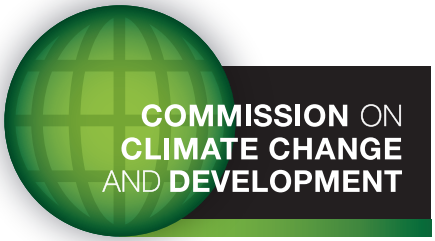

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The Role of Risk Transfer and Insurance in Disaster Risk Reduction and Climate Change Adaption

Margaret Arnold
ProVention Consortium

www.ccdcommission.org

This paper has been commissioned by the Commission on Climate Change. Its purpose is to function as food-for-thought for the work of the Commission. The Commission is not responsible for views expressed in this paper.

The Commission on Climate Change and Development

The Commission is an international commission initiated and financed by the Swedish Government. The purpose of the Commission is to propose ways to integrate risk reduction and adaptation to climate change into the development and poverty reduction plans of poor countries. It is also to present proposals for how to design development cooperation programs that take account of climate impacts and the risk of disasters. The Commission will issue its report in spring 2009. The commissioners serve in their personal capacity. The Commission is supported by a Secretariat based in Stockholm, Sweden.

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Secretariat of the Commission
Johan Schaar (Sweden)
Postal address: Kräftriket 2B, SE 106 91
Visitors' address: Kräftriket 2B, SE-106 91
E-mail: info@cdcommission.org
Website: www.ccdcommission.org

Policy Brief for the Commission on Climate Change and Development

The role of risk transfer and insurance in disaster risk reduction and climate change adaptation[1]

Margaret Arnold, ProVention Consortium
January 2008

Summary: *This policy brief provides a general overview of the state of the art regarding insurance and the financing of natural disaster risk in developing countries. As the Commission on Climate Change and Development is focused on poverty reduction, the main emphasis of this brief is disaster risk transfer mechanisms for the poor, specifically microinsurance. The core message is that insurance and other ex ante risk financing mechanisms form a critical part of a comprehensive disaster risk management strategy, and have the potential to play an important role in disaster risk reduction (DRR) and climate change adaptation (CCA). Financial products are not enough on their own, however, and must be tied to efforts and incentives for investment in risk reduction. A number of important initiatives have been undertaken in recent years to promote national programs for the protection of public assets and catastrophe insurance pools for homeowners. These mechanisms do not reach the poor. While microinsurance holds much potential, concerted research and more experience are needed to develop a sustainable model in order to reach the poorest and ensure equitable and efficient ways to manage and reduce risk.*

Proactive risk financing initiatives are being promoted at several levels. Reaching the poor remains a challenge.

For decades, the financing of disasters in developing countries has relied on a reactive approach, consisting of the diversion of funds from domestic budgets and extensive financing from international donors. Such "ex post" funding approaches are inefficient, often poorly targeted, and insufficient. Moreover, they provide no incentives for proactive risk reduction measures such as improved urban planning, higher construction standards, etc.

Reactive approaches to risk financing are becoming increasingly unsustainable due to a number of factors. Vulnerability is increasing as emerging economies grow and accumulate more assets. Poorly planned urbanization, continued environmental degradation, and population growth contribute to further increases in vulnerability and growing disaster losses. The IPCC's Fourth Assessment Report confirms that climate change will bring more frequent and more intense extreme weather events. The increase in hazard exposure and in vulnerability point to a continuing trend of increasing losses due to natural disasters. With the capacity and willingness of donors to fund disaster relief and reconstruction ultimately constrained, the funding gaps between available donor resources and post-disaster funding will grow if disaster prone countries do not engage in risk reduction and pre-disaster risk financing.

Insurance markets in the majority of developing countries are undeveloped, and coverage for natural disasters is extremely limited. Where hazard coverage exists, it is usually limited to major industrial and commercial properties, and some wealthier households. The demand for risk transfer instruments in emerging markets is often constrained by market gaps, lack of regulatory frameworks, lacking data on disaster risk, a lack of a culture of risk financing, and the reluctance of large reinsurance market players to invest in the development of small risk markets.

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[1] The findings on disaster micro insurance schemes discussed here are adapted from a ProVention Consortium/IIASA review of microinsurance programs, *Disaster Insurance for the Poor? A Review of Microinsurance for Natural Disaster Risks in Developing Countries*, July 2006.

For a number of years, efforts have been undertaken to promote a more proactive approach among to risk financing in developing countries. A number of examples come from World Bank-led efforts, including the provision of technical support to Mexico in issuing a cat bond,[2] contingency financing arrangements in Colombia, the Caribbean Catastrophe Risk Insurance Facility (CCRIF, the first regional institution which allows the eighteen participating countries to pool their risk and save on individual premium payments), and the Turkish Catastrophe Insurance Pool (TCIP, a mandatory earthquake insurance pool for homeowners).

These initiatives provide much needed, immediate liquidity after a disaster for more effective government response, and some relief of the fiscal burden placed on governments due to disaster impacts. They constitute critical steps in promoting more proactive risk management strategy that includes preparing for disaster impacts and planning for the response. These formal mechanisms, however, do not address the issue of reaching the poor, who are consistently the most affected by disasters.

A limited number of microinsurance schemes for disaster risk are available in developing countries.

A wide range of microfinance services have been offered to low-income households for several decades. Overtime, these have included microinsurance products, mainly for independent risks such as funeral expenses, health and loss of life.

With little to no access to formal insurance mechanisms for disasters, the poor are forced to self insure, depleting their savings when disaster strikes. Other consumption-smoothing strategies include taking emergency loans from microcredit institutions or money lenders and relying on family or community support. Community support measures may break down in times of disaster, as entire communities are affected at once. Without adequate coping strategies, poor households are locked into the poverty cycle, taking out high-interest loans or defaulting on existing loans, selling assets and livestock, or engaging in low-risk, low-yield farming to lessen their exposure to extreme events. Reliance on government or donor assistance is often inadequate, as this support can be ad hoc, poorly targeted, and slow in disbursing. Moreover, disaster assistance can discourage governments and individuals from taking advantage of the high returns of preventive action.

Microinsurance can help to break this cycle by providing low-income households, farmers, and businesses with rapid access to post-disaster liquidity, thus protecting their livelihoods and providing for reconstruction. As insured households and farms are more creditworthy, insurance can also promote investments in productive assets and higher-risk/higher-yield crops. In addition, insurance has the potential to encourage investment in disaster prevention if insurers offer lower premiums to reward risk-reducing behavior.

Recent years has brought growing interest from private sector insurance firms in microinsurance. Primary insurers at the country level play a key role in most microinsurance schemes, by channelling the risk to commercial markets and allowing the intermediary agency to focus on client relations and support. Regulatory changes implemented in India over the last several years have increased the incentives for insurance companies to participate in such schemes. Internationally there is also increasing interest from reinsurance companies like Swiss Re, which has recently developed a partnership with Millennium Promise for a Climate

[2] Cat bonds, or catastrophe bonds, were developed after Hurricane Andrew hit the coast of Florida in 1992 and devastated the insurance industry. They are risk-linked securities issues by a sponsor (e.g., an insurance company, or government) and include a specified trigger (e.g., a certain category hurricane hitting the Florida coast). Investors buy the bond and are paid a high interest rate, which makes them attractive. However, they are also riskier than other types of bonds. If the cat bond is triggered, then the bondholders lose their investment. The principal initially paid by the investors is forgiven, and is instead used by the cat bond sponsor to cover their losses from the disaster event.

Adaptation Development Program to develop risk transfer tools for Millennium Villages against the effects of adverse weather.

Micro disaster insurance can cover sudden-onset events, such as earthquakes, floods, and cyclones, as well as slow-onset events, such as droughts. Traditional microinsurance programs have consisted of indemnity insurance, which pays claims based on actual losses and requires an extensive network of claims adjusters who assess individual losses following an event. Indemnity schemes include those in India offered by NGOs in conjunction with insurance companies in two states. These schemes build on microinsurance arrangements for independent risks, such as unemployment, fire and accidents, by extending cover to loss of life, property or livestock due to natural disaster events. Coverage for property losses due to floods, earthquakes, cyclone and other natural calamities is offered to groups such as women with a minimum group size of 250, or to community groups for managing the impacts of disasters post-event. Clients can also engage in risk reduction training for a small fee.

More recently, index-based schemes have emerged, which feature contracts written against a physical trigger (parametric insurance). In the case of weather derivatives for crop risks, farmers collect insurance compensation if the index reaches a certain measure or "trigger," regardless of actual losses. Index-based weather derivative schemes have been undertaken in India, Ethiopia, Malawi, Nicaragua, Peru and Ukraine. Contracts are written against a physical trigger, for example, severe rainfall measured at a regional weather station. Contracts are designed by insurance companies and sold by rural development banks, farm cooperatives or microfinance organizations. Since payouts are not coupled with individual loss experience, farmers have an incentive to engage in loss reduction measures, for example, switching to a more robust crop variant. These schemes may offer a viable alternative to traditional crop insurance, which has failed in many countries due to the high costs associated with settling claims on a case-by-case basis. The major advantages of index-based insurance are the reduction of moral hazard and of transaction costs. Index-based mechanisms are also more transparent, as they are based on a physical trigger and the payout is fixed in advance. The major downside of index insurance is the basis risk: if the trigger is insufficiently correlated with the losses experienced then no payout may occur, even if the losses are substantial.

To date index schemes have relied on the existence of networks of rainfall meters and have been primarily focused on crop insurance. The World Bank is currently testing the use of triggers based on remote sensing for flood schemes in Thailand and Vietnam that would allow wider application of index schemes and include inundation and not just precipitation with the coverage. The World Bank has also worked with the Government of Mongolia to develop a livestock insurance program based on measures of animal mortality rates, which raises the hope of extending index schemes to other types of non-agricultural livelihoods and small and medium-size enterprises.

Another promising initiative is the Global Index Reinsurance Facility, which is being developed by the World Bank and the International Finance Corporation with a private sector reinsurer and donors. The GIRF will underwrite indexable weather and other indexable natural catastrophe risks in developing countries and also includes a technical assistance pool funded by donors to develop the technical parameters of the business.

Micro disaster insurance shows great potential, but faces several challenges before it becomes a sustainable mechanism for effective risk management for the poor.

The ProVention Consortium and the International Institute of Applied Systems Analysis conducted a desk review of thirteen micro disaster insurance schemes, and analyzed them in terms of their financial viability, affordability, governance, and their contribution to risk reduction. The study found that microinsurance holds great potential to protect the poor from disaster shocks. Existing schemes are securing livelihoods and supporting reconstruction and recovery for poor households. Index-based schemes have demonstrated their value in improving the creditworthiness of farmers. Some schemes are attempting to couple insurance with capacity building and incentives for risk reduction.

At the same time, however, disasters present a special challenge to microinsurers because of the covariant nature of the risks. Covariant risks are those that affect an entire community or region at the same time – as claims must be paid to all members in the risk pool, it threatens the solvency of the insurer. Thus, covariant risks require careful diversification and reinsurance to remain solvent. Due to the high costs of capital and reinsurance, it is difficult to offer low cost catastrophe coverage. Local, national and international stakeholders, therefore, face special challenges in ensuring the long-term viability of microinsurance schemes, and developing them as an effective climate and disaster risk management tool for the poor.

Financial viability. Without sufficient back-up capital through reserves or reinsurance and/or sufficient geographic diversification, the payment of claims is jeopardized and thus the viability and credibility of the microinsurance program. Disaster insurance schemes should therefore be based on sound estimates of low-probability, high-consequence risks so that premiums can be priced and the requisite capital reserves or reinsurance can be assured. The science underlying the models and risk estimates must be independent, verifiable and viewed as reliable by insurers, investors and donors. Where there is a high degree of ambiguity with the risk estimates of extreme events, international donors may need to provide incentives for private sector involvement in such schemes.

In the longer-term, climate change raises the additional challenge of insurability decreasing as the magnitude of damages continues to increase. UNEP's Finance Initiative reports that by 2025, insurers may withdraw from some markets as the risks become too high for the pool of premium available. This has happened periodically in the United States. CERES, a US-based NGO, has identified a growing move by insurers to reduce coverage in the coastal zone. In this connection, it would be beneficial to explore further the use of alternative risk transfer products such as cat bonds, which pass the risk onto investors in the capital markets rather than to reinsurers.[3]

Affordability. Microinsurance needs to be affordable to low-income clients. Disaster insurance premiums include the costs of handling many small contracts, distributing the product often to remote areas, as well as assuring sufficient capital to cover dependent claims. These elements combine to make insurance more costly than the purchaser's expected losses from the insured events. Thus, a major dilemma is to offer premiums that can be paid by the very poor in high-risk areas.

There are several ways to reduce disaster insurance premiums. The most obvious is subsidies from public authorities, international donors or those at lower risk in the insurance pool (cross subsidies in the insurance system). There are many examples in developed and transition countries. The Hungarian government is providing subsidies to poor households as part of a recently legislated flood insurance pool. In the UK extensive cross subsidies in the private flood insurance system make it affordable to low-income households. In developing countries, transaction costs can be minimized by offering policies to groups or communities and through established microfinance institutions. The expense of claims handling can be dramatically reduced through index-based instruments. Finally, the high costs of capital reserves and reinsurance can be lowered through government or donor provision of reinsurance. An example is the Turkish Catastrophe Insurance Pool, where the World Bank reinsures a layer of risk for the pool.

The issue of subsidies for insurance premiums is often a topic of heated debate. While some caution against shifting responsibility away from national or international solidarity for the poor, others warn against the negative incentives promoted by some types of subsidies. To be effective subsidies need to be carefully targeted to address specific market gaps within the overall cost structure and to ensure movement toward market strategies. The issue of liability and accountability of polluters at the international level raises the question of whether the poor

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[3] UNEP Finance Initiative. "Adaptation and Vulnerability to Climate Change: The Role of the Finance Sector". *CEO Briefing*, November 2006.

should bear the burden of increased natural disasters caused by industrialized countries. It has been suggested that microinsurance schemes could offer a mechanism for transferring funds from industrialized countries to poor communities as a form of liability insurance. However, while microinsurance is promoted as an efficient self-help and risk sharing strategy, there are questions about whether risk transfer in general is an efficient means of such financial transfer.

The international donor community can play an important role in ensuring the financial robustness of developing country insurance providers. By providing technical assistance and financial support to help make these instruments affordable to the poor, both the donors and the recipients stand to gain, especially if the instruments can be designed to encourage preventive measures. Pre-disaster assistance would leverage limited disaster aid budgets, free recipient countries from the vagaries of post-disaster assistance, increase funds for disaster recovery, and (possibly) provide incentives for risk reduction.

Risk and poverty reduction. Critics of disaster insurance point to the "moral hazard" problem, which asserts that households and businesses are prone to take less precaution if their assets or livelihoods are insured. This same problem plays out at the macro level, with donors providing the majority of disaster loss financing in developing countries. If microinsurance is to become a welfare-enhancing instrument, it must contribute to risk reduction. While some schemes try to embed insurance within a disaster risk management framework***,*** direct links and incentives on the part of current microinsurance programs to reduce the direct losses from disasters are lacking***.*** Skeptics warn that insurance may conversely present disincentives to taking proactive risk-reduction measures. Index-based schemes offer a possible exception, insofar as a physical trigger minimizes such moral hazard. Nonetheless, the challenge of linking insurance to prevention underlines the importance of integrating microinsurance into risk management programs that combine regulatory and citizen oversight to assure incentives and effective regulations.

In a broader sense, some promoters of microinsurance claim that index-based schemes can contribute to poverty reduction by enabling productive investment on the part of low-income households. However, to date there is insufficient evidence regarding the relationship between microinsurance and shifts to higher-risk/higher-yield activities.

Recommendations:

For micro disaster insurance to serve as a sustainable and effective risk management mechanism for the poor, the current pilot and fledgling programs will need to be scaled up to cover the large number of low-income households and farms facing risks from natural disasters. While there is great potential, there is insufficient experience with current programs to judge their future viability.

- ∞ Academics and other partners should be engaged to collect further evidence and elicit lessons from operating experiences related to the value of microinsurance as a pro-poor instrument.

Existing programs demonstrate some innovative ideas and creative alliances to deal with market failures and other issues. Safety nets for high-risk poor communities will not work without public-private partnerships, as no one partner can operate without the assistance of the others: highly exposed and fiscally unstable developing country governments cannot fully absorb the risks; informal community solidarity and family systems are overtaxed by large covariant losses; and private insurers cannot offer low-cost policies, given the need for expensive reinsurance and large uncertainties in the projected loss estimates.

- ∞ A multi-stakeholder approach should be promoted in pioneering microinsurance programs to develop a sustainable model for reaching the poor, including

NGO/community groups, microfinance organizations, government regulators, entrepreneurs, donors, IFIs, and private insurers.

While there is a lot of hope that insurance can become an important adaptation and risk management tool, climate change will present new challenges, as disaster impacts continue to grow, affecting the insurability of assets.

- A concerted effort among climate change specialists, microinsurance and risk-transfer experts, the research community, and representatives from civil society, governments, and bilateral and multilateral donor institutions is needed to consider the implications of future climate scenarios on microinsurance programs.