

INSURANCE-RELATED OPTIONS FOR ADAPTATION TO CLIMATE CHANGE

Executive summary

The Munich Climate Insurance Initiative (MCII)

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Introduction

Record changes in atmospheric extremes and record losses from weather-related disasters in 2003, 2004 and 2005 have brought attention to climate change and its possible role in increasing the frequency and intensity of extreme weather events. Communities at risk, governments, international organizations, industry, and NGOs worldwide are seeking solutions for preventing and adapting to the rapidly multiplying impacts of climate change and weather-related disasters. As one possible solution, financial management of natural disasters is receiving attention on the agendas of international financial organizations. Article 4.8 of the United Nations Framework Convention on Climate Change (UNFCCC) and the supporting Article 3.14 of the Kyoto Protocol call upon developed countries to consider actions, including insurance, to meet the specific needs and concerns of developing countries in adapting to climate change. To date, there is little understanding of or agreement within the climate change community on the role that insurance-related mechanisms can play in assisting developing countries adapt to climate change.

The *Munich Climate Insurance Initiative (MCII)* was formed in 2005 by NGOs insurers and reinsurers, climate-change experts and policy researchers to provide a forum for examining insurance-related options that assist with adaptation to the risks posed by climate change. The full MCII report on *Insurance Related Options for Adaptation to Climate Change* will be posted on the following websites after COP 11: www.slf.ch/drf and www.iiasa.ac.at/Research/RMS. This summary outlines concrete options for climate negotiators to support insurance mechanisms for climate-related disasters in disaster-prone developing countries. It discusses the scientific and economic rationale of a climate “insurance” system, options for such schemes, funding opportunities, associated benefits and the role of the private sector. Special attention is given to India as a case study. We conclude, with specific recommendations, that negotiators at COP 11 should consider the many concrete options now available for supporting insurance-related mechanisms to meet the needs and concerns of developing countries in adapting to climate change.

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Background: disasters and climate change

Climate disasters include such events as heat waves, droughts, bush fires, tropical and extra tropical cyclones, tornadoes, hailstorms, floods and storm surges. The losses from natural disasters are increasing, a trend that is attributed mainly to the increasing concentration of people and economic values in urban areas and the migration of populations and industries into areas, such as coastal regions, that are particularly exposed to natural hazards. Considering weather-related disasters, a large proportion of the increase in economic losses from 1980 to 2004 has occurred in high-income countries that have experienced large increases in capital (lower middle-income countries have also experienced some increase). Still, the lower-income countries continue to bear the largest economic burden of disasters as measured in terms of GDP.

Evidence is mounting that climate change is already influencing the frequency and intensity of weather-related hazards. According to the World Meteorological Organisation (WMO), the last four years (2001 to 2004) were among the five warmest recorded worldwide since 1861, and 2005 is set to join them. The year 2005 set records for hurricanes in the North Atlantic: since records have been kept (1850) there have not been so many named tropical storms developing so early in the season (7 by the end of July), and the total number of 26 easily outstripped the old record of 21. Hurricane Wilma achieved the lowest recorded central pressure, and Hurricane Katrina was the most expensive ever. A MIT study by K. Emanuel (2005) shows that, since the 1970s, major tropical storms both in the Atlantic and the Pacific region have increased in duration and intensity by about 50 percent. Emanuel projects that this global warming-induced trend will continue in the future. A study by Barnett et al (2005) showed that temperatures in areas important for hurricane propagation have risen by 0.5°C due to global warming. British scientists estimate that it is very likely that human influence has already at least doubled the risk of a heat wave exceeding the threshold magnitude of the 2003 European heat wave (Stott et al., 2004).

Already today, increasing losses from natural disasters make it more and more difficult for disaster-prone nations, particularly small developing countries, to finance economic recovery. For example, losses during the 2004 hurricane season measured as a share of GDP amounted to 183 and 212 percent of GNP in the Cayman Islands and Granada, respectively. Due to limited tax bases, high indebtedness and low uptake of insurance, many highly exposed developing countries cannot, alone, fully recover from slow- and sudden-onset disasters. Given the costs of insurance instruments, it is not surprising that their uptake in developing countries of Africa, Asia and Latin America is far less than in North America, Europe, Japan and Australia.

Highly exposed developing countries rely extensively on external concessional borrowings from international development banks (such as World Bank, IDB and the IMF) and international donor aid to deal with the devastating consequences of natural disasters. A concern to donors and multi-lateral financial institutions, among others, is the increasing share of aid spent on emergency relief and reconstruction, which crowds out spending for social, health and infrastructure investments. The World Bank estimates that it has provided grants and loans for disaster relief and recovery of more than US\$ 38 billion to developing countries over the last two decades (Gurenko, 2004; Gilbert and Kreimer, 1999), and the Asian Development Bank also reports large loans for this purpose (Arriens and Benson, 1999). This means that disasters will continue to profoundly impact the lives, health, and property of millions of people, and will be acutely felt among the world's poorest people. To date, these vulnerable groups have also had the least access to affordable insurance.

The case of India

India is considered to be the second most disaster-prone country in the world. With a large and growing population, densely populated and low-lying coastline and an economy that is closely tied to its natural resource base, India is highly vulnerable to climate change. Disaster insurance cover, however, is low compared to international standards and plays only a complementary role. Disaster risk management, including financing relief and reconstruction, is primarily the responsibility of governments, which provide ex post assistance, or communities through informal risk sharing. Frequently governments and communities do not have sufficient resources, and households lacking insurance typically turn to moneylenders, selling assets, reducing inputs in farming, or diversifying their activities. Another strategy is to send family members to work elsewhere and remit payments. However, such traditional risk management strategies, while reducing vulnerability in the short term, can increase vulnerability over the longer term by promoting sub-optimal asset allocation. For instance, small farmers may opt for multiple cropping to reduce income variability rather than planting the most profitable crops. Traditional risk sharing strategies also break down in case of disasters affecting an entire community or area (Hess et al, 2002, Lilleor et al, 2005).

Low insurance penetration in India can be traced to a number of demand- and supply-side factors. On the demand side, the foremost difficulty is the unaffordability of insurance for low-income high-risk regions. Other hurdles include public myopia and low awareness among the public about insurance and risk management. The experience of major insurance companies shows that following a major catastrophe there is a rush for insurance cover, particularly for life and assets. But this interest is short lived, and in a majority of cases these policies are not renewed. Finally, large sections of the Indian economy operate outside the formal economy – not just small businesses, but also housing. On the supply side, easy access to insurance products is still an issue. The problem of scaling up small-scale schemes to encompass large rural areas is the biggest hurdle in enhancing overall penetration rates. The poor in many rural areas have higher disaster risk exposure and also suffer more vis-à-vis their urban counterparts (World Bank, 2003). More specifically, their vulnerability to climate- change risks is increased on two counts: their inability and/or unwillingness to involve in high-risk activities (for instance growing cash crops) that promise higher returns, and their inability to reside in disaster safe locations.

The entry of the private sector has metamorphosed insurance in India by greatly improving penetration levels. Companies have innovated with their product offerings and marketing strategies. For example, index-based weather risk micro-insurance programs have been pioneered in India as an alternative to traditional crop insurance. These instruments are linked to the underlying weather risk defined as an index (based on historical data, e.g. for rainfall, temperature, snow, etc) rather than the extent of loss (e.g. crop yield loss). It is estimated that currently about 150,000 farmers have purchased such cover in India. More capital will also encourage a greater involvement of global partners, and thereby, enhance product innovation, service quality and technology standards.

Climate insurance schemes for developing countries

Most relief and reconstruction is financed on an ad hoc basis after disasters occur (for example, local, national and international relief). Because of shortages and uncertainties of such "*ex post*" financing, there is growing interest in "*ex ante*" financial mechanisms where the funding is arranged in advance. These include insurance, derivatives and catastrophe bonds, which spread risk geographically, and savings, reserve funds or contingent credit arrangements, which spread risk over time. We refer to these instruments as *insurance-related*. Each has its strengths and weaknesses; what is appropriate to one situation may not work in another, but these instruments provide a broad portfolio of options.

Within the context of the UNFCCC, a number of proposals for insurance-related actions have been put forward. Three are discussed below. These schemes can be assessed by three criteria: (1) *fairness* (is the scheme considered legitimate and fair by both the contributors and the recipients?), (2) *efficiency* (does the scheme provide calculable (secure) financial protection and incentives for disaster prevention at the lowest possible cost, including the cost of market price distortions?), and (3) *practicality* (is it possible to implement the scheme given the institutional and financial setting?).

Global indemnification schemes: the AOSIS and Germanwatch proposals

The idea of an “insurance-related” scheme to help countries adapt to climate change was first introduced by the Alliance of Small Island States (AOSIS) in 1991. The AOSIS proposal sought to establish a fund with mandatory contributions from industrialized countries to indemnify small-island and low-lying developing nations for losses resulting from sea level rise. Although the AOSIS proposal was not strictly an insurance scheme, it motivated formulation of Article 4.8 of the Convention and a number of ensuing proposals for “insurance-related” schemes. Whereas the AOSIS insurance proposal addressed the slow onset of sea-level rise, subsequent proposals have turned to sudden-onset weather events and suggest tying assistance to loss reduction measures undertaken in potentially affected countries.

The Germanwatch proposal for an “insurance-related mechanism” (IRM) (Germanwatch, 2005) builds strongly on AOSIS ideas, but proposes cover for sudden-onset risks, including floods, droughts and windstorms, for public infrastructure. Like the AOSIS proposal, the fund would be capitalized through payments from developed countries. To be eligible for post-disaster indemnity, LDC governments would be required to take specified measures for preventing disaster losses. These “in-kind premiums” would be determined by assessing the country’s risk profile, and claims on the fund would be determined by an index or actual losses. The insurance would be limited to low-probability, high-consequence events. In a second tier, governments could optionally purchase commercial insurance for lower-impact, higher frequency weather events.

These proposals for global insurance systems rank high on many elements of fairness and efficiency. The Germanwatch proposal satisfies the UNFCCC’s stated criterion of “common but differentiated responsibilities” by targeting governments in need and only “kicking in” when losses exceed what the government can, itself, finance. Moreover, moral hazard is reduced through incentives and direct requirements for risk reduction. There are, however, problems with implementing the schemes. In both the AOSIS and Germanwatch proposals, payouts depend on a loss threshold, which means losses must be measured. This will involve high transaction costs, especially in the less developed countries, where there are no local insurance companies with the expertise to assess claims and help manage risks. In the case of the Germanwatch proposal, a problem arises in determining what kinds of mitigation measures will serve as the entry fee into the scheme.

Both proposals raise an important issue concerning the geographical scope of an insurance pool. It should be kept in mind that the number of participants in a global pool could be prohibitively large, even if the pool only covers public infrastructure risks. Perhaps more importantly, it is necessary to build confidence on the part of stakeholders at the local or national levels by working closely together in the initial phases. This does not mean that local or national pools cannot be combined into regional and global structures, but the risks must first be consistently dealt with within the contributory "domains."

The IIASA proposal

Researchers at the International Institute for Applied Systems Analysis (IIASA) have proposed a two-tiered climate change insurance-related mechanism that could meet the intent of Article 4.8. (Linnerooth-Bayer, et al. (2003) and Linnerooth-Bayer and Mechler (2004, 2005). The first tier is a global relief fund to cover losses that are either uninsurable or for which cover is unaffordable in poor countries. This tier would be covered by contributions from developed countries, much like that envisaged by AOSIS and Germanwatch, except the fund would be entirely discretionary. Based on the post-disaster needs of developing countries, it would provide discretionary assistance for relief and reconstruction; however, eligibility for post-disaster assistance could be tied to prescribed, stakeholder-led processes for credible efforts at reducing and managing disaster risks.

The second tier provides support for insurance initiatives taken by developing countries or regions, themselves. Precedents already exist for donor-supported insurance mechanisms. The World Food Program, for example, is planning to support weather derivatives in Ethiopia (provided by private insurers) to help farmers hedge against drought risks, and the World Bank provides low-interest capital backup to the (public-private) Turkish Catastrophe Insurance Pool (TCIP) to make it affordable to property owners. Such initiatives can be on a local level (e.g. Ethiopian weather derivatives), national level (the TCIP) and regional level (e.g., a regional pool has been proposed for the Caribbean states). Moreover, the pools could be combined through reinsurance or financial derivatives to diversify and spread risks globally. The second tier of the IIASA proposal takes the form of a global insurance facility, which would support these kinds of initiatives by providing capital backups in the form of reinsurance, by subsidizing premiums or by providing technical assistance.

The insurance pools could cover only climate-related risks or, alternatively, all hazards. The latter would provide more diversification and thus lower requirements for capital backup. However, the private sector is more reluctant to insure geo-hazards because of added difficulties in risk assessment. Finally, it is of utmost importance that the programs embed incentives for participants to reduce their risks.

In combination, the two tiers of the IIASA scheme promote many criteria of fairness, efficiency and practicality. The first tier might be considered fair insofar as it assigns financial responsibility for a portion of developing country disaster losses to the developed world. The second tier can potentially promote efficient insurance systems (although any form of subsidies distorts market prices). Finally, the recent initiatives and experience with donor-supported insurance systems demonstrate that the scheme is practical in terms of its implementation.

Previous consideration by UNFCCC

Under the Subsidiary Body for Scientific and Technological Advice of the UNFCCC (SBSTA), a workshop was held in June 2003 to consider the possibilities that insurance might offer for implementing Article 4.8. A key consensus among the expert attendees was that it is not possible to distinguish climate variability from climate change, and that therefore any insurance-related scheme would need to recognize this fact. Insurers noted that the risk/reward balance for catastrophe business in less developed countries was unattractive to them. Finally, it was agreed that insurance is just part of the solution to climate risk, and that it depends critically on risk assessment and risk reduction. Much “capacity-building” would be necessary in LDC’s before implementation could be attempted.

How would an insurance scheme be funded and what are the benefits?

Insurance-related mechanisms in developed countries are financed mainly through policy holder premiums. In some insurance systems policy holders pay risk-based premiums, but many include government subsidies or cross-subsidies within the system, such as the National Flood Insurance Program in the United States or the French all-hazards system that is backed by the public sector. Most policy holders face deductible structures that, in theory, should encourage them to reduce risks for the insured assets. In practice, this link is weak due to the high costs associated with monitoring risk reduction efforts. Often there is moral hazard, which is the relaxation of risk reduction efforts after purchasing financial protection.

The benefits of creating a fund to support insurance strategies in developing countries are numerous. By subsidizing or providing capital backup for risk transfer programs, developing country governments will rely less on debt financing and international donations, and assured funds for repairing critical infrastructure will attract foreign investment. Donor support will also provide poor households, businesspersons and farmers with access to affordable means to spread risks spatially and temporally, which will secure their livelihoods and improve their creditworthiness. Finally, and most importantly, by making this assistance contingent on requirements or incentives for prevention and appropriate adaptation measures, pre-disaster assistance can ultimately reduce the human and economic toll disasters take on the poor.

There are also considerable advantages to the UNFCCC Parties and other institutions in financing developing country insurance schemes. Foremost for UNFCCC Parties, a step towards meeting developing country needs for adapting to a changed climate would create a constructive atmosphere for post-2012 negotiations. Such a fund would also contribute to the agenda of disaster assistance organizations. By sharing responsibility with individuals and the state, donors would leverage their limited budgets and substitute a calculable annual commitment to a financial risk transfer system for the unpredictable granting of post-disaster aid. For international financial institutions, support to pre-disaster insurance programs would lessen their risk of recipient countries diverting their loans to disaster relief.

The Marrakesh Accords to the UNFCCC established three funds at its Seventh Conference of the Parties (COP-7) in 2001: a Least Developed Country (LDC) fund and a Special Climate Change (SCC) fund were established under the Convention [2] and an Adaptation fund under the Convention's Kyoto Protocol. Most relevant to this discussion is the Special Climate Change Fund, which will support a number of activities, including capacity building for preventive measures, planning, preparedness and management of disasters relating to climate change. The fund is financed by revenues from the Clean Development Protocol, but, to date, has very limited capacity. Even if its capacity should increase, the fund's mandate is constrained - only capacity building for disaster risk management lies within its power. Clearly, if Article 4.8 is to be implemented along the lines suggested in this report, it will require changing the mandate of the SCC fund, or creating a new fund.

In either case, sufficient capital for supporting insurance schemes in developing countries may require sources beyond revenues currently generated or projected from the Clean Development Mechanism. Parties should consider three possibilities for meeting additional funding requirements: One would be that UNFCCC could decide on an adaptation fee for all flexible mechanisms. A second option is that Annex I countries could generate capital, for example, by taking a percentage of income from national emissions trading schemes, setting a climate fee on aviation or a general fee on green-house gas emissions. Finally, a fund for implementing Article 4.8 could be leveraged by combining with other donor organizations and international financial institutions. For example, the World Bank is creating a Global Index Insurance Fund (GIIF), which will combine private and donor capital

to support index based insurance schemes (like weather derivatives) in developing countries. The climate change community could join other donors (e.g., the European Union is contributing to the GIIF) in supporting this fund.

The role of the insurance and reinsurance sector

The key actors on climate-related insurance in the private sector are insurers and reinsurers, however there are many others too, providing a wide range of essential functions: brokers, risk modellers, loss adjustors, customer associations, banks, and more recently, investors. For the private sector, a very important consideration is that local, national and regional levels are not bypassed in favour of a global pool. The number of participants in a global pool could be rather large, but more importantly, it is necessary to build confidence on the local levels in the concepts by stakeholders working closely together in the initial phases of setting up schemes. Even a supra-national pool must respect the underlying principles of insurance, which means that risks must be consistently estimated and dealt with within the national or regional markets.

Irrespective of whether support goes to regional, global, climate-only or all-hazard insurance systems, the private market can play an important role. Private insurers are already active in providing insurance for index-based schemes in India, Ethiopia and Malawi. However, commercial insurers are reluctant to provide cover for floods, windstorm and other potentially high consequence climate events, especially if it involves risks with little historical data. The main problem is that the necessary premiums for high-risk cover are not affordable to low-income governments or citizens. Public-private partnerships, or donor support, could potentially make the market more attractive to private insurers.

When considering whether a climate facility should support all-hazard or climate-only schemes, there are some important differences from the view of the private sector. Since geo-hazards, like earthquakes and volcanoes, are often less well known and less frequent than climatic events, private insurers consider that risk assessments are in the category of pure research, and should be carried out by the public sector. Given the relative lack of warning of non-climatic events, again the private sector role in providing cover in this area is reduced. The critical feature is that design standards must be adequate and enforced, and underwriters must be able to measure and reflect this in their terms. Finally, the private sector is wary of accepting risk due to the greatly increased, but more uncertain, exposure- to loss.

Importantly, there are many essential non-risk-bearing functions that can be provided effectively by the private sector. These include technical support for risk assessment, risk management, product design, distribution, marketing, loss handling and administration. A fruitful approach to explore is public-private partnership, where the public sector sets a rigorous framework to control and reduce the physical risks, and also provide cover for high levels of risk or sectors with high administration costs, while the private sector provides services and cover for lower levels of risk and sectors that are easily accessible.

Recommendations

1. Organizations and other stakeholders in climate change, disaster management, and development should take a serious interest in the potential of insurance and insurance-related mechanisms to spread and reduce the losses from events related to climate change and climate variability.
2. Based on the needs of communities at risk, a wide coalition of interested bodies should advance the climate insurance agenda more aggressively. The evolving interest and actions in the area of climate insurance should be closely related to activities in the disaster mitigation field.
3. In particular, the UNFCCC process, including the subsidiary bodies on science and technology and implementation, should extend its consideration of insurance-related mechanisms. Consideration of the scientific and technical aspects of climate insurance should be a central theme in the new 5-year program of work on adaptation (PWA) now being designed in the SBSTA.
4. A rigorous technical, financial and policy assessment should be made of the need for and the low availability of private or publicly-funded insurance in the climate risk area; the reasons for this, and the possible response options.
5. Existing climate and disaster insurance initiatives should be carefully assessed and lessons drawn concerning their potential for replication or further expansion. It should be assessed how these mechanisms can be made complementary to traditional solidarity based coping strategies instead of risking to undermine them.
6. A possible approach that should be explored and developed is the utilization of pilot projects. Existing pilot projects could be built upon and more could be developed to learn by experience. Recent pilot projects providing indexed weather derivatives in India and other countries could serve as examples.
7. The potential role of climate-related insurance should be a factor to be considered in the negotiations concerning the post-2012 regime under the Kyoto Protocol.
8. Recent concrete proposals, for example, on the part of GermanWatch and IIASA, could serve as a basis for discussions and formulations of a negotiated agreement in the context of Article 4.8, which calls for the consideration of insurance to help developing countries adapt to climate change. These proposals call for a facility to support insurance-related actions, and these actions can now be grounded in recent experience of donor-supported insurance systems that are affordable to low-income, high-risk regions.
9. The most effective way forward is a public-private partnership, where insurance-related systems are coupled with explicit measures to prevent disasters. The private sector can play a vital role in climate insurance systems for developing countries
10. The Munich Climate Insurance Initiative should be (is?) prepared to cooperate in realizing these recommendations by lending its support and technical expertise, where possible, to the various studies and consultations that are needed to develop alternative mechanisms for public-private partnerships in the newly developing field of climate-related insurance.

This summary is based on selected material from the MCII report *Insurance-related Options for Adaptation to Climate Change*, which after COP 11 can be found on www.slf.ch/drf and www.iiasa.ac.at/Research/RMS. The report is a compendium of the following papers:

1. Scientific and economic rationales for innovative climate insurance solutions

Peter Höppe and Eugene Gurenko (Munich Re/World Bank)

2. The Indian insurance industry and climate change: exposure, corporate responsibility, and strategies ahead

Ritu Kumar (The Energy and Resources Institute (TERI))

3. Insurance- related mechanisms for assisting developing countries adapt to Climate Change

Joanne Linnerooth-Bayer and Reinhard Mechler (International Institute for Applied Systems Analysis (IIASA))

4. Financing, contributions and benefits associated with insurance-related mechanisms

Christoph Bals, Sonja Butzengeiger, Koko Warner (Germanwatch/Institut für Schnee- und Lawinenforschung (SLF))

5. The Role of the Private Market

Andrew Dlugolecki and Erik Hoekstra (Tyndall Centre/Munich Re)

6. Conclusions

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