

Insurance for assisting adaptation to climate change in developing countries: a proposed strategy

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Abstract

This paper suggests a two-tiered climate insurance strategy that would support developing country adaptation to the risks of climate variability and meet the intent of Article 4.8 of the United Nations Framework Convention on Climate Change (UNFCCC). The core of this strategy is the establishment of a climate insurance programme specialized in supporting developing country insurance-related initiatives for sudden- and slow-onset weather-related disasters. This programme could take many institutional forms, including an independent facility, a facility in partnership with other institutions of the donor community, or as part of a multi-purpose disaster management facility operated outside of the climate regime. Its main purpose would be to enable the establishment of public-private safety nets for climate-related shocks by assisting the development of (sometimes novel) insurance-related instruments that are affordable to the poor and coupled with actions and incentives for pro-active preventive measures. A second tier could provide disaster relief contingent on countries making credible efforts to manage their risks. Since it would be based on precedents of donor-supported insurance systems in developing countries, a main advantage of this proposed climate insurance strategy is its demonstrated feasibility. Other advantages include its potential for linking with related donor initiatives, providing incentives for loss reduction and targeting the most vulnerable. Many details and issues are left unresolved, and it is hoped that this suggested strategy will facilitate needed discussion on practical options for supporting adaptation to climate change in developing countries.

Keywords: Climate change; Insurance; Disasters; Article 4.8; Adaptation; Vulnerability; Developing countries

1. Introduction

Adaptation to climate change, including support for insurance instruments, has emerged on the climate agenda alongside the reduction of atmospheric greenhouse gas concentrations as an essential part of the response to climate change risks. It is generally accepted that industrialized countries bear a certain responsibility for adaptation to climate change in developing countries, and should bear part of the costs. Although a diversity of mechanisms, approaches and rules for funding adaptation in developing countries has been adopted by implementing agencies and

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governments in the context of the United Nations Framework Convention on Climate Change (UNFCCC), adaptation is generally considered to be an underdeveloped part of the climate regime. Early efforts to address adaptation under the UNFCCC have focused on capacity building and information exchange with respect to vulnerability to climate change and possible adaptation strategies. There is an increasing appreciation that minimizing vulnerability to the economic and physical impacts of climate-related extreme weather events, including floods, droughts, typhoons and other weather hazards, can cost-effectively contribute to reduced vulnerability. Moreover, many in the climate community are advocating that climate risk reduction be mainstreamed into the development process to simultaneously contribute to eradicating poverty, furthering development, and achieving the Millennium Development Goals. Efforts have aimed at funding strictly climate-change-related activities, but there are increasing calls that adaptation should be driven by vulnerability and poverty, and that it should be mainstreamed into the development process (Kantha et al., 2006).

The reduction of the escalating losses from floods, droughts, typhoons and other climate-related disasters is viewed as essential to eradicating poverty and achieving the Millennium Development Goals (Arnold and Kreimer, 2004). In the past quarter-century, over 95% of disaster deaths occurred in developing countries, and direct economic losses (averaging US\$54 billion per annum) as a share of national income were more than double in low-income than in high-income countries (Arnold and Kreimer, 2004). Although the increase in disaster losses today is largely driven by socio-economic factors, there is mounting evidence of a significant climate-change signal in disaster events, for example, increasing extreme precipitation at mid- and high latitudes (Schönwiese et al., 2003), extreme floods and droughts in temperate and tropical Asia, severe dry events in the Sahel and southern Africa (IPCC, 2001), and increases in tropical cyclone activity in the Atlantic and the Pacific region (Emanuel, 2005). Scientists, however, cannot accurately assess the contribution of climate change to current risks. Nevertheless, many in the climate community are calling for a 'no-regrets' adaptation strategy that integrates adaptation to climate change with adaptation to 'normal' climate variability. Improving the capacity of communities, governments or regions to deal with climate variability will be likely to improve their resilience to deal with future climatic changes. This means that increasing attention must be paid to disaster risk management.

An important cornerstone for risk management, and a possible no-regrets adaptation strategy, is insurance and alternative risk-transfer instruments that provide disaster safety nets for the most vulnerable (Linnerooth-Bayer et al., 2005). Without donor support, however, insurance is hardly affordable in highly exposed developing countries, which helps to explain why only 1% of households and businesses in low-income countries, and only 3% in middle-income countries, have catastrophe coverage, compared with 30% in high-income countries (Munich Re, 2005). Instead of insurance, they rely on support from family and governments, which is not always forthcoming for catastrophes that affect whole regions or countries. Disasters exacerbate poverty as victims take out high-interest loans, sell assets and livestock, or engage in low-risk, low-yield farming to lessen their exposure to extreme events. Moreover, without a post-disaster infusion of capital for reconstruction, disasters can have long-term adverse effects on economic development. As a case in point, 4 years after the devastation of Hurricane Mitch in 1998, the GDP of Honduras was 6% below pre-disaster projections (Mechler, 2004), and the disaster increased the number of the poor by 165,000 people (Government of Honduras, 2001).

Climate risk management, including proactive support for insurance instruments, is emerging on the climate change adaptation agenda. Article 4.8 of the UNFCCC calls upon Convention Parties to consider actions, *including insurance*, to meet the specific needs and concerns of

developing countries arising from the adverse impacts of climate change (United Nations, 1992), and Article 3.14 of the Kyoto Protocol explicitly calls for consideration of the establishment of insurance (United Nations, 1997). In an early proposal for an ‘international insurance pool’ within the UNFCCC context, the Alliance of Small Island States (AOSIS) put forth the idea of a global compensation fund fully financed by industrialized countries for the purpose of compensating low-lying states for sea-level rise damages. The AOSIS proposal addressed what is arguably an uninsurable risk (since sea-level rise is gradual and its occurrence predictable) for which the victims have little responsibility.

This article addresses a different risk context, that of stochastic sudden- and slow-onset weather-related disasters, and suggests a two-tiered climate insurance strategy. The first tier, and the core of this strategy, is the establishment of a climate insurance programme that would offer capacity building and financial support to nascent (weather) disaster insurance systems in highly exposed developing countries. This support could be offered independently or in partnership with other donor organizations by creating a climate insurance facility or other mechanism. Alternatively, it could be ‘mainstreamed’ into the operations of a multi-purpose disaster risk management facility. A main purpose of the climate insurance programme is to enable the establishment of public/private safety nets for stochastic climate-related shocks by assisting the development of insurance-related instruments that are affordable to the poor, coupled with actions and incentives for proactive preventive (adaptation) measures. As a second tier of support, adaptation funding could be apportioned to post-event relief for weather-related disaster risks that are otherwise uninsured because of data or institutional limitations.

The intent of this discussion is *not* to provide a concrete proposal for negotiation, but rather to suggest a broadly conceived climate insurance strategy as a basis for further discussion and deliberation. We begin in the next section by briefly reviewing the AOSIS and other recent climate insurance proposals that provide the background for our suggested strategy. We continue in Section 3 by outlining the workings of the first-tier climate insurance programme, which builds on developing country initiatives and thus avoids the expense and obstacles of operating an independent system. Based on experience in India, Malawi, Turkey and Mexico, we give concrete examples of the types of insurance initiatives that the programme might support. In Section 4, we offer preliminary thoughts on a possible second tier, which would provide disaster relief contingent on credible risk management policies or actions. Section 5 discusses challenges and opportunities for financing and implementing this two-tiered strategy. Section 6 concludes by briefly reviewing the advantages of this proposal, including its feasibility and potential for linking with other donor initiatives, providing incentives for loss reduction (adaptation) and targeting the most vulnerable. The unresolved issues are discussed, including the necessary institutional design, possible limits on support (for instance that funds be commensurate with the incremental risk of climate change), and sources for the requisite resources.

2. Climate insurance proposals

2.1. AOSIS proposal

Introducing the term ‘insurance’ for the first time, the Alliance of Small Island States (AOSIS) suggested in 1991 that an ‘international insurance pool’ funded by industrialized (Annex II) countries be established under the control of the Conference of the Parties (COP) to compensate small-island and low-lying developing nations for the uninsured loss and damage from slow-onset

sea-level rise. The pool would

compensate developing countries (i) in situations where selecting the least climate sensitive development option involves incurring additional expense and (ii) where insurance is not available for damage resulting from climate change (Intergovernmental Negotiating Committee, 1991).

Mandatory contributions to the fund would be made to an administrating authority, which would also be responsible for handling claims made against the resources of the fund. As a basis for settling claims, the proposal contemplated that assets in developing countries potentially affected by sea-level rise would be valued and registered with the authority. Trigger levels (levels of sea-level rise that would legally require the payment of claims) would be subject to negotiation between individual countries and the authority. Importantly, in assessing claims, the authority was to determine whether and to what extent the loss or damage could have been avoided by measures which might reasonably have been taken at an earlier stage, thus avoiding the moral hazard of not taking appropriate preventive measures. Assets covered by commercial insurance would not be compensated by the scheme.

There are difficult challenges in implementing the AOSIS proposal. Valuing all properties and verifying loss claims in countries with no indigenous insurance structures would impose large transaction costs on the system. Determining 'reasonable' loss-reduction measures is also problematic. Nonetheless, the proposal was, and remains, a valuable first step in presenting concrete ideas on how developed countries could take financial responsibility for climate-change impacts accruing to vulnerable developing countries.

2.2. Müller proposal

Whereas the AOSIS insurance proposal addressed the gradual onset of sea-level rise, subsequent proposals have turned to sudden-onset weather events such as floods, tropical cyclones and sea surges (worsened by sea-level rise). Müller (2002) advocated a switch from the current international disaster relief system characterized by voluntary, media-driven and uncoordinated donations to a Climate Impact Relief Fund (CIRF), which is regularly funded up-front and centrally administered by the UNFCCC in order to increase efficiency and fairness. No 'new money' would be needed, since OECD or Annex II countries would donate to the fund proportionally to their current average post-disaster assistance spending. According to Müller, further options for such a fund could be to provide disaster preparedness support and adopt burden-sharing criteria, such as based on financial ability or a CO₂-emission-based system.

2.3. Germanwatch proposal

The Germanwatch proposal for a Climate Change Funding Mechanism (Bals et al., 2006) builds strongly on the AOSIS and Müller proposals. The authors propose a global catastrophe insurance programme funded by developed countries and administered by a public/private entity. The scheme would be limited in scope by indemnifying only public infrastructure damage in least-developed countries (LDCs) and offering cover only for rare, high-consequence, climate-related risks. As an interesting innovation, there would be in-kind premium payments in the form of implemented loss-reduction measures by public clients who voluntarily join the scheme: the CCFM would define

minimum risk reduction measures to be undertaken by the country where the annual cost to the country is commensurate with the level of imputed risk-based premium.

Defining risk-reduction measures by an outside authority (for example, requiring squatters to evacuate areas targeted for flood-control dams) may be problematic, especially if not subject to government and stakeholder involvement. Moreover, least-developed countries may find it difficult to finance mitigation measures that cover the imputed risk-based premium. For highly exposed LDCs, this premium can be quite substantial. For example, in the recently introduced drought insurance programme in Malawi, annual premiums amounted to 6–10% of the insured crop value (Opportunity International, 2005). Finally, the strategy can be inefficient if the required measures are not cost-effective or high priority in the country.

The Germanwatch strategy also faces problems in its practical implementation. Besides costly monitoring of adaptation measures, post-disaster losses must be assessed to determine the triggering threshold. This will involve high transaction costs, especially in the less-developed countries lacking insurance infrastructure and claims handling expertise. It will also encourage overestimation of loss figures, which will be difficult to verify. Assessing risks, setting in-kind premiums, monitoring adaptation measures and settling claims will require a large administrative apparatus. Finally, targeting governments for claims payments poses the same problem that donors confront with post-disaster aid – payments in the hands of corrupt officials may not reach their intended purpose. Despite the drawbacks, the Germanwatch proposal and its predecessors have strong merits. They target the most vulnerable and encourage proactive risk management measures in highly exposed countries.

3. Towards a complementary strategy for implementing Article 4.8

In a background paper prepared for a UNFCCC meeting on climate change and financial adaptation (Linnerooth-Bayer et al., 2003; see also Linnerooth-Bayer and Mechler, 2003) the authors suggest that implementation of Article 4.8 could be based on developed (Annex II) country support for developing country insurance initiatives. In this article, we elaborate on this earlier concept by proposing a two-tiered climate insurance strategy. As shown in Figure 1, the first tier would take the form of a climate insurance programme that provides support to nascent (climate-related) disaster insurance systems in highly exposed developing countries. The second tier would provide post-disaster relief to countries that demonstrate credible efforts in managing their risks. In this section we elaborate on the first tier of support.

Climate Insurance Strategy	
Tier 1: Climate Insurance Programme	Tier 2: Disaster Response Programme
Support for nascent disaster risk financing mechanisms for climate-related risks at the local and national levels	Relief for: <ul style="list-style-type: none"> • Climate-related disasters not (yet) financially protected • Uninsurable climate-related disasters

Figure 1. The two tiers of a climate insurance strategy.

In contrast to the Germanwatch proposal, which advocates the creation of a global insurance scheme with full responsibility on the relevant authority for underwriting risks and administering an insurance system, the first tier of this strategy would be based on shared responsibility at the local, national and global levels. The climate insurance programme could stand alone, for example, with the creation of an independent climate insurance facility, or it could operate in partnership with other organizations, including international financial institutions, bilateral donors, international organizations, non-governmental organizations and the insurance industry. Alternatively, the funds could be mainstreamed into a multi-purpose, multi-donor disaster risk management facility.

A main aim of this proposed climate insurance programme is to enable the establishment of public/private safety nets for stochastic weather-related shocks by making use of insurance instruments that are affordable to vulnerable and marginalized communities, coupled with actions and incentives for proactive preventive (adaptation) measures. As illustrated in Figure 2, this programme would provide assistance to a wide range of insurance-related initiatives, including schemes providing cover for (1) property, crops, life and health impacts, and (2) government liabilities for public infrastructure damages and relief spending. Assistance could take many forms, including technical support for feasibility studies and capacity building, and financial support in the form of reinsurance and subsidies. It could be extended to schemes at the local, national, regional and even global levels, complementing each other and leading to better global risk diversification and, as a consequence, reduced premiums.

Without this assistance, insurance programmes will not be viable in many highly exposed developing countries. Because of the high costs of insuring correlated or covariant disaster risks (which affect whole regions at the same time), individuals can pay substantially more than the

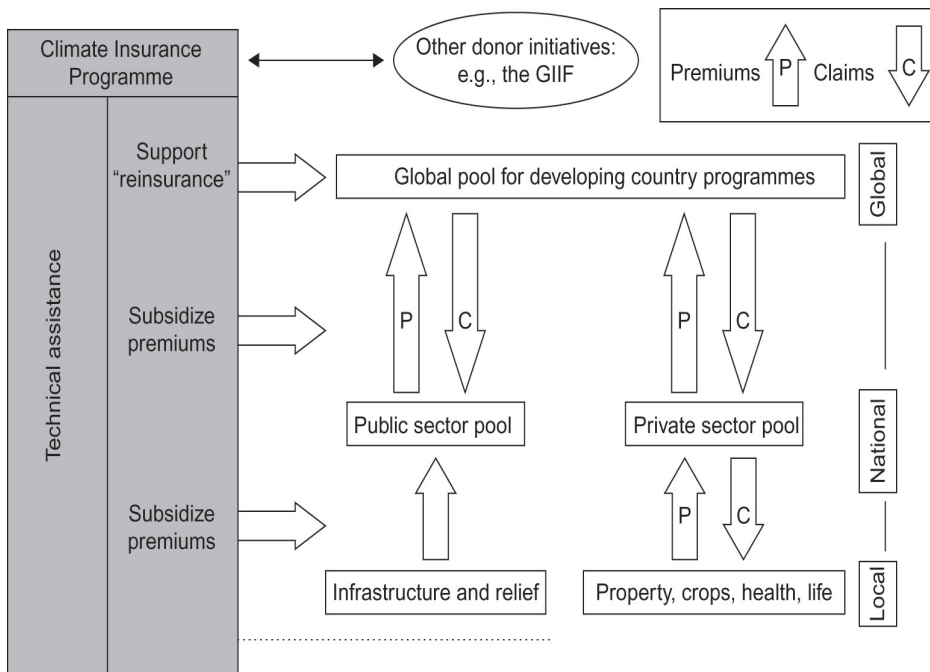


Figure 2. An illustration of the climate insurance programme.

expected losses they will experience over the long term, which may not be feasible or desirable without donor support. Donors can also ensure the proper design of insurance contracts to reward risk-reducing behaviour and thus avoid ‘moral hazard’, which means that individuals take fewer precautionary measures because they are insured (Brown and Churchill, 2000). Moreover, donors can promote the development of local catastrophe insurance markets by offering additional fairly priced reinsurance capacity. Such an approach will help reduce the risk of insurer insolvency and defaults on claims in the case of large or repeated catastrophes (Brown et al., 2000), and will contribute to making these systems accessible and affordable to the poor.

Four cases of recent donor-supported insurance initiatives, with illustrative examples, are described below and serve to illustrate the possibilities for a climate insurance programme.

3.1. *Assisting index-based insurance for crops and livelihoods*

More than 40% of farmers in developing countries face threats to their livelihoods from adverse weather (World Bank, 2005a). Weather risk destabilizes households and countries and creates food insecurity. In the Southern African Development Community (SADC), as a case in point, floods, cyclones and droughts have been a major cause of hunger affecting more than 30 million people since 2000. Governments and donors react to these shocks rather than proactively managing the risks. These emergency reactions have been criticized for being *ad hoc*, sometimes untimely, and destabilizing local food markets (Hess and Syroka, 2005).

Novel insurance instruments are emerging to address problems of food insecurity, even for high-frequency, slower onset disasters, such as droughts. Affordable insurance can provide low-income farm households with access to post-disaster liquidity, thus securing their livelihoods and avoiding famine. Moreover, insurance improves their credit worthiness and allows smallholder farmers to engage in higher-return crop practices. According to the World Food Programme (2005, p. 7):

Because of the extreme and covariant nature of the risks they face, and in the absence of risk-management instruments such as crop insurance, risk-averse smallholder farmers naturally seek to minimize their exposure ... by opting for lower-value (lower-risk) and therefore lower-return crops, using little or no fertilizer and over-diversifying their income sources. These risk-management choices also keep farmers from taking advantage of profitable opportunities; they are a fundamental cause of continued poverty.

3.1.1. *Example: Index-based insurance in Malawi*

In Malawi, where the economy and livelihoods are severely affected by rainfall risk, resulting in drought and food insecurity, groundnut farmers can now receive loans that are insured against default with an index-based weather derivative (Hess and Syroka, 2005). This is a contingent contract with a payoff determined by weather events, in this case a specified lack of precipitation recorded at a specified weather station. Farmers collect an insurance payment if the index reaches a certain measure or ‘trigger’, regardless of actual losses.

The Malawi pilot project offers a packaged loan and index-based microinsurance product to groups of groundnut farmers organized by the National Smallholder Farmers Association. Accordingly, the farmer enters into a loan agreement with a higher interest rate that includes the weather insurance premium, which the bank and rural finance institution pay to the insurer, the Insurance Association of Malawi. In the event of a severe drought (as measured by the rainfall index), the borrower pays only a fraction of the loan due, and the rest is paid by the insurer directly

to the bank. Without this insurance, banks rarely loan to high-risk, low-income farmers, which means they cannot obtain needed credit to invest in the seeds and other inputs necessary for higher-yield crops. Moreover, because of the physical trigger, there is no moral hazard; on the contrary, farmers will have an incentive to reduce potential losses, for example, by diversifying their crops. Nor is there a need for expensive individual claims-settling, and expedient payments will reduce the need for farmers to sell their assets and livestock to survive the aftermath of a disaster. One drawback of index insurance, however, is ‘basis risk’, which means that payouts may not be fully correlated with losses.

The World Bank has provided technical assistance and training in developing this weather insurance product (H. Ibarra, personal communication, 2005). By reducing loan repayments in the case of drought, the Malawi scheme only indirectly protects farmers from loss of livelihood and food insecurity. Still, it illustrates a large potential for donor-supported, index-based schemes that can, in contrast to the Malawi case, be designed to provide needed liquidity after major disasters. In India, for example, international technical assistance has been instrumental in the current success of index-based crop insurance programmes, which have increased penetration from 230 farmers to over 250,000 over a 3-year period, and similar schemes have been implemented or are under way in Mongolia, Ukraine, Peru, Thailand and Ethiopia (Mechler et al., 2006). Unless supported by technical assistance, national subsidies (cross-subsidies, as in India), or international donors, these schemes are out of reach for very low-income smallholder farmers. As illustrated in Figure 2, providing this support presents an opportunity for a climate insurance programme.

3.2. Assisting microinsurance schemes for property and life in low-income countries

Any discussion on how to support risk pooling and transfer in developing countries must take into account the capacity to engage in such efforts by the vulnerable and marginalized. The alternatives to insurance for many in the developing world include arrangements that involve reciprocal exchange, such as kinship ties and community self-help. Despite their limitations, Cohen and Sebstad (2003) claim that these risk-sharing arrangements work reasonably well for less severe and idiosyncratic shocks. However, they are inadequate and inappropriate for catastrophes that affect people throughout a region or country. Without reciprocal support or outside aid, disasters can lead to a ‘cycle of poverty’, as victims take out high-interest loans (or default on existing loans), sell assets and livestock, or engage in low-risk, low-yield farming to lessen their exposure to extreme events (Siegel, 2005).

3.2.1. Example: Microinsurance in India

The coastal Andhra Pradesh region of India is exposed to multiple and severe hazards, including floods, landslides, earthquakes and cyclones. Since 2004, microinsurance services have been provided in this region as part of the voluntary Disaster Preparedness Programme, which also offers capacity building of communities, government, civil society and media organizations. In partnership with the Oriental Insurance Company, this programme offers multiple-hazard insurance coverage for property and life risks to groups of women with a minimum size of 250 members. Coverage under this scheme is extended currently to more than 1,000 families.

Disaster insurance in Andhra Pradesh has been made affordable to low-income women with subsidies from two sources. Since 2000, the Indian regulatory authority has required insurers wishing to operate in India to service the low-income segment of society, and many insurers appear willing to incur a loss on their microinsurance business in order to access the broader

market. Insurers such as the Oriental Insurance Company thus offer affordable contracts to low-income communities made possible by cross-subsidies from their other lines of business and wealthier clients. As a second source of subsidy, the UK-based donor NGO Oxfam paid 50% of the premium in the first year. Furthermore, Oxfam actively convinced the private insurer to offer very low cost insurance by training disaster management volunteers, who assist in providing insurance services such as helping communities in the claims process. Indian regulation and the success of NGO–insurer partnerships have motivated private insurance companies in India to actively pursue business with the poor (Krishna, 2005).

The Oxfam project, along with many other such programmes arising throughout Asia, Africa and Latin America (see Mechler et al., 2006), provides a second illustration of the types of disaster insurance schemes that could be supported by a climate insurance facility. Because of the covariant risk (raising the premiums due to costly back-up capital), disaster microinsurance is hardly affordable to low-income households or businesses without the kind of support recently institutionalized by Indian regulation and provided by donor organizations. This provides another example of how a climate insurance programme could support insurance in developing countries.

3.3. Assisting insurance schemes for private property in middle-income developing countries

Even in middle-income developing countries, such as Turkey and Mexico, many high-risk households and businesses cannot easily afford commercial insurance. Catastrophe insurance premiums fluctuate widely and are often substantially higher than the pure risk premium mainly because the insurer's cost of back-up capital is included in the costs. For example, in the Caribbean region, insurance premiums were estimated to represent about 1.5% of GDP during the period 1970–1999, while average losses per annum (insured and uninsured) accounted for only about 0.5% of GDP (Auffret, 2003). A formidable challenge facing insurance mechanisms in highly exposed developing countries is thus rendering them affordable to low-income clients.

3.3.1. Example: The Turkish Catastrophe Insurance Pool

The Turkish Catastrophe Insurance Pool (TCIP) launched in 2000 is the first of its kind to tackle the problem of insurance affordability in a middle-income developing country (see Gurenko, 2004). Istanbul faces a high probability of a severe earthquake (Parsons, 2004). In response to this risk, earthquake insurance policies are now obligatory for all property owners in Istanbul and other high-risk urban centres. Property owners pay a premium based in part on their risk-reduction measures, such as retrofitting their apartment buildings, to a privately administered public fund. The system does not apply to most of Turkey's very poor households by exempting property owners in rural areas. To reduce premiums and thus make the system affordable to urban dwellers, the World Bank absorbs a pre-specified part of the risk by providing a contingent loan facility with highly favourable conditions and contingent on the occurrence of a major disaster. In other words, if the fund cannot meet claims after a major earthquake, or if the earthquake is particularly catastrophic, the World Bank provides low-cost capital to the pool.

The TCIP would not have been possible without recent advances in catastrophe modelling. In the absence of large sets of historical data, advanced risk modelling simulation techniques have increased the confidence insurers place in risk estimates and have greatly enhanced the insurability of catastrophic risks (Kozłowski and Mathewson, 1997; Bier et al., 1999; Boyle, 2002; Clark, 2002). Although risk assessments can be very resource-intensive, by drawing attention to risk and

prevention measures they can be useful beyond the pricing of insurance contracts. This is the case in Turkey, where local universities have worked together with government in assessing risks and drawing up a blueprint for prevention.

While the TCIP has received criticism about its imposition of mandatory policies, its somewhat weak link to risk reduction, and complications concerning illegal dwellings in Istanbul, this pioneering effort sets an important precedent as the first operational nation-wide disaster insurance system in a developing country. It has been made viable by an international financial institution providing technical support and absorbing a part of the risk. As such, the TCIP, like the micro-insurance schemes discussed above, provides another example of how a climate insurance facility can support developing-country insurance programmes. Although the TCIP addresses only earthquake risk, similar support could be extended to insurance systems that provide financial protection for floods, windstorms and other sudden-onset, climate-related disasters. This is the third example of how a climate insurance programme could be targeted to assist adaptation.

3.4. Assisting insurance mechanisms for public sector liabilities

Governments of highly exposed developing countries also need the assurance of sufficient funds to enable them to rebuild critical infrastructure and provide post-disaster relief. Without sufficient funds, the follow-on costs can be extensive. In the past, however, post-disaster sources of finance in developing countries have been woefully inadequate to assure timely relief and reconstruction. For example, 2 years after the 2001 earthquake in Gujarat, India, assistance from a government reserve fund and international sources had reached only 20% of original commitments (World Bank, 2003). International support for the India Ocean tsunami was exceptional, with estimates of about \$7,000 per affected victim, which can be compared, for example, with the devastating floods affecting Bangladesh in 1998, where support was estimated at about \$3 per affected victim (Tsunami Evaluation Coalition, 2006).

3.4.1. Example: Mexico's catastrophe bond

In Mexico, a taxpayer-supported national catastrophe fund (FONDEN) provides the government with needed funding for disaster relief. Since current and predicted reserves are considered insufficient for a major earthquake or other severe catastrophe, the Mexican authorities developed a mixed catastrophe bond and insurance risk-transfer strategy to protect FONDEN against catastrophic events, and in 2006 Mexico became the first sovereign country to issue a catastrophe bond (V. Cardenas, personal communication, 2006). A catastrophe bond is an instrument whereby the investor receives an above-market return when a specific catastrophe does not occur in a specified time (e.g. an earthquake of magnitude 7.5 or greater on the Richter scale in the vicinity of Mexico City over a 3-year period) but sacrifices interest or part of the principal following the event. The government's disaster risk is thus transferred to international financial markets that have many times the capacity of the reinsurance market. One major advantage of a catastrophe bond is that it is held by an independent authority and is not subject to credit risk. The payments go directly to the government, which in turn passes them on to FONDEN.

The development of Mexico's catastrophe bond was made feasible in the initial stages with technical assistance from the World Bank, but otherwise Mexico, as a middle-income developing country and member of the OECD, financed the bond out of its own means. This may not be possible for low-income countries, which presents another opportunity for assistance from a climate

insurance programme (see Figure 2). This support can also take advantage of other financial instruments. For example, the World Bank has recently agreed to support the Colombian government's risk management plan with a contingent credit arrangement (World Bank, 2005b).

3.5. Summary

These examples demonstrate four types (among many) of interventions and support that could be offered by a climate insurance programme, either alone or in partnership with other donor organizations. These interventions include the provision of technical assistance, financial subsidies and reinsurance. It is worth emphasizing that this support, if financed through adaptation funds, would be based on recent and innovative precedents – on the part of the World Bank, the World Food Programme, Oxfam, and other donor and financial organizations. There are many possibilities for apportioning support; for instance, developing country governments and private initiatives might submit applications that are assessed according to specified criteria, such as their fairness, efficiency (in terms of risk reduction measures), practicality and governance (in terms of democratic procedure and stakeholder involvement in their design).

Interventions in the form of a climate insurance programme can render disaster insurance affordable in developing countries, and can also be tied to preventing risks. Furthermore, this assistance could increase the geographic spread and diversification of the risks (as shown in Figure 1), which is essential for assuring the robustness of insurance systems in terms of their capacity to absorb large or multiple shocks. This is particularly important for covariant losses that impose a substantial risk of insolvency on small insurance pools.

4. Thoughts on a second tier of support

As described above, a climate insurance programme for stochastic sudden- and slow-onset weather disasters, either through a climate insurance facility or other institutional arrangement, would not cover uninsurable risks or communities without access to insurance. In theory, all risks that can be reliably estimated and for which there is uncertainty with regard to their timing and consequences are insurable (Kunreuther, 1998); yet, in practice, insurance will not be offered for many types of catastrophic risks for reasons of both demand and supply. Risk perception and the lack of an insurance culture are two reasons, among others, that limit demand for even affordable insurance. Ambiguity in the risks and their estimates and problems of adverse selection (those most at risk tend to join the pool) are among the reasons for limited supply. Finally, insurance systems cannot be designed and implemented given insufficient data on the risks. Many highly exposed low-income governments and their citizens thus will not, at least not in the short term, be a part of an insurance programme. To include those who face uninsurable risks and those who are not able to insure, a second tier of support may well need to be considered (see Figure 1).

It should be emphasized that limiting support to sudden- and slow-onset weather risks may not fully meet the intent of the UNFCCC as expressed in Article 4.8, which specifically calls for actions to address the needs and concerns of small-island countries and countries with low-lying coastal areas exposed to gradual sea-level rise (United Nations, 1992). This proposal does not cover gradual (and, in terms of occurrence, predictable) risks; rather, it is meant to complement the AOSIS proposal, which is designed to compensate the victims of small-island states and low-lying developing countries for sea-level rise.

Support for persons or governments facing stochastic risks (as opposed to gradual impacts) for which no insurance is available could follow some of the principles set out by the AOSIS and Germanwatch proposals. Each advocates a fund fully financed by industrialized countries that provides post-event assistance contingent on pre-event risk or impact management efforts. There is one main drawback of these proposals: their wide scale of operations, including risk/property assessments and individual claim settling, limits their practicality. In contrast to the Germanwatch proposal, which would provide post-disaster funds by assessing claims, we suggest that an administrating authority should allocate swift post-event support based on pre-negotiated terms, but not based on the assessment of loss claims.

An appealing feature of both the AOSIS and Germanwatch proposed schemes is their attention to prevention by reducing vulnerability and the uncontrolled exposure of people and assets to hazards. Likewise, a second tier of support for our proposed strategy might consider imposing a criterion of eligibility requiring the qualifying country to demonstrate credible efforts at reducing, insuring and managing disaster and weather-related risks. These efforts would ideally be based on stakeholder-led efforts by the recipients to develop and implement risk management programmes that are designed within their own institutions and not imposed by an outside authority.

An important precedent for this second tier is the World Bank's planned Global Facility for Disaster Reduction and Recovery (GFDRR). While still under development, it is envisaged that one level of operation will provide technical assistance for assessing and mainstreaming disaster risk into development planning with country-wide risk management strategies; at another level, the GFDRR would be a stand-by facility to provide quick relief funding after an event. To some extent, this relief would be contingent on implemented risk management strategies (World Bank, 2006).

5. Challenges and opportunities

5.1. Challenges

Despite tangible benefits and novel prospects for supporting adaptation to the impacts of climate change through insurance-related instruments, there are many challenges and opportunities to negotiating financial resources for this purpose. A major stumbling block has been a call by the Organization of Petroleum Exporting Countries (OPEC) for parallel treatment (ECO, 2004). Just as AOSIS seeks financial assistance, insurance and the transfer of technologies under the UNFCCC to help small-island states and low-lying nations adapt to a changing climate, OPEC seeks compensation for lost revenues from the reduced use of fossil fuel. Although seemingly unrelated, negotiations on these two issues have long been intertwined and thus deadlocked. The linkage continues despite views that these two categories of impacts are different in kind, scope and temporal aspects, and different in the nature of the communities impacted (Barnett and Dessai, 2002). Vulnerable communities exposed to sea-level rise, threats to their water supplies or an increased intensity of hazards have played little role in creating these physical threats. In sharp contrast, the implementation of response measures can be expected to affect economies that have played a direct role in contributing to climate change (and that have benefited from this role), through fossil-fuel production or fossil-fuel consumption (for a detailed discussion, see Linnerooth-Bayer et al., 2006).

At the Seventh Conference of the Parties (COP-7) to the UNFCCC in Marrakech in 2001, it was agreed that predictable and adequate levels of funding shall be made available to developing

country Parties to meet Convention commitments. It was also agreed that developed countries should provide resources through three newly created funds (Special Climate Change Fund (SCCF), Least Developed Country Fund, and Adaptation Fund), the Global Environment Facility, and bilateral and multilateral sources (UNFCCC, 2001). The creation of the SCCF was important in signalling a degree of political will to implement Article 4.8 and its related Kyoto Protocol provisions for the broad group of developing countries. The SCCF provides support for specified adaptation measures, including capacity building and institutional capacity for preventive measures, planning, preparedness and management of disasters related to climate change (UNFCCC, 2001).

The Marrakech funds are financed from diverse sources, including voluntary payments usually taken from Official Development Assistance (ODA) and the proceeds from a levy on the Clean Development Mechanism (CDM). Contributions to these funds have been made since Marrakech (Mace, 2005; Verheyen, 2005), but substantial funding has yet to be committed. The sentiment, especially on the part of developing countries, is that the COP has not created sufficient resources to address adaptation, despite the ample evidence of climate impacts in progress (Kantha et al., 2006). Alternative sources have also been proposed; for example, an international air travel adaptation levy (Müller and Hepburn, 2006).

5.2. Opportunities

It seems evident that any more ambitious form of support for insurance-related instruments in developing countries could benefit by partnering with financial institutions and donor organizations with similar aims. A consortium could link the proactive disaster-support agendas of multiple institutions, including international financial institutions (such as the World Bank, the InterAmerican Development Bank), bilateral donors (such as the UK Department for International Development (DFID) and the German Ministry for Economic Cooperation and Development (BMZ)), international organizations (such as the Organization for Economic Development (OECD), the United Nations Development Programme (UNDP) and the DG Development of the European Commission), reinsurers (such as Munich Re), and non-governmental organizations (such as Red Cross/Red Crescent and OXFAM). Coupling with other initiatives raises the question of the scope of climate adaptation funds committed to climate risk reduction. If funds for a climate insurance programme are pooled with support for seismic and other non-climate risks, this would have the advantage of increasing the global diversification and global benefits of the envisaged pool.

Two recent projects by the World Bank are especially promising as a potential link with the broad programme of support outlined in this proposal. As discussed above, the Global Fund for Disaster Reduction and Recovery (GFDRR) will provide technical assistance for mainstreaming disaster risk and serve as a stand-by facility to provide quick relief funding. A Global Insurance Index Facility (GIIF) sponsored by, among others, the European Commission, is in the planning stages. This facility, as envisaged, will provide backup capital for index-based insurance covering weather and disaster risks in developing countries to assure financial protection for small risk-transfer transactions. By constructing a diversified portfolio of developing country risks, the facility would leverage risk transfer and thus jump-start the development of risk transfer markets in countries with underdeveloped insurance markets (World Bank, 2005c). It is anticipated that other donor and financial institutions will join the GIIF initiative.

Another opportunity and challenge is to link insurance instruments with risk-reduction measures, and thus contribute directly to ‘adaptation’ (note that reducing long-term losses through a timely infusion of post-disaster capital also contributes to adaptation). Cleverly designed insurance systems can explicitly reward risk reduction behaviour with reduced premiums. With important exceptions, however, experience with incentive-compatible insurance is disappointing; yet, this record might be improved by setting risk reduction as a prerequisite for offering support. It should be emphasized that substituting pre-disaster support for post-disaster relief inevitably draws attention to the risks and opportunities for their reduction, and coupling insurance with risk management may have great potential for mitigating the human and economic losses from disasters (Linnerooth-Bayer et al., 2005).

6. Summary and issues

The importance of overcoming the impediments to progress on insurance-related actions within the UNFCCC and putting concrete proposals on the negotiating agenda has been emphasized by the first Executive Director of the UNFCCC, who considers implementation of Article 4.8 as ‘one of the most critical aspects’ of the climate-change negotiations (Capdevila, 2000, quoted in Barnett and Dessai, 2002). This article has made a tentative step in this direction by proposing the creation of a two-tiered climate insurance strategy, which would specialize in supporting developing country insurance-related initiatives and providing disaster relief for uninsured and uninsurable climate risks. The strategy could be implemented by a stand-alone mechanism, or it could leverage its support by partnering with other donor initiatives, such as the recent multi-donor initiative to create a Global Index Insurance Facility. Alternatively, it could be ‘mainstreamed’ into broader disaster risk management activities, perhaps by partnering with the World Bank’s Global Facility for Disaster Reduction and Recovery.

Whatever institutional form the proposed climate insurance programme takes, its purpose would be to enable the establishment of public/private safety nets for stochastic shocks by making use of insurance instruments that are affordable in developing countries. In a second tier, the strategy could additionally, under specified conditions, provide disaster relief to those without an opportunity to join an insurance pool. A main advantage of this proposed two-tier strategy is that it takes advantage of the many opportunities provided by new and conventional insurance instruments, and combines individual, governmental and international responsibility. Moreover, its feasibility is demonstrated by donor-supported insurance programmes already under way. Finally, it offers opportunities for linking with other donor initiatives, providing incentives for loss reduction (adaptation) and targeting the most vulnerable.

The intent of this proposed strategy is not to provide a concrete proposal for negotiation, but rather to outline possibilities for further discussion. Many details and issues need careful consideration before a concrete proposal could be offered to the post-2012 negotiations. Most fundamentally, the institutional design of both tiers of this proposed strategy must be resolved: Should a climate insurance strategy take the form of an independent initiative, a partnered initiative, or simply a contribution to a disaster risk management fund, such as those recently set in train by the World Bank? There are also unresolved issues regarding the extent of support. If support is required to be commensurate with the incremental risk from climate change, it will be difficult to fashion a scientifically credible programme; alternatively, if support takes the form of a no-regrets strategy that integrates adaptation to climate change with adaptation to ‘normal’ climate variability, this

two-tiered strategy, with its shared responsibility, offers many opportunities for differential levels of financial assistance. Finally, any discussion on a concrete proposal for allocating adaptation funds should necessarily be coupled with a discussion on the sources of this funding.

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