

Vulnerable Countries and People

How Disaster Risk Reduction & Insurance
Can Help Manage the Risks of Climate Change

by Koko Warner, Thomas Loster, Michael Zissener,
Soenke Kreft, Joanne Linnerooth-Bayer, Christoph Bals,
Peter Hoeppe, Eugene Gurenko, Ian Burton, Armin Haas

with contributions from Michael Anthony,
Matthias Garschagen, Philine Oft, Jerry Skees, PNT Tugaga
and Simon Young

foreword

Insurance approaches have been mentioned in the United Nations Framework Convention on Climate Change (UNFCCC) climate negotiations since the Convention was framed in the early 1990s. More recently, the issue has received renewed attention in the Kyoto Protocol, the Bali Action Plan, and in discussions leading up to the 2009 climate negotiations in Copenhagen. The importance of linking disaster risk reduction and any insurance approaches has risen, along with an increase in weather-related extreme events across the globe.

Delegates to the UNFCCC have expressed a willingness to consider disaster risk reduction and insurance as having a role to play in the post-2012 climate adaptation framework. They have requested both more information and examples of how this set of tools can help facilitate adaptation. Most compelling of all, delegates have asked how disaster risk reduction and insurance can help countries and people negatively affected by extreme events related to climate change.

This Policy Brief shares interviews with people around the world affected by weather-related natural hazards. In their own words, these people explain what they need in terms of disaster risk reduction, and how insurance might help reduce the damage extreme events cause in their lives. The Policy Brief helps delegates understand more clearly the links between the Munich Climate Insurance Initiative's (MCII) proposal for climate risk insurance and "real people" who face these risks.

We hope that this Policy Brief is useful to climate negotiators and other stakeholders in the discussions on adaptation leading up to and following COP 15 in Copenhagen.

Sincerely,



Dr Koko Warner

*MCII Executive Board Member, Munich Climate Insurance Initiative
Hosted at the United Nations University
Institute for Environment and Human Security (UNU-EHS)
in Bonn, Germany*

About MCII

The Munich Climate Insurance Initiative (MCII) was launched in April 2005 in response to the growing realization that insurance-related solutions can play a role in adaptation to climate change, as advocated in the Framework Convention and the Kyoto Protocol. This initiative brings together insurers, experts on climate change and adaptation, NGOs, and policy researchers who intend finding solutions to the risks posed by climate change.

MCII provides a forum and gathering point for insurance-related expertise on climate change impact issues. MCII is hosted at the United Nations University Institute for Environment and Human Security (UNU-EHS) in Bonn, Germany.

Website: www.climate-insurance.org | Contact: info@climate-insurance.org

Introduction:

Parties to the UNFCCC have committed themselves to considering the special needs and concerns of developing countries resulting from the adverse effects of climate change in the area of insurance. The needs of small island developing states (SIDS) are particularly highlighted for attention, due to their unique geographic features and exposure, and unique vulnerability. Article 4.8 of the Convention, Article 3.14 of the Kyoto Protocol, and the Bali Action Plan propose actions, including insurance, to meet the specific needs and concerns of developing countries in adapting to climate change.

How to help vulnerable countries manage climate-related disaster risks?

Many governments and organizations are exploring how disaster risk reduction and risk sharing approaches might help countries particularly vulnerable to climate change impacts adapt. A central concern, and the focus of this paper, is how to make such measures accessible and affordable to vulnerable people in developing countries in order to support them in their efforts to reduce risk and adapt to climate change.

Increasing frequency and intensity of weather-related extreme events

In recent years there have been more and more indicators that climatic change already influences the frequency and intensity of natural catastrophes. If the scientific global climate models are accurate, the present problems will be magnified in the near future. These models suggest that we should expect:

- Increase in the frequency and severity of atmospheric extreme events such as rain, flash floods, heat waves, droughts, bush fires, tropical and extra tropical cyclones, tornados, hailstorms, and storm surges in many parts of the world.
- New exposures like tropical cyclones in the South Atlantic (or other areas where they have not occurred until recently) or monsoon patterns changing rainfall in large areas over Asia and other parts of the world.
- More extensive damage, economic, social, and environmental impacts from weather-related disasters.

More than three-quarters of recent economic losses caused by natural hazards can be attributed to windstorms, floods, droughts and other climate-

MCII's proposal is important because it designs risk reduction and insurance to:

• Reduce risk:

MCII's plan helps vulnerable people and vulnerable developing countries prioritize and reduce risk with the support of the international community

• Promote adaptation:

MCII's plan provides nation states the incentive to include disaster risk reduction in their adaptation plans and to implement these plans

• Comprehensive approach to risk management:

Address risk at low, medium and high levels and the needs for risk reduction and risk transfer at local, sub-national, and national levels – a comprehensive approach to help developing countries and people to better manage climate-related risks

related hazards, which appear to be increasing at a greater rate than geophysical disasters. This trend can be largely attributed to changes in land use and increasing concentration of people and capital in vulnerable areas, for example, in coastal regions exposed to windstorms and in fertile river basins exposed to floods. Modern societies and critical infrastructure upon which they depend are increasingly vulnerable.

As indicated by the greater increase in weather-related disasters compared to geophysical disasters, climate change also appears to be a factor in increased disaster losses. The Intergovernmental Panel on Climate Change (IPCC) has predicted that climate change will increase weather variability as well as the intensity and frequency of weather-related extremes. There is also mounting evidence that climate change is contributing to increasing current risks.

These increasing hazard-related risks - associated with both climate change and social and economic developments - create a substantial additional burden for sustainable development. These risks demand attention, particularly since the negative impacts of climate change could hinder progress towards achieving the Millennium Development Goals.

Due to the lack of insurance, combined with exhausted tax bases, high levels of indebtedness and limited donor assistance, many highly exposed developing countries cannot raise sufficient capital to replace or repair damaged assets and restore livelihoods following major disasters, exacerbating the impacts of disaster shocks on poverty and development.

The decisive question today

The decisive question today is which strategies we should follow to mitigate and adapt to climate change. Increasingly, a focus among practitioner and policy communities has been on the management of weather-related climate change impacts like natural hazards, and the potential complementary roles of risk reduction and risk sharing tools including insurance.

This Policy Brief considers the elements of the MCII proposal to include disaster risk reduction and insurance in the Copenhagen Agreed Outcome. It examines the degree to which such a proposal can help developing countries and poor people within those countries adapt to climate change impacts. The MCII proposal includes two complementary pillars: disaster risk reduction and insurance.

Together these two pillars tackle acute climate-related risks at low, medium and high levels. Such a Climate Risk Management Module (CRMM) would be paid for by the international community, based on the principle of common but differentiated responsibility and in accordance with the decisions of the parties, and sound risk management principles. Under such a plan, the costs for most vulnerable countries that have not contributed to climate change would be borne totally or nearly totally by developed nations.

Vulnerable countries and the poor suffer most.

In the past quarter-century over 95% of deaths from natural disasters occurred in developing countries, and direct economic losses (averaging USD 100 billion per annum in the last decade) in relation to national income were more than twice as high in low-income as opposed to high-income countries.

These disaster statistics do not (for the most part) reflect long-term indirect losses, which can be very significant, particularly in countries with little capacity to respond and recover.

Not only are there considerable differences in the human and economic burden of disasters in developed versus developing countries, but also in insurance cover.

In the richest countries about 30% of losses in the period 1980-2004 (totaling about 3.7% of GNP) were insured; in low-income countries, only about 1% of losses (amounting to 12.9% of GNP) were insured.

Source: Warner and Spiegel 2009.

This Policy Brief now examines the different elements of the MCII proposal and how these elements can help developing countries and vulnerable people within those countries.



Profile

Name:
T.B. Nguyen

Location:
Can Tho, Mekong Delta, Vietnam

Occupation:
*Craftsman
(boat repair)*

Risk exposure:
*Typhoon, heavy rain-
fall, flooding*



Nguyen's story:

'My family has been living in this place for more than 100 years and I continue the boat repair business of my father and grandfather. During the rainy season we usually have flooding in our house and shop during high tide, hence, the water comes into the shop twice per day.

We, personally, have experienced a rise in heavy rain and the average water levels over the last years. This worries me because I do not really know what to expect and how to deal with it. Already today I often have to secure the roof with wooden planks when there are strong winds but if the storms really become stronger in the future, I am not sure if the planks will be a sufficient protection or if my entire shop could be destroyed. That would be disastrous for my family and our 16 employees.

Repairing only the roof would cost around 10 Million Vietnam Dong (550 USD). Our community needs help to reduce the risks we face. If we had this help, I am sure that my business and our livelihoods in general could be much safer in the future.'

Courtesy of Matthias Garschagen, UNU-EHS (2009)







Profile

Name:
Miguel

Location:
Village of Noma
District of Santo
Domingo, Province
Morropón, Región
Piura, Peru

Occupation:
Farmer

Risk exposure:
Drought, flooding,
landslides, hail, frost



Miguel's story:

'I live in the highlands of Peru. During the past El Niños, I suffered from landslides and flooding on my land and part of our coffee production was damaged. We needed many years to recover from the loss and my family suffered a lot.

Today we are just getting by – every time my crops are destroyed by a disaster, I have to go into debt – we need help to reduce the risks in our region. What is missing are measures to prevent the landslides and flooding from destroying our fields, technical assistance to help me increase and know how to manage my crops and water better.

If my village had some kind of safety net that would help us adapt in many ways: I could qualify for a loan in case of a severe decline in the yields and we could improve our terraces so they do not slide away. If we had help with these simple measures, we could better adapt to the effects of El Niño in the future.'

Courtesy of Philine Oft, UNU-EHS (2009)

The MCII disaster risk reduction pillar addresses the needs of Nguyen and Miguel.

It helps developing countries and vulnerable communities realize their disaster risk reduction priorities, in line with the Hyogo Framework for Action.

MCII's proposal links disaster risk reduction and insurance

Investing in disaster risk reduction measures is the first step toward adaptation. Preventing or minimizing losses is the bedrock of effective risk management. Disaster risk reduction and prevention can take many forms: reducing exposure to risks (e.g. land-use planning); reducing vulnerability (e.g. retrofitting buildings); or creating institutions for better response (e.g. emergency planning). These measures can directly improve the safety and quality of life for many affected and vulnerable people in developing countries. Disaster risk reduction measures are therefore appropriate to help counteract the added risk arising from climate change.

Although this message is widely accepted, countries and communities within them still have difficulties in implementing effective disaster risk reduction. Often governments and communities know what kinds of measures need to be taken to reduce disaster risks - but they are overwhelmed by day to day development priorities such as maintaining schools and building roads, providing basic sanitation and health care, and feeding their populations. Often development assistance (in the forms of grants, loans, or Official Development Assistance (ODA)) is not available to undertake risk reduction measures. Many countries only have access to funding for risk management after a bigger event stroke, and only if it is large enough to capture international media and donor attention.

MCII's proposal addresses this gap. MCII proposes that the international community makes funding available for developing countries to incorporate disaster risk reduction and the principles of the Hyogo Framework into their national adaptation plans. Further, MCII suggests ongoing support to these countries to help them implement and maintain their disaster risk management plans in a sustainable way. As countries and communities show ongoing efforts to reduce risks they can become eligible for cover by risk sharing schemes like insurance. Low-level risks, such as frequently recurring dry seasons or heavy rains can be cost effectively met by activities supported by the Disaster Risk Reduction Pillar. MCII's proposal cannot solve all of the complex development challenges today; but the proposal does incentivize and strengthen disaster risk reduction in vulnerable developing countries.

Disaster risk reduction opens the door for climate risk insurance and other risk sharing opportunities

MCII's proposed Disaster Risk Reduction Pillar links carefully designed insurance instruments to risk

reduction efforts. Progress in prevention and risk reduction helps countries qualify for participation in the Insurance Pillar.

Linking disaster risk reduction and insurance mechanisms for adaptation:

As a more direct route to promoting adaptation, the provision of different kinds of insurance can be made conditional on risk-reduction measures.

Example: In the Ethiopian village of Adi Ha, farmers can purchase a microinsurance product to protect them against drought loss to their teff crop.

Farmers not able to afford insurance can join a program that allows them to pay for part of their insurance premium with labor in the off-season.

Oxfam America is considering orienting the work program to projects that reduce drought risk.

Thus, the donor-funded "food for work" and disaster aid program is re-designed to a donor-funded "insurance for risk reduction work" program.



Profile

Name:
Lkhagva

Location:
Khentii province,
Mongolia

Occupation:
Herder

Risk exposure:
Winter storms, frost,
dzhud (heavy snowfall
which denies the stock
to graze)



Lkhagva's story:

'Herder's main source of income comes from animals and animal products. Some 80 % of farmers have cattle. When their value decreases in the market, herders' life gets harder. If they begin to lose their animals, herders feel terrible. From time to time, natural disasters such as extremely cold winters occur and blow out all our efforts. I have been in harsh weather conditions many times: lack of pasture land, absence of water, absence of grass, and poor health of animals that would not be able to go to a better pasture land and even times when we have nothing to feed animals. Weather conditions became more unpredictable and disasters may occur anytime now. For example, we had a harsh wind in May of 2008. Many provinces and herders lost their livestock animals. As a consequence, many herder families became poor. Herders should get plenty of hays and repair their animal shelters on regular basis in order not to fail the weather test. In addition, I suggest herders get their livestock insured based on my personal experience.

I have got my livestock insured for the last three years and I am happy to get an indemnity payment for the recent disaster. I think more and more herders should get their livestock insured on regular basis. This disaster occurred for the second year I got my animals insured. I have received a big enough payment to cover my expenses to search my livestock lost and to restock my herd.'

Courtesy of Jerry Skees, University of Kentucky and GlobalAgRisk (2009)



Profile

Name:
Selvaraj

Location:
Illapputhoppu, Tamil
Nadu, India

Occupation:
Panchayat President
(president of the
village assembly)

Risk exposure:
Heavy rainfall
(Monsoon season)



Selvaraj's story:

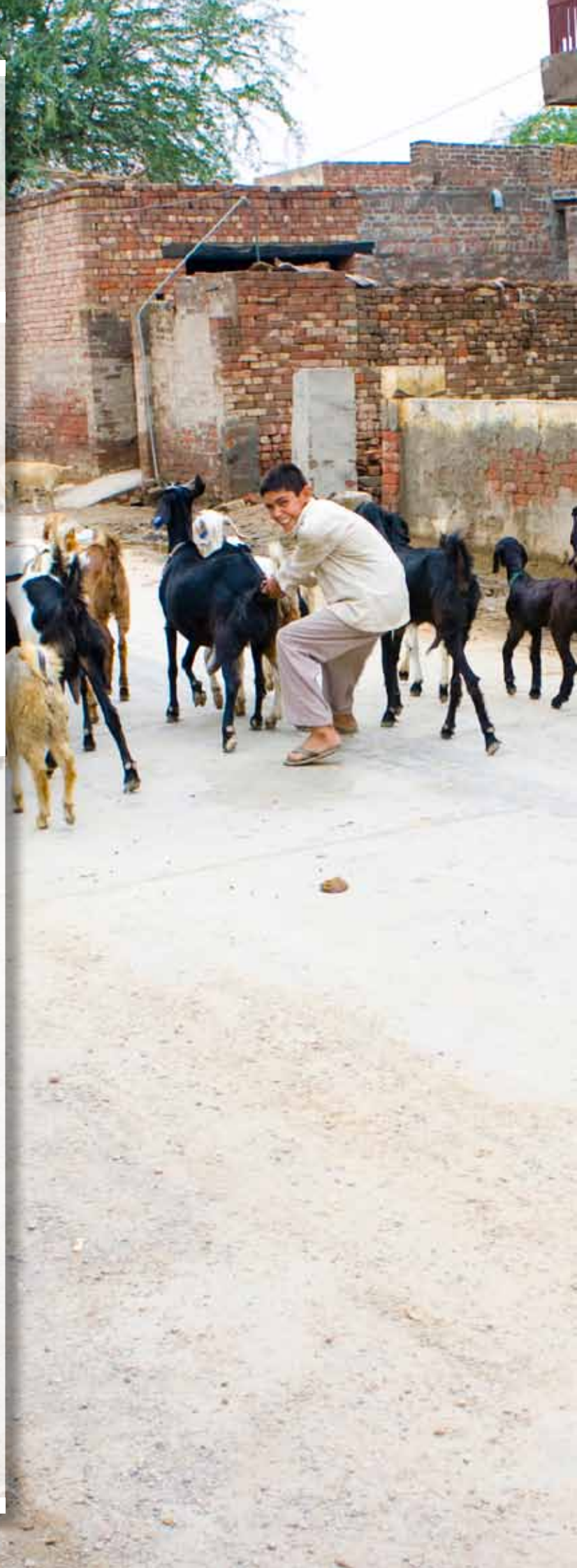
'In the past, people from my village used to think insurance is only for rich people, but since the microinsurance project was established, they are able to buy insurance plans themselves which are at an affordable cost. Self help groups now organize client education sessions which helped the people realize that how for several years we were managed by the risks and how we can better manage their bad outcomes, now, through insurance.'

The microinsurance scheme had the most striking impact on the Dalits (lowest caste, "untouchables"), who formerly never have had opportunities of choosing to manage their risk needs – now, the programme generated an opportunity of choices for them to lead a dignified life and thus achieve a greater level of financial security.

Generally, when a disaster hit, my community used to depend on disaster relief compensation provided by the government, but on this year's occasion, Illapputhoppu people demonstrated that through claims from insurance coverage, people can more easily return to normalcy. Otherwise these people would have borrowed loans from relatives, neighbors or, as often at very high interest rates from loan sharks .

Now I decided to work together with the NGOs to popularize insurance in other parts of my village Panchayat.'

Courtesy of CARE India and Bajaj Allianz (2009)





The MCII Climate Insurance Assistance Facility addresses the needs of Selvaraj and Lkhagva.

The Climate Insurance Assistance Facility helps develop pro-poor solutions in affected regions around the globe. It supports locally-tailored solutions, bottom-up approaches like microinsurance & social safety nets.

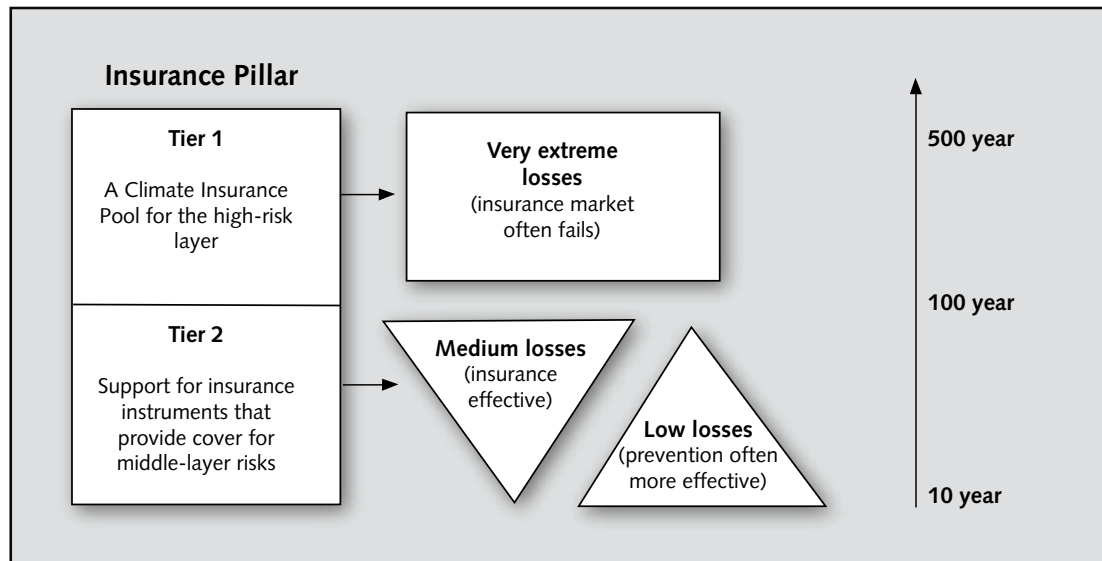


Fig.1: A two-tiered insurance pillar as part of a Climate Risk Management Mechanism

The importance of managing medium-level risks for the poor

In spite of best efforts to prevent and reduce risks which occur frequently, countries will face rising medium and high level climate-related risks. Such risks may exceed the ability of communities and countries to manage, and may require additional support and the option of sharing those risks. MCII proposes an *Insurance Pillar* with two tiers to deal with these. The figure above illustrates the two tiers of the proposed insurance pillar.

Climate Insurance Assistance Facility

Even with the best prevention and risk reduction activities, the increasing number and intensity of major weather catastrophes will affect countries. If governments are able to pay for the disaster damage, this may be the first and best line of defense for poor and vulnerable people living within those countries. Having strong social protection systems can enhance the ability of the public sector to manage climate risks such as larger than usual floods or droughts of longer periods that hit communities in particular regions, but may not constitute national emergencies.

At *medium levels of risk* – events such as a 1 in 50 year event – a Climate Insurance Assistance Facility will incentivize the *private sector* to engage in insurance and public-private solutions. Tier Climate Insurance Assistance Facility addresses middle-layer

risks to enable public/private insurance and other social protection systems for vulnerable communities.

Many examples of programs for these middle-layer risks exist: micro-insurance for agriculture (like today in Malawi), re-insurance for aid agencies (as in Ethiopia), and pooled solutions for countries in certain regions (like the Caribbean). Each of these initiatives was made possible with outside technical and financial support. The Climate Insurance Assistance Facility could directly *enable the poor to participate*, if deemed appropriate, through targeted support and minimally-distorting subsidies that would not crowd out private incentives for wider market segments. Regional centers can help build the market capacity for different kind of safety nets as well as for new markets for climate related insurance including micro-insurance.

Providing low-income households, farmers, and businesses with access to post-disaster liquidity helps secure their livelihoods. Insurance and social protection instruments can lessen the burdens from disasters and expedite the recovery process. For many, an insurance contract is more dignified and secure than dependency on the ad hoc generosity of donors. Since insured households and farms are more creditworthy, insurance can also promote investments in productive assets and higher-yield activities. Insurance instruments for communities, if designed carefully to avoid moral hazard, usually also provide incentives to reduce risk.



Profile

Name:
Tjimuhiva

Location:
*Omusati Region,
Opuwo, Namibia*

Occupation:
*Counsellor of
the Uukwaludhi
Traditional Authority*

Risk exposure:
Drought



Tjimuhiva's story:

'In 2007 we experienced a very severe drought. The pattern of rainfall is definitely changing. I remember many bad years but this is the first time over 3,600 cattle have been relocated from the Kuene region to my jurisdiction following this drought.'

The land of the community is totally overgrazed and even if it rains heavily today, we won't see any grass because the soil is totally degraded. Livestock have to travel long distances to grazing and water points, which contributes to their physical weakness.'

Since the drought has struck severely this time and people lost so many animals and crops, farmers from Kuene had to be resettled in 12 different villages in my region. If the government has the resources to help the people and the agricultural sector, we would be able to better cope with the consequences of the drought. If our government fails, we fail – but if they provide us with support and help restore our productivity after the drought, we could avoid a famine from happening.'

Source: <http://www.reliefweb.int/rw/RWB.NSF/db900SID/SIRU-7AY7WC?OpenDocument>





Profile

Name:
Alonso

Location:
Kingston, Jamaica

Occupation:
Public servant

Risk exposure:
Hurricane



Alonso's story:

"My country needs resources to finance disaster-related activities, and regional pooling provides a helpful, flexible, and timely manner of accessing these funds to meet immediate disaster response needs.

However, if my country does not plan disaster finance on its own, and if humanitarian aid is utilized as a matter of course to finance disaster needs, then projects such as building important infrastructure are never fully executed.

In the face of constant disaster shocks and our lack of financial preparation, these efforts could improve productivity, partly reduce poverty, enhance economic performance and could finally help us develop.'

Courtesy Koko Warner, MCII and UNU-EHS (2009)

The MCII Climate Insurance Pool (CIP) addresses the needs of Tjimuhiva's and Alonso's countries.

The CIP cannot insure all of the risks linked to climate change, but it can pay for a part of losses after major events and help the economy and people get back on their feet faster.

MCII's proposal helps governments address rare but devastating events

Today, in both developed and developing countries across the world, many households and businesses rely on their communities and the national government to help them after disasters occur. Public assistance plays a key role in helping households and municipalities deal with the negative impacts associated with natural hazards. Yet in many countries, particularly least developed countries, public assistance may be insufficient. For example, after the severe flooding in Sudan in 1998, the victims themselves absorbed over 80% of the losses .

Developing countries often face a development-disaster dilemma: to pay for disaster damage, governments often must divert funds from development priorities like education and health, or take loans from international financial institutions. The poor can suffer disproportionately when their governments cannot provide money to help them recover after a disaster.

The inaccessibility of sufficient and affordable capital to support the recovery process in highly vulnerable countries is the main rationale for donor organizations, and also for a climate adaptation regime, to provide assistance to insurance programs. Switching from post-disaster humanitarian assistance to providing pre-disaster security through insurance instruments also has benefits to donors. Because insurance instruments can be linked to ongoing efforts to risk reduction (i.e. as a participation criteria), ex ante support of insurance reduces the need for unforeseen emergency assistance.

To address these, MCII proposes that a Climate Insurance Pool will absorb a pre-defined proportion of high-level risks of disaster losses, particularly in vulnerable countries, at no cost to the beneficiary countries. The Climate Insurance Pool will be reinsured against extreme loss years in the global reinsurance market. The Climate Insurance Pool could operate outside of the UNFCCC as an entity at an already-established institution or independently (as parties designate), but with accountability to the Conference of the Parties.

For governments, insurance instruments can also have large payoffs by reducing the risk of a post-disaster financial gap and thus ensuring the timely repair of public infrastructure and provision of relief expenditures. Just like investments in prevention and risk reduction, timely relief and reconstruction can save lives and livelihoods and help prevent disaster-induced poverty traps. With internationally backed risk-pooling programs, developing country

governments will rely less on debt financing and international donations, and be in a better position to pursue development goals that enhance resilience and adaptation for their countries.

Will donors always help pay after the disaster?

With the exception of highly publicized disasters, donor assistance is usually inadequate to meet post-disaster needs.

On average, international post-disaster assistance has approximated 10% of direct economic losses, and it can be much less.

For example, support for victims of the devastating floods affecting Bangladesh in 1998 was estimated at about USD 3 per affected victim.

Nor can governments rely on post-disaster assistance.

As a typical case, two years following the 2001 earthquake in Gujarat, India, assistance from international sources had reached only 20% of original commitments.

The MCII Proposal

- *Prioritizes vulnerable countries & people*
- *Puts risk reduction in vulnerable countries first*
- *Offers incentives for countries & communities to achieve their risk reduction goals. As countries demonstrate ongoing commitment & progress in achieving their goals, they can qualify for insurance coverage at local & national levels with international support.*
- *Addresses low, medium, and high level risks from climate-related natural hazards for vulnerable countries & vulnerable people.*
- *Effective adaptation starts locally. Tailored micro-insurance solutions can help to transfer some risks that hinder development.*
- *Yet MCII's approach realizes that community (micro)-level approaches will be overwhelmed without sufficient back-up for countries if large disasters hit.*
- *Thus MCII's proposal addresses both the needs of vulnerable countries & people through disaster risk reduction, a Climate Insurance Assistance Facility, and a Climate Insurance Pool.*

Conclusions

As the frequency and intensity of extreme weather events mount, the urgency of building on successful risk reduction initiatives is increasing as well. Today the need is greater than ever to reduce and transfer risk in ways conducive to climate change adaptation and sustainable development. The previous sections indicate that insurance can be a useful component of such a comprehensive strategy in developing countries.

MCII's proposed structure includes a Disaster Risk Reduction pillar to help households and communities break the disaster-development cycle. The Risk Reduction pillar helps bridge the gap between national planning for risk reduction, and implementing these plans in ways that help poor communities increase their resilience to frequent risks associated with climate change impacts. Disaster risk reduction and insurance must be designed to work hand-in-hand to facilitate adaptation - at the community level, at the national level, and also regionally as countries work together to reduce and share the burden of climate-related risks and extreme events.

MCII's Insurance pillar helps communities and governments by ensuring rapid insurance payouts to speed recovery. Instead of hoping for international support for major catastrophic events, or scraping together limited public funding for medium-level events, the presence of an insurance back-up would ensure that governments have help in paying for disaster damage. This would help both governments and communities recover more quickly and possibly effectively after a disaster occurs.

Insurance cannot be treated as a sustainable or cost-effective solution for managing all the risks in all contexts associated with climate change. Large-scale phenomena as melting glaciers or sea level rise can hardly be addressed, but as part of a wider adaptation strategy, insurance can play a role in addressing some of the risks associated with climate-related extreme events and disasters.

The drive towards a new climate change agreement in Copenhagen in December 2009 represents a historical chance to establish a comprehensive risk management framework that prioritizes disaster risk reduction and uses insurance solutions as one tool to help achieve adaptation in vulnerable countries and people.

"In many Pacific Islands, rural communities face a real crisis of defenselessness and insecurity because of climate change. They lack information and have no weather-risk insurance to encourage and support their small businesses, protect their property, and livelihoods. This leaves them in dire need of help.

This situation continues to remind us that should local governments and all relevant stakeholders fail to address their leading roles effectively to become an enabling resilient nation from weather-related disasters, the majority of the population will suffer and could fall into the poverty trap.

Having said that, the risks of climate change also present us with an opportunity - if we can manage the uncertainties that come along with it. What we need now are forward thinking solutions that urge risk reduction, team work, government and all stakeholders to help build capacity and restore confidence in our communities. This kind of support would be of great help to countries like mine - it would bolster our strength to survive as a nation during climatic natural disasters."

PNT Tugaga, Samoan insurance expert, September 2009

Further Reading

- Alliance of Small Island States (AOSIS) (2008): *Multi-Window Mechanism to Address Loss and Damage from Climate Change Impacts*. Proposal to the ad hoc working group on long-term cooperative action under the convention (AWG-LCA). <http://unfccc.int/files/kyoto_protocol/application/pdf/aosisinsurance061208.pdf>, 14 April 2009.
- Ammann, W. et al. (2004): *Evaluation of Inter-American Development Banks Operational Policy on Natural and Unexpected Disasters (OP-704) and Action Plan*. Report for the Executive Council. IDB. Washington DC.
- Bals, C.; Warner, K.; Butzengeiger, S. (2007): Insuring the uninsurable: design options for a climate change funding mechanism. In: *Climate Policy*. Special Issue on Insurance and Climate Change.
- Barnett, B.J.; Barrett, C.B.; Skees, J.R. (2008): Poverty traps and index-based risk transfer products. In: *World Development*. vol. 36, pp.1766-1785.
- Bouwer, L.; Warner, K.; Hoff, H. (2005): Risk management and climate change adaptation: can financial services help? In: *Climatic Change*. Special Issue on Dialogue on Water and Climate.
- Gurenko, E. (2004): *Catastrophe Risk and Reinsurance: A Country Risk Management Perspective*. Risk Books, London.
- Harmeling, S.; Bals, C. (2008): *Adaptation to Climate Change - Where do we Go from Bali?* An analysis of the COP 13 and the key issues on the road to a new climate change treaty. Germanwatch Briefing Paper. March 2008.
- Hoff, H.; Warner, K.; Bouwer, L. (2005): The role of financial services in climate adaptation in developing countries. Special issue on the economic costs of climate change. In: *Vierteljahrshefte zur Wirtschaftsforschung*. vol. 74, no. 2, pp. 196-207.
- Hoeppe, P.; Gurenko, E. (2006): Scientific and economic rationales for innovative climate insurance solutions. In: *Climate Policy*. Special Issue on Insurance and Climate Change.
- Intergovernmental Panel on Climate Change (IPCC) (2007): *Climate Change Impacts, Adaptation and Vulnerability*. Summary for Policymakers. Cambridge University Press, Cambridge.
- Linnerooth-Bayer, J.; Mechler, R.; Pflug, G. (2005): Refocusing disaster aid. In: *Science*. vol. 309, pp. 1044-1046.
- Linnerooth-Bayer, J. et al. (2009): *Insurance, Developing Countries, and Climate Change*. Special issue on Climate Change and its Economic Impact on Insurance. The Geneva Papers on Risk and Insurance - Issues and Practice.
- Mileti, D. S. (Ed.) (1999): *Disasters by Design: A Reassessment of Natural Hazards in the United States*. Joseph Henry Press, Washington DC.
- Munich Climate Insurance Initiative (MCII) (2008): *International Insurance Mechanism: A Proposal for the Copenhagen Agreed Outcome*. Proposal to the ad hoc working group on long-term cooperative action under the convention (AWG-LCA). <<http://unfccc.int/resource/docs/2008/smsn/ngo/033.pdf>>, 14 April 2009.
- Munich Reinsurance Company (2007): *Topics: Natural Disasters. Annual Review of Natural Disasters 2006*. Munich, Munich Reinsurance Group.
- Skees, J. R.; Barnett, B. J.; Murphy, A. G. (2008): Creating insurance markets for natural disaster risk in lower income countries: the potential role for securitization. In: *Agricultural Finance Review*. vol. 68, pp. 151-157.
- Solomon, S. et al. (2007): Technical summary. In: Solomon, S. et al. (Eds.): *Climate Change 2007: The Physical Science Basis*. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge University Press, Cambridge.
- Stern et al. (2007): *Stern Review Report on the Economics of Climate Change*. Cambridge University Press, Cambridge.
- UNFCCC (2007): *Bali Action Plan*. <http://unfccc.int/meetings/cop_13/items/4049.php>, 14 April 2009.
- UNFCCC (2008): *Report on the Workshop on Risk Management and Risk Reduction Strategies, Including Risk Sharing and Transfer Mechanisms such as Insurance*. Summary by the chair of the workshop. <<http://unfccc.int/resource/docs/2008/awglca4/eng/crp07.pdf>>, 14 April 2009.
- United Nations (1992): *United Nations Framework Convention on Climate Change*.

Warner, K.; Spiegel, A. (2009): Climate change and emerging markets: the role of the insurance industry in climate risk management. In: The Geneva Association: *The Geneva Reports. Risk and Insurance Research. The Insurance Industry and Climate Change - Contribution to the Global Debate*. <http://www.genevaassociation.org/PDF/Geneva_Reports/Geneva_report%5B2%5D.pdf>, 14 April 2009.

Warner, K. et al. (2009): *Adaptation to Climate Change: Linking Disaster Risk Reduction and Insurance*. A policy paper prepared for the 2009 Climate Negotiations.

Picture Credits:

Care India and Bajaj Allianz: 12 (Portrait)
Istockphoto: 6, 12-13, 16-17
Oft, Philine: 8 (Portrait)
Shutterstock: 6-7, 8, 11
Skees, Jerry: 11 (Portrait)



UNITED NATIONS
UNIVERSITY

UNU-EHS

Institute for Environment
and Human Security

Established by the U.N. General Assembly in 1973, the United Nations University (UNU) is an international community of scholars engaged in research, advanced training, and dissemination of knowledge related to pressing global problems. The United Nations University created the Institute for Environment and Human Security (UNU-EHS) to address risks and vulnerabilities that are the consequence of complex - both acute and latent - environmental hazards. It aims to improve the in-depth understanding of the cause-effect relationships to find possible ways to reduce risks and vulnerabilities. The institute is conceived to support policy and decision makers with authoritative research and information. UNU-EHS is supported by the German Federal Ministry of Education and Research and the Ministry of Innovation, Science, Research and Technology, State of North Rhine-Westphalia, both dedicated to promoting sustainable development and advancing human security. UNU-EHS aims for academic excellence in principal priorities of its programme:

- Vulnerability assessment, resilience analysis, risk management and adaptation strategies within linked human-environment systems; and
- Internal displacement and trans-boundary migration due to environmental push-factors;

whereby the major drivers such as land degradation, desertification, natural hazard events, gradual human-induced and natural environmental and climatic change and variability, including water depletion and quality deterioration are considered. Preparedness, adaptation, and response are the main dimensions along which human security can be strengthened. A special work focus of UNU-EHS is to conduct research on water related hazards along big rivers and on deltas. In addition, on behalf of the United Nations University, UNU-EHS is actively engaged in the activities of the International Flood Initiative (IFI) which focuses on research, information networking, education and training, empowering communities, and providing technical assistance and guidance.

Designed by Andrea Wendeler
Copy-Editors: Ilona Roberts, Deborah Odumuyiwa,
Katharina Brach
Printed at Druckerei Gerhards, Bonn, Germany
1 edition, 2000 copies, October 2009

The views expressed in this publication are those of the author(s).
Publication does not imply endorsement by the UNU-EHS or the
United Nations University of any of the views expressed.

ISBN: 978-3-939923-30-5 (printed version)
ISBN: 978-3-939923-31-2 (electronic version)

UNITED NATIONS UNIVERSITY
UNU in Bonn
UN Campus
Hermann-Ehlers-Str. 10
D – 53113 Bonn, Germany
Tel: +49 (0) 228 815-0200
Fax: +49 (0) 228 815-0299

publications@ehs.unu.edu
www.ehs.unu.edu