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The Role of Financial Services in Climate Adaptation in Developing Countries

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Summary: Finance and insurance industry ("financial services") can play a key role in climate adaptation, by reducing and transferring risks. However, financial services are largely absent from developing countries with their highly vulnerable economies and livelihoods. The financial services sector claims in particular a lack of business opportunities for that. We provide examples of innovative financial tools such as micro-credits, index-based insurance, government supported insurance pools, international re-insurance and adaptation and new partnerships between private sector, governments, civil society and international organisations, that support pro-active adaptation to climate change and disaster reduction, and thus reduce the costs of climate change. In some cases these tools have been introduced successfully in developing countries. Through partnerships with the financial services sector, currently fragmented adaptation activities can be integrated and mainstreamed with development goals and natural resource management. Science can support these partnerships e.g. with climate scenarios and assessments of future risks and hotspots for intervention.

Zusammenfassung: Der Finanz- und Versicherungssektor (im folgenden Finanzsektor genannt) kann Klimarisiken mindern und damit eine zentrale Rolle bei der Anpassung an den Klimawandel spielen. Allerdings ist der Finanzsektor gerade in den Entwicklungsländern mit besonders hohen Klimarisiken und hoher Klimavulnerabilität kaum präsent, wofür insbesondere das Fehlen von Geschäftsmöglichkeiten verantwortlich gemacht wird. Wir stellen eine Reihe von innovativen Finanzsektorwerkzeugen wie Mikrokredite, indexbasierte Versicherungen, Versicherungspools und internationale Rückversicherungen und Anpassungsfonds sowie neue Partnerschaften zwischen Privatsektor, Regierungen, Zivilgesellschaft und internationalen Organisationen vor, die pro-aktiv die Anpassung an den Klimawandel und gleichzeitig den Katastrophenschutz unterstützen und damit die Kosten des Klimawandels vermindern können. In einzelnen Fällen sind solche Werkzeuge bereits erfolgreich in Entwicklungsländern eingeführt worden. Durch geeignete Partnerschaften mit dem Finanzsektor können bislang noch fragmentierte Anpassungsaktivitäten zusammengeführt werden. Dabei ist Klimaanpassung mit Entwicklungszielen, Katastrophenschutz und natürlichem Ressourcenmanagement zu integrieren. Die Wissenschaft kann solche Partnerschaften z.B. durch Klimaszenarien sowie Abschätzungen von zukünftigen Klimarisiken und kritischen Hotspots unterstützen.

1 Background

Developing countries are particularly vulnerable to the effects of climate variability and climate change (Smith et al. 2003). These countries are often located in regions with high natural climate variability and are *highly exposed* to climate extremes such as droughts or floods (DWC 2003). Such extreme weather events dampen economic and social develop-

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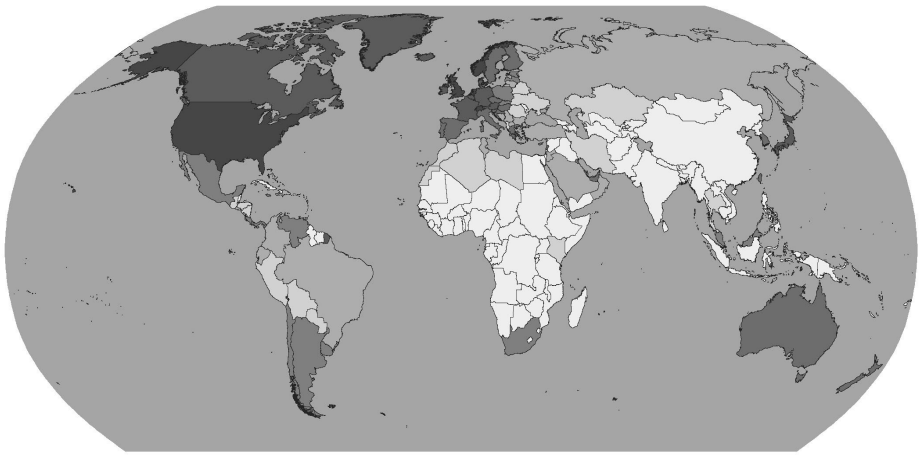
ment, and cause high numbers of casualties, much higher than in industrialized countries. Economic losses from these disasters have also been increasing rapidly over the past decades. In some cases, disasters set back development by several years or percentage points of GDP (Grey 2004). Between the 1950's and the 1990's, the annual direct losses from natural catastrophes have increased from $3.9 billion to $40 billion a year (IPCC 2001). If climate changes as estimated by the Intergovernmental Panel on Climate Change (IPCC), the direct losses from extreme weather events could rise as high as $100 billion annually, according to some estimates (Munich Re 1999). However, these increases may not only be a function of changes in climate, but could largely also be due to higher vulnerability (e.g. Changnon 2003).

Developing countries have relatively *low adaptive capacity.* The direct losses from weather-related disasters significantly impact the poor. For example, in many developing countries large percentages of the population depend on agriculture for their livelihoods, which is frequently fatally interrupted by disasters like drought. All major studies that examine the impact of natural disasters on economic development, describe the heavy burden placed on the poor (e.g. AfDB et al. 2003). In fact, in some of the most hazard prone regions of the world, the increased losses from natural disasters could negate the capacity of economic development to reduce the number of people living in poverty.

Figure 1

The World of the Insured and Uninsured



Property insurance premium (non-life including health) per capita per year in US $.

Source: Munich Re, Topics Geo: Jahresüberblick Naturkatastrophen 2003, München 2004.

Traditionally, the *management of climate extremes* has focused on structural and ex-post measures and a large proportion of all disaster-related spending is still ex-post. Pro-active adaptation is not yet sufficiently addressed by developing country governments or donors (e.g. Van Aalst and Helmer 2004, Bouwer et al. 2004).

A central challenge developing countries face in adapting to climate variability and climate change is the ability to finance measures to deal with sudden- and slow-onset weather-related events. The poor often have little access to formal financial services, while informal services such as money lending can charge interest rates commonly ranging from 30 to 120 percent (Hess 2003), discouraging investment in adaptive capacity, and leading to greater debt burdens for poor households, or both. Further, figure one illustrates that insurance penetration in developing countries is very low compared with industrialized countries.

Although additional funds have been created under the United Nations Framework Convention on Climate Change (UNFCCC) to facilitate both capacity building and implementation of adaptation, these funds are very limited in size and overlap with many other sources that could be used for adaptation (Bouwer et al. 2004). Also, some countries interpret their support of these adaptation funds as a general contribution to the Global Environment Facility (GEF) and as Official Development Assistance (ODA). Therefore, alternatives have to be explored.

2 The Role of Financial Services in Reducing the Costs of Climate Change in Developing Countries

To minimize the effects of climate variability and climate change in developing countries, there is a need to implement appropriate tools for *pro-active climate adaptation* and risk transfer, such as insurance and risk finance through banking services (Bouwer and Vellinga 2002, Hoff et al. 2003, Mills 2004).

When building portfolios of adaptive measures in developing countries, financial services can and should play a strong role. A reduction, sharing or spreading of climate-related costs and risks can be facilitated by tools such as:

- (index-based) micro-insurance/micro-credit schemes, enabling the poor to diversify risk and lower vulnerability,
- (government supported) risk/insurance pools,
- access to international re-insurance and financial markets,
- catastrophe bonds, weather derivatives and other financial market tools.

The financial service sector overall has long-standing experience in risk management. This experience can be tapped for climate adaptation and disaster risk management, by building new partnerships with governments, civil society, international organizations etc. Adapting available risk management practices from the financial services sector for current and future climate risks means that disaster management can be mainstreamed into

development and poverty reduction. At the same time these new partnerships may yield benefits for the financial services sector as well, e.g. providing access to new markets or opportunities for corporate social responsibility and eventually reducing the sector's own vulnerability to climate risks.

As part of pro-active climate adaptation and disaster risk management, financial services complement other adaptive and preventive measures and early warning systems, and can in fact make these measures more effective. New financial alternatives that complement conventional structural measures may encourage risk reduction activities such as withdrawal from highly exposed areas or proper infrastructure maintenance (Warner 2004).

Developing countries need climate adaptation financing that is affordable, equitable and which provides incentives for pre-emptive vulnerability reduction. Financial services provided in partnerships that involve the public and private sectors have to be integrated in comprehensive climate adaptation and disaster management to help prevent further human suffering. Finance arrangements put into place before a disaster – including household or government reserves, commercial and non-commercial insurance, contingent credit and catastrophe bonds – are critical for ensuring effective, sufficient capital for relief and recovery in highly exposed developing countries. Important precedents in middle-low and low-income countries exist: micro-insurance and micro-finance schemes for the poor, the Turkish Catastrophe Insurance Pool, a catastrophe bond in Taiwan, and others.

3 The Role of Financial Services in Climate Adaptation – Examples from around the World

Engagement of financial services in climate adaptation has to be embedded in longer term development strategies in response to the combined effects of climate change and globalization. A three pronged approach to this end consists of:

adaptation to current and foreseeable climate pressures, e.g. through weather derivatives and catastrophe bonds,

support for livelihood adjustments for unexpected changes, e.g. through social protection funds, micro-credit and insurance enabling the poor to diversify climate risks,

investment in societies to enhance resilience and at the same time foster development and achievement of the Millenium Development Goals.

Adaptation to current climate variability and extreme events can serve as a basis for reducing vulnerability to climate change, as stated in the Adaptation Policy Framework (Lim et al. 2004). Therefore, if the management of current and future climate risks (climate variability, weather extremes) becomes a priority for public and private sector, disaster risk finance can be an important option to effectuate both risk reduction as well as absorption of residual risks. Many examples exist, how disaster risk financing can serve climate adaptation purposes:

3.1 (Index-based) Micro-Insurance/Micro-Credit Schemes, Enabling the Poor to Diversify and Take More Risks

Agricultural and index-based insurance schemes can protect rural population from the effects of climate extremes. In Vietnam, a partnership between the national government, the United Nations Development Program and the Asian Development Bank created a scheme that consists of two parts: a national disaster relief fund and a government insurance that in future will be backed by reinsurance. The annual premiums of currently US$ 1 per capita can also be linked with incentives for risk reduction, such as improved housing construction or moving out of high-risk areas (Provention 2004a).

Index-based insurance schemes are also beginning to be used in emerging markets, such as Mexico or South Africa. World Bank and its partners in India (e.g. Mahindra Shubhlabh investee company and Indian Grameen Services) have developed an index-based monsoon insurance scheme for crop loans, which insures farmers against drought risk. This product is embedded in a loan agreement and then combined with a savings account. Its contracts are written against specific rainfall outcomes recorded at a local weather station. Weights are assigned to different rainfall periods in order to maximize the correlation between yields and rainfall. An insured event might be for example that rainfall during the most critical month of the growing season is 70 percent below normal. Payouts are proportional to the measured rainfall deficit below the threshold. The Mahindra Shubhlabh company plans to develop 180 Agricultural Service Centers in India's major agro-climatic areas, located in rural areas in small towns and villages (Hess 2003).

In Ethiopia, World Bank and the World Food Program have developed a pilot scheme to use a weather-indexed insurance scheme for reducing drought risks. The index is based on precipitation and temperature measurements and levels of payment are based on the drought severity. Premiums are paid by donors, for whom this scheme provides a smoothing of expenditures. This relief scheme is triggered before the drought causes an acute hunger emergency, thus providing early or proactive intervention. Also, drought risks can be transferred to the capital market, e.g. through catastrophe bonds (Provention 2004a). Other climate index-based insurance schemes have been developed in Uruguay for flooding and for Peruvian fisheries facing El Nino impacts (Provention 2004a).

NGO initiated schemes have been implemented to reduce climate risk and contribute to poverty reduction. For example, the Disaster Mitigation Institute (DMI) in India has developed an insurance scheme "Afat Vimo" that currently covers about 6000 households in Gujarat. For a one-time premium of US$ 1.50, clients can purchase US$ 1,600 worth of disaster insurance. In addition, DMI offers, through the formation of local business chambers, risk reduction training (Afat Vimo 2004).

3.2 (Government Supported) Risk/Insurance Pools and Mutuals

Catastrophe pools address climate risks, such as those faced by the small islands developing states. The Commonwealth Disaster Management Agency (CDMA) for example has developed a catastrophe pool for these states to insure their international debt service obligations during disasters, spreading the risk among the states and transferring parts of it

to the international capital market. Lloyds underwrites this catastrophe pool (Provention 2004a).

Similar catastrophe pools, such as the Turkish catastrophe insurance pool for flood risks are providing additional incentives for enhancing building standards, thereby reducing climate risks (von Lucius 2004).

Mutuals are member-owned enterprises that provide financial services like loans to the poor. The Development of Humane Action (DHAN) foundation in India promotes self-help groups and other types of community organizations for sharing risks. The DHAN community banking program organizes poor women into self-help groups called Kalanjiams, which enables members to access life, health, livestock and other asset insurance. So far, the involved companies do not have reinsurance, but there is a need for layered financial services to spread climate risk and overcome covariate risk (Provention 2004a).

3.3 Access to International Financial Markets to Encourage Appropriate Investment

Responsibility Social Investment Services Ltd is a social investment platform, sponsored by four Swiss banks and complemented by a private social investment fund. It provides loans to micro-finance institutions in low-income areas, where not enough funds can be generated from local banks and investors. This kind of access to financial services is critical for micro-finance institutions to withstand climate-related risks and enlarge their markets (Provention 2004a).

FINCA, the Foundation for International Community Assistance, offers micro-loans through its village banking system. The FINCA loan and insurance products are backed by a partnership with the international insurer AIG. FINCA provides services to its international partner, such as client screening and publishing insurance claims, and hence it helps the international insurer to gain access to the local market at reduced administrative cost (Provention 2004a).

Interpolis, a subsidiary of the Rabobank Group, is a reinsurance company involved in a number of micro-insurance schemes in developing countries. Driven by corporate social responsibility, Interpolis is providing financial and technical assistance and reinsurance to micro-finance institutions, e.g. in Sri Lanka and India. In India, Interpolis has developed, together with the DHAN foundation, group policies to provide insurance against climate risks. Also through the DHAN foundation, education about micro-insurance is provided to the local population (see *www.dhan.org*).

The *Inter-American Development Bank* assists governments to address underlying constraints that hinder the private sector from engaging in risk financing through (Warner 2005):

- helping to remove market barriers to entry,
- strengthening property valuation and titling,

- improving the application of building codes, and
- assisting in risk assessments, including support for land use planning.

3.4 Catastrophe Bonds, Weather Derivatives and other Financial Market Tools

These tools that could tap the large additional potential of the international financial markets are largely limited to developed countries, so they don't yet support climate adaptation in developing countries.

4 Experience from Financial Services Engagement in Climate Adaptation

Financial services can contribute significantly to reduce costs of and adapt to climate change in developing countries. However, existing schemes reveal the need to address several major issues, before a sustainable and substantial contribution can be expected.

Need for a systematic assessment of experiences from pilot projects: while individual schemes to support the financing of disaster risk reduction and to a lesser degree climate change adaptation have been applied in different regions, these activities are rarely coordinated between organizations to capture lessons learned. Sometimes these activities are in partnership with insurance companies and banks, but there is no systematic cooperation between civil society, private sector, public sector and international donors. Also existing efforts are not well-known by the public or private sector. Efforts are sometimes duplicated and lessons learned are not widely disseminated. To avoid an ad hoc application of financial tools and to improve the chances that financial services will be used effectively, activities need to be systematically assessed for their success and transferability to other regions. Eventually financial services need to be mainstreamed into development and climate adaptation frameworks. To achieve such mainstreaming there is a need for a platform for partnerships and sustained dialogue, common vocabulary, time frames and objectives. For example, the private sector generally pursues profitability while NGOs and governments seek broader societal objectives and the international community focuses on areas specific to the development process, such as poverty reduction.

Need for appropriate incentives to proactively address climate change and disaster risk: the current system of managing catastrophic events discourages proactive risk management. Areas affected by natural hazards and manifestations of climate change receive the signal that national governments and the international community will provide large sums of financial assistance for emergency relief and humanitarian assistance following catastrophes. It makes little sense to lay aside scarce resources to prepare for adaptation if countries can expect aid during crises. International development projects are generally uninsured against climate risks, and a major part of official development aid (ODA) has to be invested in reconstruction and rehabilitation from climate extremes (World Bank 1999). The World Bank estimates that 69 % of their disaster related projects devote resources to reconstruction and rehabilitation, rather than pro-active risk reduction or adaptation to extreme events (Lester 1999). Similarly some larger wealthy countries self-insure rather than paying premiums or interest rates, a response that might make sense if the effects of a catastrophe can be absorbed at no cost (Arrow and Lind, 1970). However, de-

veloping countries are likely not in such a position. Further, levels of emergency assistance depend on worldwide media awareness of an event as well as timing of events: if a catastrophe is not widely covered by the press or if an event follows a string of other disasters, donors may not give sufficient resources to help the affected area recover. Clearly incentives are needed to encourage proactive measures to adapt to climate change and lower current risk.

Need to engage the private sector with its expertise: a significant challenge in the use of financial services for disaster risk reduction and adaptation to climate change is the low level of engagement of private sector companies. Developing countries often need increased expertise in financial services industry, such as a labour force with skills in accounting and administration, product design and pricing. Further, private companies face several challenges that must be addressed for wider involvement. International financial markets have been performance stressed for several years. Few businesses are prepared to take an active lead in providing their services for disaster risk reduction or climate change adaptation. While private companies may be interested in developing new markets and products, many of the requirements for business development are not yet adequately addressed in developing countries: Formal insurance and banking companies, for example, are accustomed to working in well organized institutional environments with access to literate clients. These clients can provide data and verifiable documentation for underwriting and claims (such as certificates of health or death, receipts or titles stating values of assets). In contrast, low literacy rates in some developing countries especially among the poor is a challenge for financial services provision. Better information about product design and implementation, market conditions, and client demand is required. There is a debate whether financial services should be linked directly to social protection, or complement social objectives through market products. Social protection projects often receive subsidies and are motivated by humanitarian ideals that do not necessarily consider economic efficiency. Approaching financial services for adaptation as a social protection program can relax market discipline. Without market discipline providers can overlook risk management guidelines and client demands, thus resulting in unsustainable business practices. Corporate social responsibility has motivated a few firms to form partnerships with local providers (Interpolis), but ultimately for private sector involvement there needs to be a sustainable demand for viable products at a market-driven price.

Need for sufficient regulatory frameworks: additional barriers such as insufficient legal and regulatory frameworks make it difficult for the financial sector to penetrate developing markets. Regulations for financial services, particularly those for the poor, are insufficient in many developing countries. Regulators tend to focus attention on conventional financial service institutions, which can lead them to set capital requirements too high and place inflexible rules on agents – limiting the access to financial services. Current regulatory structures in some developing countries may prevent community initiatives or NGOs from cooperating with financial service companies. As a result, many developing countries have little formal risk transfer services such as insurance (e. g. Munich Re 2004). That reduces further the adaptive capacity of the most vulnerable, poverty-stricken communities to climate variability and climate change. Examples of areas that require more work are regulations that would allow financial services to better manage all sorts of risks, and improving science (such as flood maps). There is also a need for communications and other technological infrastructure to facilitate provision of financial services.

Possible Solutions: Effective partnerships present a plausible way to address some of these issues and bring the benefits of financial services to underserved areas. Many possible combinations of partnerships exist, from coordination between the public and private sectors to collaboration at all levels from local to global. Working across sectors and levels can facilitate the successful use of financial tools in developing countries. What is necessary for partnerships are ongoing dialogue, and realistic arrangements which take advantage of the comparative strengths that each partner brings to cooperative arrangements (Warner and Dannenmann, 2004). For example:

- *International organizations* can offer stability and a forum for dialogue and have the technical and operational expertise needed to support pilot projects and disseminate lessons learned. International organizations can also push to mainstream the use of financial services in activities aimed at climate change adaptation to climate change.

- *Development banks* can initiate and initially co-fund finance schemes. As these schemes become economically self-sustaining, banks could make way for private companies. Development banks can also address their own operational policies to ensure that appropriate incentives are in place for client countries to pursue active climate change adaptation, instead of only waiting for emergency relief in times of distress.

- *Governments* can create the legal and institutional framework for financial and insurance services, and can also foster a proactive approach to managing the risks associated with changing climatic conditions.

- *Community groups* can organize in ways that allows financial service provision – by pooling collateral, reducing moral hazard and adverse selection through self-monitoring, by handling claims and administration, and by promoting the use of financial services among local members. By sharing the cost of losses suffered by individual members, community groups can encourage adaptation and risk reduction activities by all group members.

- The *private sector* can provide the core expertise and tools needed for disaster financing and risk transfer in developing countries – i.e. support capacity building. Investment in developing countries may provide options for corporate social responsibility initiatives that in the longer term should facilitate market and product development.

- *NGOs* can bring innovation and local knowledge and often have the trust and working relationships with community groups.

Further, science can help to build capacity in climate risk management by providing much needed data and information to support financial services in developing countries. The design of insurance and disaster financing schemes requires background information about the hazard or exposure to climate risks, and the number of people, properties and economic values exposed. Science can also provide future scenarios of climate, population and economic development and vulnerabilities to extreme events.

Many enabling steps can be taken today that will lay the basis for both a healthier, more flexible financial services industry in the future as well as specific products for climate

adaptation in developing countries. To engage in such countries, a new, positively slanted approach would be helpful. In the intenrational climate negotiations sphere, advocating options like climate insurance could be a way to encourage wealthy countries to support risk pools in exchange for a shift away from liability/responsibility debates. Such an approach would offer wealthy countries a chance to participate by reducing the negative blame seeking that dominates discussion now. Financial services could also offer developing countries a chance to engage in more risk reduction and adaptation activities. Alternatively, developing solutions for problems in well-established markets like Europe or the U.S. might be a realistic precursor to more ambitious proposals. Creating viable products for climate adaptation first in well-established markets could both persuade private companies to participate and pave the way for appropriate products for developing country markets.

5 Conclusions

A number of financial tools have been developed that address climate adaptation/risk reduction. Although many examples of successful pilot projects using such tools are now reported in developing countries, the application of financial services remains fragmented. There are currently major obstacles for comprehensive implementation of these tools in developing countries, in particular because of the perceived lack of business opportunities or the lack of reinsurance or other financial capacity. Enough has been learned, however, to lay out a basic roadmap of the way ahead. Now several concrete steps must be taken to explore the use of financial services for climate change adaptation in developing countries.

Concrete next steps could include a variety of activities, ideally coordinated through a channel that would allow dissemination of good practices and lessons learned. Such steps could include the following:

- *Case studies and data*: A lot of progress could be made by compiling case studies from around the world and the experiences gained, how financial services can be used in specific contexts to facilitate adaptation. A comprehensive compilation of case studies and pilot projects could serve to foster dialogue with potential clients in developing countries including the poor, and to build business cases for long term investments and financial services. Eventually, this would allow to study the actual impacts of financial services, in partnership with disaster management and climate adaptation facilities. This way also a a common understanding of data needs could be developed, and mutual data collection activities could be implemented.

- *Raising awareness*: Besides the compilation of projects and experiences, there is a major need for raising awareness of the potential role financial services can play in climate adaptation. This can be achieved on one hand by identifying and supporting champions of financial services in government and civil society and on the other hand by providing training, capacity development and institutional development.

- *Working groups*: A number of working groups have begun to explore the provision of financial services in developing countries. They have developed initial models of partnerships and stakeholder involvement, which would enable communities to identify

adaptation activities and ways they can use financial services to undertake those activities, by realigning incentives to promote adaptation and appropriate use of ex ante financial services (including planning ahead, etc.).

Partnerships of different types and levels of actors – with the involvement of international organizations, private companies, and research institutions are the preferred way to take these concrete steps to make possible the use of financial services for climate adaptation activities. Working groups and initiatives, such as the UNEP Finance Initiative, the Disaster Risk Finance interest group formed after the World Conference on Disaster Risk Reduction, and the Munich Reinsurance Company Trust Fund "from knowledge to practice", all provide points of departure for more investigation and coordinated pilot studies on the use of financial tools for climate adaptation.

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