from rice insurance, fruit and fruit-tree insurance, and green house insurance to a multi crop insurance scheme covering nearly 2.4 million farmers in Japan (Prabhakar and Ozawa, 2014). The overall experience of agriculture insurance in Japan is positive with a loss ratio of less than 100%; total premiums collected amount to 24,183 million yen and the claim liability amounts to nearly 20 billion yen. Although the overall loss ratio of agriculture insurance in Japan is less than 100%, not all indicators of insurance performance are positive. Both the number of farmers covered and the growth of premiums have declined dramatically over the last 20 years. The reasons for this are not clear. One possibility is that there might have been an overall decline in agriculture risk. These issues deserve further study.

To understand farmers' perceptions about agriculture insurance and how these are related to farmers' perceptions of risks, available products, premiums, premium subsidies, claims

settlement processes, and benefits of agriculture insurance, a survey was conducted in Okinawa prefecture targeting farmers, NOSAI staff, and prefectural government officials (Prabhakar and Ozawa, 2014). The surveyed farmers were primarily men involved in full time farming. Nearly 53% were in the age group 60-70 years and the rest were between 40-60 years. Forty-seven per cent of the farmers own on average 4 ha of land and the rest have around 1-3 ha. Thirty-seven per cent of the farmers had an annual income of 10 million yen or more; 27% of those interviewed did not disclose their income. Nearly 94% of the farmers had received some kind of farm subsidy, other than an insurance premium subsidy. All the farmers had participating in insurance for several years.

Of the surveyed farmers, nearly 90% felt that insurance is necessary for recovering from crop loss and perceived it as a good policy for the government to implement. Interestingly, nearly 57% of the farmers considered that there were no loopholes with the insurance claim procedures, whilst 30% felt that the loss damage assessment was unsatisfactory. Many farmers seemed to have been satisfied with the claim settlement process as nearly 57% had received their insurance claims within 3 months (with others receiving claims sooner). Some 83% of the farmers perceived that their insurance claims were received in time, helping them to recover from the disaster. Most farmers felt that the loss or damage assessment was fair and satisfactory. Nearly 43% were of the opinion that the insurance claim payment could help them recover mostly from the disaster while 30% felt that they could recover fully and 10% could not recover at all.

Regarding the premium subsidy, most farmers felt that the current level of subsidy was sufficient while 37% were of the opinion that it needed to be increased. None of the farmers favored the removal of the premium subsidy. Hence, the subsidy may have played a major role in making the insurance an attractive incentive for farmers to take up the insurance scheme. Interestingly, no major issues regarding moral hazard or anti-selection issues were reported either by the farmers or by the insurers. Another finding was that farmers strongly preferred indemnity based insurance products - as it was found that the loss ratio is also less than 100%. Hence, there is considerable resistance from farmers towards changing from indemnity based products to weather based insurance or index based products.

## **5.6 Conclusions**

The initiatives by the government, insurers, mutual aid organizers, and stakeholder organizations in the Australia and the Philippines and NOSAI in Japan have played crucial roles in helping to build a conducive environment for insurance. Key elements supporting the uptake of agricultural insurance include the provision of necessary support by way of better coordination, regular monitoring of the service providers including the insurers, reinsurers, third party agencies, information providers, etc., ensuring appropriate products are in place, and the availability of weather data in a timely manner (enabling the insurers to settle claims

in a timely manner) and the accessibility of this data to farmers. A customer-friendly environment for insurance in developed markets such as Japan and Australia has helped to increase uptake by farmers, in contrast to India and the Philippines where the market is less developed and uptake rates are lower.

There are shortcomings in the insurance sector that diminish the benefits for farmers even if they have access to such insurance, especially in developing countries. These are associated with the products, data availability, loss assessment processes, and the receipt of claims. The products are mostly either traditional yield based products or single peril driven. As a result, as weather based products, they do not capture all the risks that farmers are exposed to, such as market risk and revenue risk, and even production risks are not fully covered. There is a huge gap between the actual financial loss and the insured claim and delays in getting the claims, which has made these existing insurance products unattractive to farmers. That the premium rates of crop insurance products including weather based insurance are perceived by farmers as unaffordable has also acted as a barrier to their uptake. Another problem for the agriculture insurance market in developing countries such as India and the Philippines is low farmer awareness of insurance. This is most prevalent in India where often farmers are not even aware of their own insurance coverage and claim settlements, since claims are often directly settled between the insurance companies and the banks (who had lent the crop loans to the farmers).

These findings on the impediments that are hindering the functioning of crop insurance programs indicate a need for policy interventions and well-coordinated efforts from all the key stakeholders, with a view to creating a conducive environment for agriculture insurance characterized by innovative products and the speedy delivery of policy services capable of mitigating agriculture risks faced by farmers. The larger aim is to reduce financial losses from shocks experienced by farmers, leading to improved quality of life and better awareness about climate change adaptability in the years to come. Addressing these traditional insurance issues should be a priority to enable insurance to deliver even its basic minimum objectives.

The experiences reviewed in this chapter do not provide sufficient evidence of whether or not the current insurance experiences have enabled farmers to improve long-term risk mitigation in terms of DRR and CCA. The case studies to be conducted in the subsequent year of the APN project referred to in the objective section of the Background Chapter in this report will help to investigate this question.

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## Chapter 6

# The Role, Challenges and Ways Forward for NGOs as Providers of Agricultural Insurance

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Henry Scheyvens

### 6.1 Introduction

Non-governmental organizations (NGOs) appear to have several strengths that in some contexts may make them a more suitable conduit for delivering agricultural insurance to poor farming households than regular commercial providers of insurance. First, the basic mandate of development-oriented NGOs is to alleviate poverty, rather than to generate profits. This enables them to explore non-traditional insurance products and delivery modes in contexts where households are unfamiliar with the workings of formal insurance, ability to pay premiums is low, average losses insured are small, and claim frequency is likely to be high. Second, in some countries NGOs that provide microfinance services (NGO-MFIs) have a well-established presence in rural communities through their field offices and weekly face-to-face meetings with their members. Their savings and loans products are generally considered reliable and not susceptible to the charging of illegal fees or other forms of corruption (Werner, 2009). Third, many NGO-MFIs have a history of experimentation in service design

and delivery, and thus have the organizational disposition necessary for innovation in agricultural insurance.

These observations that suggest that NGOs could play important roles in agricultural insurance delivery led to one session being specifically dedicated to this issue at the expert consultation workshop ‘Evidence for Disaster Risk Reduction and Climate Change Adaptation Effectiveness of Insurance: Challenges and Opportunities’, 4-5 July 2014, Bangi, Malaysia. As part of the preparation for this session, participants were asked to reflect on the following questions with respect to the involvement of NGOs in agricultural insurance delivery:

- How were the insurance products made affordable for the most poor and vulnerable households?
- Can these experiences be scaled up and, if so, how?
- How was insurance effectiveness assessed, monitored and evaluated?

During the session the participants also discussed a fourth question that is of particular interest to the APN project that this report is part of, namely: What indicators should be used for assessing agricultural insurance effectiveness? The following discussion draws on the information and ideas shared at the workshop as well as a literature review in attempting to provide answers to these four questions.

## **6.2 How Were the Insurance Products Made Affordable for the Most Poor and Vulnerable Households?**

The workshop discussed several examples from India, Bangladesh and the Philippines of NGOs that have succeeded in delivering agricultural insurance to relatively poor rural households. Key features of the schemes and the reasons for their achievements are discussed below.

### **6.2.1 DHAN foundation support for insurance through village mutuals<sup>6</sup>**

The DHAN Foundation works with about 200,000 farming households in India through its tankfed agriculture, coastal agriculture and rainfed agriculture programs. It has supported insurance interventions since 1997 and introduced crop insurance in 2003.

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<sup>6</sup> The information in this section is mostly from Balasubramanian, S. 2014. Climate Risk Mitigation Through Rainfall Indexed Crop Insurance. Paper Presented at Regional Consultation Workshop on Evidence for Disaster Risk Reduction and Climate Change Adaptation Effectiveness of Insurance: Challenges and Opportunities, Bangi, Malaysia, 4-5 July 2014. Bangi, Malaysia: IGES-SEADPRI-eeMausam-IAFD-UPLB.



DHAN started piloting rainfall indexed crop insurance through a private insurance company, but faced a number of challenges including the need for (i) data at a fine scale to reflect high spatial variability in rainfall, (ii) customized policies on a micro scale, and (iii) insurance products that adequately capture the relationship between crop performance and rainfall. To meet these challenges, DHAN turned to village mutuals as the insurance providers and developed a sophisticated insurance product that reduces premiums for farmers who implement specified risk mitigation measures, captures rainfall variation at a fine scale and incorporates a number of payout triggers that make good sense to farmers.

DHAN found community mutuals to be more appropriate conduits for insurance to smallholders than private insurance companies. The mutuals are run by representatives elected by the farmers and are both the insurers and insured. They are able to identify payout triggers that are closely correlated with productivity at the local scale, e.g. the amount of rainfall recorded by gauges at critical periods in the cropping cycle, with the onset of the monsoon used as a dynamic start date. To reduce spatial risk, rain gauges were installed in 158 villages with an average coverage of 5 km<sup>2</sup> radius, while product basis risk is addressed through intensive insurance education using simple, effective methods; about two months prior to the monsoon the insurance is promoted in the communities through posters, farmers meetings, megaphone announcements and community radio programs. The insurance is also attractive to mutual members as enrolment processes are kept simple with no requirement for presentation of land records, claims are settled within one month and any disagreements are handled by the mutuals' conflict resolution mechanisms. DHAN keeps the operation costs to a minimum by 'piggybacking' the insurance on its rural outreach programs.

### **6.2.2 Livestock insurance in Bangladesh (complete service model)**

Some encouraging results are emerging from the delivery of livestock insurance by NGO-MFIs in Bangladesh.<sup>7</sup> The NGO-MFIs provide loans to rural households for livestock purchase and couple the loans with insurance, which they underwrite (complete service model). Veterinary services are provided as part of the loan – insurance package and this combination has been found to be a key to reducing risks and increasing returns. SOJAG, an NGO-MFI that employs its own veterinarians, was able to reduce the mortality rate of cattle to 0.5% (compared with a national average of about 5%), enabling it to keep its insurance premium at 1% of the loan amount.<sup>8</sup>

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<sup>7</sup> Bangladesh's overall experience with agricultural insurance is limited and has not been so positive (Ahmed 2010). Problems experienced by the state-owned insurance company Shadharan Bima Corporation (SBC), which was the only mainstream agricultural insurance provider in the country in the 1980s and 1990s, included a lack of (i) strategic plans and road maps, (ii) technical knowledge on livestock and crop insurance, (iii) connection between scheme controllers and smallholders, and (iv) a refined process to determine premiums and payouts (ibid.).

<sup>8</sup> Interviews with SOJAG officers, 26 Aug. 2013.

### 6.2.3 MicroEnsure in the Philippines (intermediary brokerage model)

MicroEnsure was launched in 2007 in the Philippines, where it now operates in over 50 provinces (Martirez, 2014).<sup>9</sup> As an insurance broker, MicroEnsure acts as an intermediary that sits between the risk carriers (underwriters, reinsurers, etc.) and the distribution agents (development organisations, trade unions, faith-based networks, etc.). It designs the insurance products, provides training on outreach, handles all data entry and reporting, and processes claims.

MicroEnsure has been particularly innovative with agricultural insurance products. It works with a large microfinance bank to provide weather index insurance packaged with cover for flood, pests and diseases, and has issued over nine million policies. It also offers typhoon index insurance, which pays out according to the distance and intensity of the typhoon that passed the area. The claim is automatically calculated using data captured by the Japanese Meteorological Authority. This choice of data provides transparency as it is freely available through the Internet. MicroEnsure has also launched a “Wet and dry-day” product that insures the cost of cultivation against the peril of continuously wet or dry days during a specified cover period. The parametric trigger used is the amount of rainfall measured by a weather station within twenty kilometers from the farmer’s field. “Input Linked Based Insurance”, a combined personal accident and weather index insurance product linked to the purchase of fertilizer bags, is also offered. For each bag of fertilizer purchased, the farmer is registered for a weather index insurance plan that provides a discount on future purchases in the event of adverse weather, as well as for a personal accident plan.

### 6.2.4 Strategies to keep costs affordable

The three NGOs used various strategies to keep the costs of insurance affordable for poor farmers. These included:

- Reducing premiums for farmers who implemented specific risk mitigation measures to reduce the likelihood of crop losses (DHAN);
- Reducing administration costs by linking insurance delivery with existing village-level programs (DHAN, NGO-MFIs in Bangladesh and MicroEnsure);
- Reducing administration costs by offering various weather-based index insurance products (DHAN and MicroEnsure);
- Making the costs of some insurance products less ‘conspicuous’ by embedding them in the cost of input purchases (NGO-MFIs in Bangladesh linked the costs of livestock

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<sup>9</sup> The information in this section is mostly from Martirez, W.H. 2014. Effectiveness of microinsurance programs in Philippines: Metrics used for measuring the effectiveness by MicroEnsure. Paper presented at Regional Consultation Workshop on Evidence for Disaster Risk Reduction and Climate Change Adaptation Effectiveness of Insurance: Challenges and Opportunities, Bangi, Malaysia, 4-5 July 2014. Bangi, Malaysia: IGES-SEADPRI-eeMausam-IAFD-UPLB.

insurance with the loans they provided for livestock purchase, and MicroEnsure embedded insurance costs in the purchase price of fertilizer bags).

## **6.3 Can These Experiences be Scaled Up and, if so, How?**

There appears to be potential for scaling up these approaches, as the NGOs have been able to overcome many of the traditional obstacles that confront the delivery of insurance products to poor agrarian households. They have been able to overcome the problem of cost to some extent through the various strategies described above. They have been able to overcome the lack of awareness and mistrust local people have of formal insurance by bringing insurance services to their doorsteps. Having trust relationships and good reputations with the communities has been an advantage. Further, by working closely with farmers they have been able to design and offer finely-tuned insurance products that reflect the real risks those farmers face. And, they have invested in data collection for weather-based index insurance at an appropriate scale, meaning that payouts are more likely to reflect the actual losses that farmers experience.

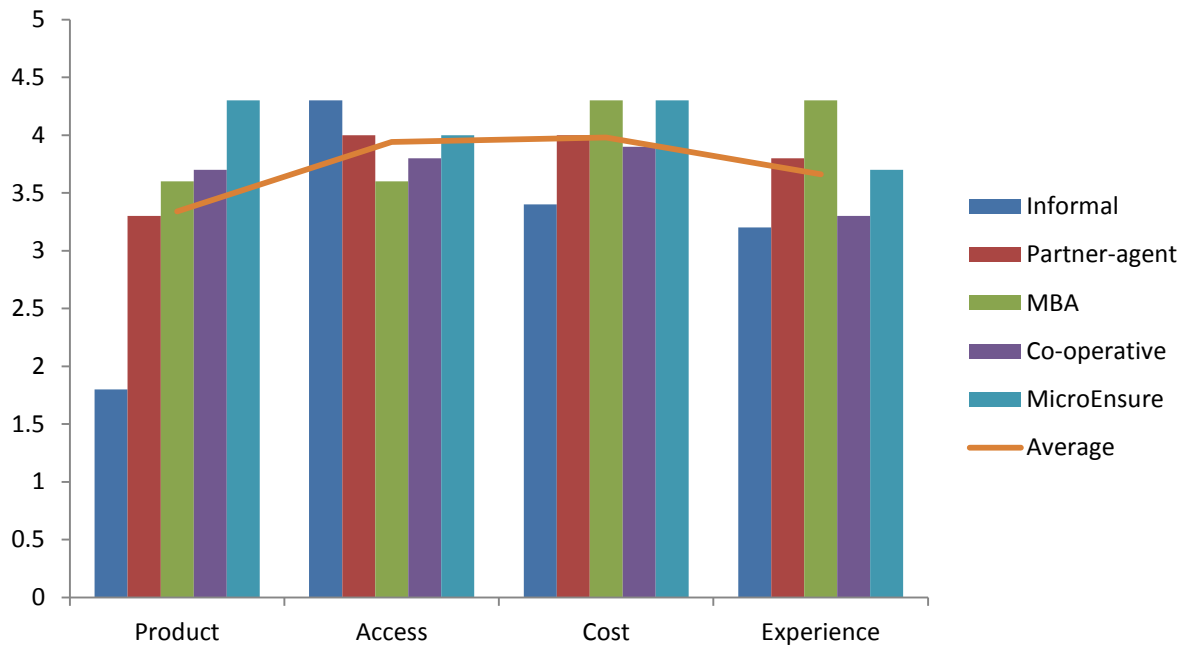
How can scaling up take place? In Bangladesh, the large NGO-MFIs are already active in most villages of the country so they have the necessary infrastructure in place to scale up successful insurance pilots. MicroEnsure, on the other hand, can scale up successful pilots by increasing the number of NGOs and other local organizations that it engages in insurance delivery.

However, there may be obstacles that need to be overcome before scaling up can take place. For example, NGO-MFIs in Bangladesh do not have access to reinsurance and this makes them vulnerable to catastrophic risks. As an alternative to reinsurance, the Palli Karma-Sahayak Foundation (PKSF), an MFI apex body, has created a Covariant Risk Fund, with a start-up fund of BDT 50 million (Karim, 2014). Developing a customized management information system for microinsurance is another priority, which will require investment in the development of software and training (ibid.). The use of village mutuals to deliver insurance, as in the approach taken by DHAN, will also have to overcome a number of problems, including constraints that can occur with governance, capacity, capital reserves and regulations (Churchill and Matul, 2012).

## **6.4 How was Insurance Effectiveness Assessed, Monitored and Evaluated?**

Studies on insurance effectiveness have been conducted for both DHAN and MicroEnsure. In both cases the International Labor Organization's Microinsurance Innovation Facility's PACE (Product, Access, Cost and Experience) tool was used.<sup>9</sup> DHAN considers its insurance

program to be successful based on the fact that the PACE tool assessed its client value higher than that of mainstream rainfall insurance programs. It also cites an 88% renewal rate by the village mutuals as an indicator of success. MicroEnsure also rates its performance highly using the results of a PACE study. The PACE study found MicroEnsure to mostly outperform informal providers, partner-agent models, cooperative insurance, and the Mutual Benefit Associations (MBAs) (Figure 6.1).<sup>9</sup>



**Figure 6.1. PACE scores for selected microinsurance providers in the Philippines**

## 6.5 What Indicators Should be Used for Assessing Agricultural Insurance Effectiveness?

Agricultural insurance for poor rural households is most effective when it helps households deal with the actual risks they face. However, as illustrated by the use of the PACE tool to assess the effectiveness of the insurance services of DHAN Foundation and MicroEnsure, the discussion on effectiveness in the literature is mostly limited to the performance of the microinsurance providers and client satisfaction, with less attention given to insurance impacts on household investment decisions and wellbeing.

Some indicators commonly used in insurance effectiveness assessments do have relevance to household wellbeing, including premium paid versus payout, percentage of loss insured, claim settlement period, and claims acceptance/rejection ratio. However, more direct indicators of household wellbeing and economic trajectory are needed for a comprehensive

understanding of the effectiveness of insurance as a risk mitigation tool for poor rural households.

A set of indicators is proposed in Table 6.1 that would help in evaluating the impacts of agricultural insurance on sustainable development, disaster risk reduction and climate change adaptation. The indicators are specified at household, scheme and national levels, and are based on a *dynamic* rather than a *static* conceptualization of poverty. The former considers how household wellbeing changes over time, whereas the latter focuses on wellbeing at one point in time. A dynamic conceptualization of poverty is needed to reflect the fact that climate-related and idiosyncratic shocks have immense influence on the economic trajectories of poor households. The loss of crops, livestock, land and human capital (through death or illness) can quickly move a household from above to below the poverty line, or a household just below the poverty line into a state of chronic poverty (Osmani and Sen, 2010).

**Table 6.1. Proposed indicators for assessing the effectiveness of risk insurance for the rural poor**

Level	Indicator	Notes
<b>Household</b>	Proportion of loss from shock covered by pay out	In some cases, (e.g. micro-health insurance in Bangladesh), the insurance only covers part of the costs incurred. Co-payment is used because the full costs incurred are too high for the insurer to cover. For the household, the key issue is whether the co-payment causes them financial distress.
	Proportion of total losses per year from shocks covered by pay outs	A household could incur a range of crop losses in one year, but might only have insurance for one or a few crops, and in the case of weather-based index insurance, the insured triggers may not fully reflect the actual risks responsible for losses.
	Avoided distress sale of assets (value thereof)	Distress sale of productive assets as a coping strategy may be avoided if timely insurance payments are received
	Avoided draw down of savings	Ditto
	Avoided borrowing (principal and interest) from moneylenders	Ditto
	Consumption smoothing	Poor households may be forced to reduce their consumption during difficult periods, e.g. long flood periods and droughts. Insurance could have a consumption smoothing effect by pay outs made during these difficult periods enabling households to avoid reducing food intake.
	Reduced frequency and amount of losses	When insurance is packaged with other support (e.g. veterinary services in the case of cattle insurance, or basic health education in the case of health insurance), the likelihood of loss may decline.

Level	Indicator	Notes
	Increased productivity of livelihood strategies	Insurance might encourage households to take on risks to improve their wellbeing that they would otherwise have avoided without the insurance. For example, poor households may feel more inclined to take loans from microfinance institutions when they are packaged with credit-life insurance.
	Reduced anxiety	Self-explanatory
	Reduced social stigma	Insured households incurring losses may have less need to plead for assistance from relatives.
<b>Scheme</b>	Percentage of households participating in the scheme that are extreme, hard core or chronic poor	Poverty alleviation programs often show special concern for poor households who experience very severe poverty and have little opportunity of escaping it through their own efforts. These households are referred to as extreme, hard core or chronic poor. The poorest households have the least ability to pay insurance premiums yet have the greatest potential to benefit from insurance.
	Percentage of female-headed households participating in the scheme	Ditto
<b>National</b>	Declining poverty headcount	Catastrophic and repeated shocks are one of the main causes for chronic poverty. By reducing the impact of shocks on household assets, insurance could reduce the number of households falling below the poverty line and increase the number of households rising above it.
	Percentage of poor households with insurance coverage	Self-explanatory
	Percentage of poor households in high disaster risk areas covered by insurance	While all rural households may be exposed to adverse impacts of climate change and extreme weather events, the poorest households are likely to have greater exposure as many of them resort to living in hazard prone areas, e.g. on river banks, on the unprotected side of flood protection works, and on low-lying river islands.

Source: Author

## 6.6 Conclusions and Way Forward

Millions of poor farming households are frequently exposed to covariate and/or idiosyncratic shocks that make it difficult for them to move out of poverty. There are high expectations that agricultural insurance, as part of comprehensive risk management strategies, can assist these households. In some contexts, NGO-MFIs and other developmental NGOs with a strong presence in rural communities that are willing to experiment with product design and delivery may be the most effective conduits for insurance to poor farming households. To take on this role, they will first need to invest in generating local data and building information systems and the technical capacity of staff to handle insurance. They will also need to experiment with the losses covered, payout arrangements and triggers, packaging of insurance with other

products, as well as with delivery models. And they will need access to reinsurance and a supportive regulatory framework.

If NGOs are to take on a larger role in the delivery of insurance to poor farmers, systematic monitoring and evaluation of their insurance schemes from poverty alleviation, disaster risk reduction and climate change adaptation perspectives will be needed to enhance the effectiveness of these schemes. With this in mind, this chapter proposed a tentative list of indicators that could be built upon for comprehensive assessment of the effectiveness of insurance delivery to poor farming households.

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