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Applicability of Risk Transfer Tools to Manage Loss and Damage from Slow-onset Climatic Risks

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Abstract

This paper aims to provide inspiration for how risk transfer tools such as insurance can facilitate approaches to address loss and damage associated with the impacts of climate change including slow-onset events. In particular it aims to show how insurance can be used in conjunction with a wide set of climate risk management tools to bolster societal resilience. The paper offers an overview of slow-onset climatic processes, provides a description on the current innovative tools and approaches to help reduce loss and damage associated with slow onset events provides case studies, and discussed some of the gaps and challenges related to implementation and enabling environment needed to manage climate risks in developing countries.

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1. Introduction

In 1992, Article 4.8 and 4.9 of the United Nations Framework Convention on Climate Change (UNFCCC), called upon the Parties to consider transfer of insurance-like approaches (risk transfer tools) to meet the specific needs and

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concern of developing countries, arising from the adverse effect of climate change. In 1997, Article 3.14 of the Kyoto Protocol called explicitly to consider insurance to manage loss and damage from changing climate (Linnerooth-Bayer and Mechler, 2006). The recent rise in losses and damage from extreme weather events, owing to growing levels of exposure and climate variability, experienced by individuals, business and government, has propelled decision-makers to consider insurance industry as an option to understand current and future risks and manage the financial and economic consequences of disasters, by enabling the critical funding for disaster response, recovery and reconstruction.

1.1. Understanding insurance and slow onset events

In 2011, approximately 106 million people were affected by climate weather related events¹, with major impacts in developing countries. These countries are particularly vulnerable to loss and damage resulting from climatic change not only due to their uneven geographical distribution in low-lying islands and arid regions (IPCC, 2012), but also because of the different levels of exposure, vulnerability and coping capacities. For example, Figure 1 demonstrates that since 1980 there is an upward trend in the frequencies of weather-related loss events in both rich as well as in poor countries. In turn, focusing on ways to manage climatic risks in developing countries becomes increasingly important in the coming years. There are very real limits to how far human systems and ecosystems can adapt to most of the slow-onset processes. A distinction is made between “rapid onset” and “slow onset” events. A rapid onset event may be a single, discrete event that occurs in a matter of days or even hours, whereas slow onset events evolve gradually from incremental changes occurring over many years or from an increased frequency or intensity of recurring events (Siegele, L. 2012).

In 2010, the Conference of Parties (COP), agreed on “Decision 1/COP.16”, that slow-onset events is to be sea level rise, increasing temperatures, ocean acidification, glacial retreat and related impacts, salinization, land and forest degradation, loss of biodiversity and desertification (Hoffmaister, J. & Stabinsky, D., 2012). These processes are gradual and increase over time with large scale impact. The continual adjustment of human and ecosystems can slowly become impossible as the report *Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation* (IPCC 2012) predicts high temperatures and sea level rise (IPCC, 2012), will lead to uninhabitable and unproductive territories. Scheffer et al. (2001 & 2002), for instance, find thresholds in the resilience of kelp forest ecosystems, coral reefs, rangelands and lakes affected both by climate change and other pollutants (Adger, W.N. et al., 2007). As the global temperature increases, there will be a reduction in moisture of soil, rendering land arid for cultivation in entire regions; groundwater aquifers in coastal areas will become too saline to consume (Stabinsky, D & Hoffmaister, J. 2012), and so on. Consequently, these will result in permanent and irreversible loss and damage on assets and livelihoods in various regions, predominantly in developing countries.



Figure 1: Annual numbers of loss relevant weather events globally 1980 - 2011 in countries belonging to different income groups.

In recent years, there has been discussion on the suitability of insurance to manage slow onset events in vulnerable countries. It has been highlighted that traditional loss-based insurance may not be suitable to insure against longer-

term foreseeable climatic stressors because slow-onset events fail two preconditions for insurability: unpredictability of an event (losses should be sudden and cannot be foreseen) and ability to spread risk over time and regions (UNFCCC, 2012). Thus, for example, glacial retreat and salinization do not meet the insurance criteria as both processes are slow and involve continuous change that potentially effect more than one area. Therefore, greater emphasis should be placed on resilience building and on finding innovative approaches to address slow-onset events.

Consequently, the paper shows to what degree risk transfer mechanisms are applicable to manage loss and damage associated with slow onset climatic risks in developing countries. The specific objectives include:

1. Understanding to what degree can risk transfer tools manage loss and damage from slow-onset events?
2. Inform policy discussions with the aim of introducing alternative risk transfer tools such as insurance to manage loss and damage from slow-onset events in developing countries.

In order to achieve these objectives, the authors examined the following: analysis of policy process to identify key questions; expert interviews with private, and public-private financial industry groups to assess the applicability risk transfer tools to manage loss and damage related to slow onset events[†]; and literature review of case studies.

1.2. Managing climatic risks in the 21 century

Historically, developing countries that have experienced loss and damage related to disasters have had to divert funds from their national budget or obtain loans and donations from the international community. However, such measures are not always timely nor are they financially adequate, which put additional strain on the national budgets (Warner, K., et al. 2013). Insurance provide financial liquidity shortly after a disaster and can help to reduce the indirect effects of damage, by prompting payouts that helps alleviate human suffering, decrease loss of livelihoods and lessen setbacks to development. There are numerous examples of how insurance is being used to manage climate risks. For example, weather index based insurance is providing low-income households with financial coverage for climate risks in Bolivia, Malawi, India, Mongolia, Sudan and Ethiopia. Some governments also rely on multi-country approaches that diversify their risks regionally such as the Caribbean Catastrophe Risk Insurance Facility (CCRIF). The most recent initiative is the African Risk Capacity Facility, modeled on CCRIF but developed specifically to manage climatic risk if droughts in Africa. Despite these cases, many developing countries still have low non-life insurance penetration as depicted in Figure 2 below.

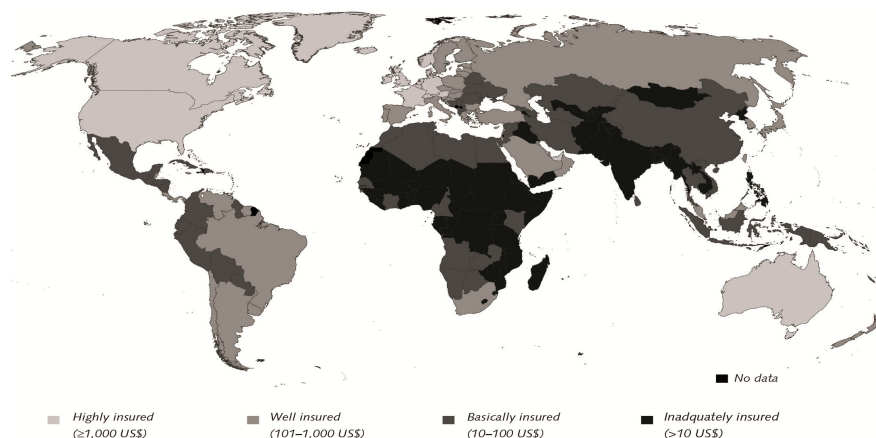


Figure 2: Insurance penetration worldwide, 2012

[†] The interviewees were strategically identified based on their organisations past and current involvement with managing loss and damage in both developed and developing countries. The overall sample target was 4 individuals, in three different continents.

2. Approaches to reduce loss and damage associated slow-onset events

Parties to the United Nations Framework Convention on Climate Change (UNFCCC) have increasingly expressed more interest in knowledge and understanding of comprehensive risk management approaches including risk transfer instruments such as insurance to address loss and damage with the adverse effects of climate change including extreme and slow-onset events. The recent UNFCCC climate negotiations in November 2013 (the 19th Conference of the Parties) established at the Warsaw International Mechanism that will work on identifying appropriate responses to negative climate change impacts including slow-onset events.

One of these responses is insurance as a risk management tool. Insurance provides many benefits to stakeholders - ranging from regions, national governments and communities, to households and individuals. When confronted with covariant risks associated to climate impact, risk transfer tools can provide surety to governments to finance residual risks after effective risk reduction measures have been implemented. Risk transfer tools such as insurance, are designed to transfer risk to a third party – reinsurance company or capital market. Potentially, these tools can support government by managing budget volatility by transferring risk to international financial market.

Risk transfer tools alone would not suffice to address some of the dire effects of climate change, which again points to the need for a holistic approach to managing climate risks (Warner, K., et.al. 2012). Numerous international initiatives have focus on reducing, pooling, and sharing climate-related disaster risk, particularly through risk financing approaches for transferring private and public sector risks from local and national levels to a global scale (World Bank., 2011). The ultimate goal of such strategies is to create a less risky distribution of people and assets within a country or, where people and assets are exposed, to make sure that adequate measures are in place to protect them from hazards (Mitchell, T., et al., 2012). Therefore creating a platform where each state is responsible for its citizens' safety and protection, and ultimately reducing the need for international involvement in emergencies, and guarantee greater dignity for the beneficiaries than aid appeals. However, some form of public sector involvement is inevitable (Silver, N & Dlugolecki, A., 2009) to ensure the implementation and effectiveness of risk management, such as flood protection, irrigation systems and other governance related schemes have already been implemented, are in place (see figure 3 below).

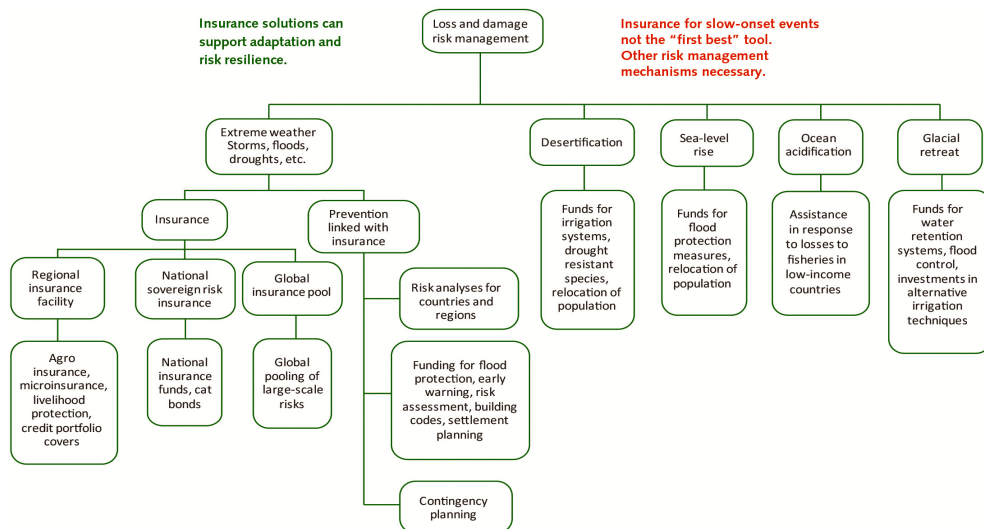


Figure 3: Tree of options for Climate Risk Management

2.1. Risk pooling innovation for island states: Caribbean Catastrophe Risk Insurance Facility

CCRIF is the world's first multi-country index-based catastrophe insurance pool and offers immediate liquidity in the aftermath of earthquakes and hurricanes. Although, these do not particularly target slow onset events the flexibility of insurance and the industry can further transform these products to develop new and innovative tools to manage climate risks. The Caribbean Catastrophe Risk Insurance Facility (CCRIF) became operational in June 2007 with the participation of 16 Caribbean countries. The facility can transfer the risks it cannot retain to the international financial markets through reinsurance, catastrophe bonds, or other financial instruments. Regional catastrophe insurance pools, such as the CCRIF, can facilitate access to the reinsurance markets on competitive terms by pooling country-specific risks into a single, better structured portfolio. They create new business opportunities to the reinsurance industry, which may not have otherwise approached these countries on an individual basis because of the high transaction costs.

Risk reduction measures is enabled by providing governments with access to hazard maps and information on hazard impacts on populations, land area, ports and airports. According to interviewees recognizing that climate change will greatly impact the island states, and CCRIF is reportedly investing significant resources in the development of a quantitative knowledge base for key future climate change risks such as slow onset events and adaptation strategies for decision making.

2.2. Benefits and limits of risk transfer tools for slow-onset climatic events

According to recent report by the G20 Finance Ministers and Leader in 2012, a number of innovative new risk ex ante financing solutions have appeared in recent years, such as catastrophe bonds, weather or index-based derivatives, micro-insurance and traditional disaster insurance. However in order for emphasis to be places on risk transfer mechanisms as widespread mechanism for risk reduction, the overall benefits and challenges needs to be evaluated.

2.2.1. Benefits

- Designing innovative risk transfer tools can help develop national distribution network, in order to be accessible to the people with low income and high risk (Silver & Dlugolecki., 2009).
- Insurance necessitate risk assessment, therefore identifying critical risk reduction measures, such as increase risk management awareness, government investments and incentivitise risk reduction activities by individuals (OECD , 2012). The insurance industry has the experts and the capacity to gather and assess data necessary for understanding regional climatic risks and vulnerability.
- By making disaster risk reduction an integral part of national policies and regulation, risk transfer tools will allow for long-term planning particularly for slow onset events for sustainable development and poverty reduction (Pierro, R & Desai, B., 2011).
- Risk transfer tools implemented correctly are reliable and timely for beneficiaries and local economies by providing immediate fund for disbursements in the event of a disaster.

2.2.2. Limits

- The low demand for risk transfer mechanisms in developing countries is due to lack of awareness.
- Lack of data on risk and exposure further creates gap in availability of insurance coverage for developing countries.
- There is difficulty in identifying and mapping all the possible hazards associated with slow onset, additionally including social protection activities as a part of risk transfer tools, can create a problem particularly in vulnerable countries with weak governance system and institutional framework.
- Large scale impact of slow onset events hinders pricing and insurability of associated risks (due to the fact that they are not sudden or accidental; a prerequisite for insuring).
- Lack of evidence on the effectiveness of the current disaster risk transfer tools creates challenges for stakeholders wishing to make informed decisions on how to best invest in disaster resilience.

3. Towards designing a comprehensive climate risk transfer tool for slow onset events

Typical non-life insurances and parametric insurance policies are short-term, 1 to 3 year policies, which is appropriate for rapid onset events. However, the impacts of slow onset events of climate change are over a long time frame. According to Silver, N et al (2009), the long term risks nature constraint the capital requirements of many non-life insurance companies to write policies similar to that of life or health insurance that includes long time frame and inevitable loss. Nevertheless, in order to manage the effects of slow onset events, the current risk transfer tools has to consider a paradigm shift, to include risk reduction measures, policies with multiple years and innovation in parametric trigger to reflect the impacts of slow onset events.

3.1. Case Studies

Multi-year insurance contracts based on closely specified products like weather derivatives and catastrophe bonds, for example regional catastrophe pool such as CCRIF, can facilitate access to reinsurance markets on a competitive term by pooling country/specific risk into a single well designed product to manage impacts of extreme event such as cyclones or hurricanes. Subsequently, the Africa Risk Capacity (ARC) is specifically modeled to reflect Africa's weather and food security context, with the criteria of eligibility to qualify as member country being developing and implementing a comprehensive national drought management plan.

'Life insurance' concept is similar to life and pensions insurance, where funds are accumulated over a long period; although, disaster financing is compared to property insurance and reinsurance. If suitably designed, life insurance concept provides a way to transfer sufficient funds so that an alternative economic and even geographical configuration could be planned, financed and established over a period of years. Arriving at the compensation payable from changes in the trigger variable would have to be based on a stakeholder and expert consultation process, since the intention is to capture a range of possibilities in which harm to the economy might arise.

Redefining parametric instruments such as CCRIF and ARC provide incentive for the policyholder to engage in risk reduction behaviors. Eligibility is precondition on national contingency drought plans, as is the case with the ARC. The design of risk transfer instruments such as the index insurances used in ARC initiative can contribute to sustainable development and lessen the impact of slow onset event on vulnerable groups. In order to facilitate the effective implementation of alternative risk transfer tools, policy holders should have direct and unlimited access to the information on how payout will be calculated. Parametric coverage based on an independent proxy for losses, for example rainfall pattern, can be adjusted or developed to be based on parameters that captures the progress of changing climate in a region with exposure to similar risks (Silver, N et al 2009). For example the trigger of payout will be the annual change in climate; annual rise temperature and rise in sea level. Furthermore, the World Bank is 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 not just precipitation, but include inundation as a parameter and which raises the hope of possibility of future innovation.

4. Promising approaches for risk transfer tools and insurance

The foresight of including risk transfer tools and contingency plans in the institutional structure of countries to buffer pending risks provides security against loss and damage to assets and livelihoods and the vulnerable poor are safe from resorting to coping strategies such as forced migration, sales of assets, money lending and reduction of food consumption (Warner, et al. 2009).

4.1. Linking risk transfer instruments to address slow-onset events

The urgency of establishing climate resilience through risk measures and risk transfer instruments is imperative due to the expected changes in weather variability and its impact on different regions and countries.

Example: Insurance incentive for slow onset events: Boiler Inspection and Insurance[‡]

In the mid-to-late nineteenth century, there was ‘Industrial Revolution’ developed in the United State of America. A great deal of manufacturing was carried on by small plants located in rural areas, with water from streams and rivers as the source of power for equipments. During which boilers, used to drive industrial machinery, locomotives and steamboats, were everywhere. However, water power had reached the limits of its industrial capacity. As applications for steam power became more complex, the dangers also became more acute. In the 1850’s, explosions were occurring at the rate of almost one every four days, with the 1865 explosion of the Mississippi River steamer Sultana, took over 1,200 lives. These trigger Polytechnic Club founders of ‘Boiler Inspection’ established the idea to combine insurance with a boiler inspection. They reasoned that inspections would increase boiler safety and the insurance would function as an incentive to inspect and a guarantee of a quality inspection. Though the insurance offered financial interests, it was secondary to safety and loss prevention – a totally new concept for an insurance offering. Today the concept of boiler inspection is now incorporated in countries around the world.

Designing risk transfer tools with risk reduction and or loss and damage activities, like the boiler inspection as a perquisite, have great potential to mitigate the human and economic disaster loss and damage (Linnerooth-Bayer and Mechler, 2006). Including boiler inspection in insurance at a time when steam power created a new industrial hazard - disastrous boiler explosions - shows the expertise, innovative and coverage capacity of the insurance and insurance industry.

With the current debate of insurance and/or risk transfer tools to manage slow onset events of climate change, the insurance industry has the expertise to design policies and set incentives for countries to assess and address the risks of slow onset events, like the innovation of the boiler inspection. Furthermore, the insurance industry has the potential to assist in determine the appropriate risk management programmes to inform decision making processes.

5. Contingency plans and risk transfer tools

Contingency planning enables the development and response mechanisms for the worst case scenario of disasters, by fostering an agreement on what a potential emergency could look like, and what different organizations will do to respond (Rosier, 2011). The in-depth analysis conducted during scenario development can identify indicators or parameters that can be linked slow onset event and translate early warning for early action. This is also a risk reduction approach to minimize loss and damage through deployment of funds, to ensure that the expense associated with having access to rapid liquidity after a disaster is fully leveraged. Africa Risk Capacity facility is such an initiative for which access to the facility is linked to the existence of a credible contingency plan or framework for drought risk management within a country.

Example: African Risk Capacity (ARC): Insurance and early response through contingency plans.

The objective of this facility is to help African countries deal with the effects of drought. Africa, being an agricultural feed continent relies on the adequate seasonal rain necessary for sufficient crop yield. Over the years, African countries regularly experience drought, which more often than not threaten food security and livelihood of population. The World Food Programme with the support of the World bank helped to establish the ARC facility by linking insurance payouts to effective response and contingency plans. ARC aims to help African governments reduce the negative impact of droughts on the lives and livelihoods of the vulnerable, while decreasing reliance on external aid.

6. Conclusion

In general, risk transfer tools applicability to manage slow onset events is to promote risk reduction activities in a broader concept of insurance policies through innovative product design and looking beyond the current limitations of slow onset events. The risk transfer tools and risk managers can play an active role in raising awareness of risk and climate change through risk education and disseminating high-quality risk information (Niehörster, F. 2012).

[‡] The Hartford Steam Boiler Inspection And Insurance Company (2013): The History of Hartford Steam Boiler

This can and should be done in collaboration with local authorities through engagement in public–private partnerships. A concerted effort among climate change experts, risk managers, the research community, civil society representatives, governments, and donor institutions is needed to consider future impacts and strategies to adjust to the new and emerging risks. Without this assistance highly exposed and fiscally unstable developing country governments cannot fully absorb the risks and uncertainties of the projected loss and damage from slow onset events.

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