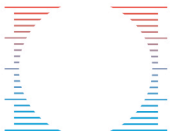

Centre for
Climate Change
Economics and Policy

Grantham Research Institute on
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the Environment

# Response to European Commission's Green Paper on the Insurance of Natural and Man-made Disasters

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**Centre for Climate Change Economics and Policy**

**Grantham Research Institute on Climate Change and the Environment**

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**Summary of key points**

- Insurance is one tool amongst others in a holistic natural disaster risk management strategy. Risk transfer alone, without consideration of risk reduction efforts, is not a sustainable solution going forward, particularly in the context of a changing climate.
- A wide variety of insurance penetration rates across the EU exists, and more data is needed in order to assess the underlying factors that drive demand for and supply of disaster insurance. What emerges from the experience of natural catastrophe insurance around the EU is that there is no 'one size fits all' solution.
- In theory risk-based pricing should help prevent moral hazard and promote risk reduction behavior. Evidence of how this works in practice is limited. Due to affordability concerns this may have to be linked to public financial support measures at least on a temporary basis.
- There is evidence of a range of further activities conducted by the insurance industry to foster disaster prevention efforts, but it remains unclear to what extent they are effective at household level and to what extent they could be scaled up if deemed a success.
- Other actors, such as property developers, home-builders and mortgage providers, should be considered alongside homeowners and tenants when tackling moral hazard and enhancing risk reduction efforts through insurance.
- A greater degree of product innovation both for public and private disaster insurance schemes should be fostered.
- The EU's efforts to support development of disaster insurance in developing countries should have a clear focus on linking risk transfer and risk reduction.

## Introduction

The Grantham Research Institute on Climate Change and the Environment and the Centre for Climate Change Economics and Policy at London School of Economics and Political Science welcomes this opportunity to respond to the European Commission's Green Paper on the insurance of natural and man-made disasters. We view insurance as one tool amongst others in a holistic disaster risk management strategy. Insurance alone, without consideration of risk reduction efforts, is not a sustainable solution going forward, particularly in the context of a changing climate.

The Centre for Climate Change Economics and Policy has investigated the role of insurance in climate change over the last five years through a programme on 'Evaluating the economics of climate risks and opportunities in the insurance sector'. This academic programee is a collaboration between the Centre for Climate Change Economics and Policy and Munich Reinsurance Company. It is a comprehensive research programme that focuses on the assessment of the risks from climate change, and on the appropriate responses, to inform decision-making in the private and public sectors. A number of activities are being carried out as part of the programme, including the publication of technical papers and industry briefings, symposia, business roundtables and workshops.

The Grantham Research Institute has also recently joined the Enhancing Risk Management Partnerships for Catastrophic Natural Disasters in Europe (ENHANCE) research consortium to lead work on insurance and flood risk. The main goal of the ENHANCE project, funded by EU FP7, is to develop and analyse new ways to enhance society's resilience to catastrophic natural hazard impacts, by providing new scenarios and information for selected hazard cases, in close collaboration with stakeholders, and by contributing to the development of new multi-sector partnerships (MSPs) to reduce or redistribute risk. The Grantham Research Institute leads the insurance component of the ENHANCE project.

## Response to selected questions

**Questions**

**(1) What is your view on the penetration rate of disaster insurance in the European Union? Please provide details and data to support your arguments. Is more research needed to understand any possible gaps in insurance supply and demand, insurance availability and coverage?**

The use of insurance to manage the impacts of natural disasters is unevenly distributed across the EU, with the extent and scope of risk transfer varying from country to country. One source of empirical evidence for these are multi-country overviews, such as the summaries of existing natural catastrophe insurance schemes provided by Insurance Europe or the Spanish Consorcio. While these overviews are mainly descriptive and illustrative, they provide an outline of the wide range of different types of insurance schemes in operation – ranging from private market solutions to publicly funded risk pools, including compulsory schemes and completely voluntary offerings (CCS, 2008; CEA, 2009). The data provision is fairly limited – for most countries this is based on aggregate estimates – and more specific breakdowns of who buys insurance (gender, age, social status and other aspects) are generally not available. The aggregate penetration data also does not differentiate between public and privately provided insurance cover. The current picture therefore does give an indication of insurance levels in a country, but does not allow more detailed analysis of their features.

Insurance penetration is an indicator of supply of and demand for insurance. The main drivers of insurance demand can vary over time and between countries. Indeed, insurance penetration can fluctuate significantly each year in response to, for example, recent losses, changes in market conditions (which affect the price and availability of insurance) and local policy changes.

(Ranger & Surminski, 2013). In the case of natural catastrophe cover in the Europe Union, insurance differs between countries for historical reasons, as well as due to different risk cultures, perceptions and risk management approaches.

On the supply-side, insurers' willingness to offer coverage can be influenced by their loss experience. Born & Klimaszewski-Blettner (2012) investigate the impact of natural disaster losses and regulation on the supply decisions of property insurers in the United States. Their empirical evidence suggests that homeowners' insurers are more likely to reduce their cover supply in response to unexpected severe events, while commercial lines insurers appear less likely to change their coverage in response to changes in severity or frequency of loss events (Born & Klimaszewski-Blettner, 2012). No similar research has been conducted in markets across the EU, but it is obvious that after a flood event, for instance, private insurers review their market position, pricing and coverage offers – which may trigger a re-assessment of the way flood insurance is provided, as currently seen in the UK. This shows that rising losses can challenge the insurability of risk by the private market and may force the public sector to play a bigger role in the risk transfer. The system in the UK, until this year, was entirely run by the private sector. However, the UK seems likely to create a private market pool, initially supported with public money, for those high risk properties that are not insurable at affordable prices in the private market (DEFRA, 2013).

**(4) How can state or state-mandated disaster (re-)insurance programmes be designed and financed to prevent the problem of moral hazard?**

Moral hazard is a key challenge for any insurance product, but is a very acute problem particularly in the field of disaster insurance because it can

undermine the economic benefits of risk transfer and the wider efforts to reduce risks.

While stakeholders have only limited direct control over the occurrence of a natural disaster, their actions determine the extent of losses during and after the event. Therefore moral hazard can occur at government level, where the existence of an insurance scheme may reduce the urgency to prevent and reduce risks, or at the insured level, where the purchase of insurance may lead to a false sense of security. Moral hazard can also occur with other stakeholders, such as property developers and mortgage providers.

The finance and design of natural disaster insurance is crucial if moral hazard is to be avoided or reduced. The aim should be for insurance to contribute to physical risk reduction. We note a broad agreement in the literature about the theoretical potential for insurance to reduce flood risk (Crichton, 2008; Paudel, 2012; Surminski & Oramas-Dorta, 2011), but the evidence of how this is implemented and its effectiveness is very limited. The scholarly debate has mainly focused on the United States National Flood Insurance Program (see Michel-Kerjan & Kunreuther, 2011), and on flood insurance schemes in some European countries, such as France and the UK, as discussed by Crichton (2008). In the UK, the so-called ‘Statement of Principles on the Provision of Flood Insurance’ between insurers and government spells out the need for better flood risk information, stricter planning policy and more investment in flood defences as a condition for flood insurance provision by the private market. This approach is currently under review, as risk levels continue to rise, despite these reduction efforts. Therefore understanding how risk reduction can be linked to risk transfer is very important. The Grantham Research Institute, through the ENHANCE project, will explore this in greater detail, with the aim of developing a methodology to critically assess risk reduction efforts linked to insurance.

**(6) Could risk-based pricing motivate consumers and insurers to take risk reduction and management measures? Would the impact of risk-based pricing be different if disaster insurance was mandatory? Do insurers in general adequately adjust premiums following the implementation of risk prevention measures?**

Risk-based pricing is often seen as the basic tool to prevent moral hazard. In this context, insurance can become an instrument to provide incentives and to steer behavior towards loss prevention. The foundation for this concept is the recognition that insurance premiums can send risk price signals. How this works in practice is less clear. The biggest challenge of risk-based pricing is to maintain affordability. Picard (2008) highlights the trade-off between the effectiveness of risk-based pricing and equity, highlighting that the most vulnerable may not be able to pay for high risk-based premiums.

It is often not clear how risk-based pricing impacts on supply and demand for insurance, as well as on implementation of flood risk reduction measures. Some recent studies have explored the link between risk reduction measures and premium pricing, through methods such as interviews with insureds, hypothetical modelling and willingness-to-pay exercises. Thieken *et al*. (2006) found that, in Germany, insured households are more likely to undertake risk reduction measures than uninsured ones, suggesting that risk-based flood insurance creates an incentive for policy-holders to take action. In the Netherlands, Botzen, Aerts & van den Bergh (2009) suggest that many homeowners would be willing to make investments in risk reduction if they would lead to an insurance premium reduction. (Botzen, Aerts & van den Bergh., 2009).

An important factor is the scale of the potential premium reduction versus investment required to reduce risk. Property-level risk reduction measures, such as flood guards, resilient basements or over-flows, require a significant

investment from the property owners. A potential reduction in flood insurance premiums to reflect lower risk might help to raise the willingness to undertake these measures, but further incentives, for example tax relief or grants, may be required to trigger action at household level. In the UK, this topic has been extensively discussed between industry and government, but without much progress on the ground. From the point of view of the insurer, there are concerns about the quality and effectiveness of property-level flood reduction measures, as well as accurate installation and usage, which make significant premium reductions unlikely. Quality assurance schemes as well as further investigations into cost-effectiveness may be required in order to introduce this on a larger scale.

**(9) Is there a case for promoting long-term disaster contracts? What would be the advantages/drawbacks for insurers and the insured persons respectively?**

A recent study by Maynard & Ranger (2011) provides a quantitative analysis of the implications of multi-year contracts for the technical price of insurance. It finds important limitations for multi-year contracts. In particular, Maynard & Ranger (2011) argue that the annual cost of a multi-year contract would be higher than an equivalent annual contract. They find that even under conditions of known and stationary risk (an optimistic scenario compared to the real world of changing and uncertain risks), initial capital requirements could be 50% higher and the annual premium around 5.5% higher for a 10-year contract than an annual contract.

In the real world, additional factors, in particular the ambiguity involved in anticipating long-term risk, could push premiums even higher. Further disadvantages are lower flexibility for policy-holders, lower flexibility for the

insurer, and less efficient use of capital, as well as an increase in the risk of insolvency for insurers.

Nevertheless, Maynard & Ranger (2011) suggest that there may be greater opportunities for multi-year contracts in the commercial insurance business and for high net worth individuals. In addition, multi-year insurance contracts may have greater prospects in purely public insurance schemes (e.g. the United States National Flood Insurance Program), as these schemes may have lower capital requirements, so the difference in price between multi-year and annual contracts would be lower and the risk of future liabilities are less of a concern as the issue of insolvency may be less problematic for public compared to private insurers.

**(11) Do deductibles, excesses co-insurance and other exclusions effectively prevent moral hazard? What alternative terms and conditions could be appropriate for disaster insurance, given that the insured party may be unable to take effective risk reduction measures against a disaster?**

For some time now, the private insurance industry has been applying these instruments under the terms and conditions of insurance contracts. These aim to prevent moral hazard, but also seek to maintain the insurability of high risk properties. This is evident in the UK residential property market. While the application of these tools is well established in some insurance classes (such as commercial insurance for large risks and motor insurance), the effectiveness in reducing moral hazards in relation to residential natural catastrophe risks remains unclear. This is one area that the ENHANCE project will investigate.

There is evidence of a range of activities conducted by the industry to foster prevention efforts. Surminski (2010) provides an illustration of how some insurers are engaged in risk reduction activities. The initiatives identified include raising awareness of disaster risks, promoting action by government, and supporting action by individuals through incentives, information, financial support and terms and conditions for policies. Despite these initiatives, it remains unclear to what extent they are effective and how they could be scaled up if deemed a success. Assessing the effectiveness of a risk transfer scheme in avoiding moral hazard and incentivising risk reduction goes beyond pure economic cost-benefit analysis, and needs to include the recognition of different stakeholder objectives, such as vulnerability reduction, commercial viability, affordability, and the financial sustainability of a scheme in the context of changing risk levels. This is an area that will require further work and pilot projects. The Grantham Research Institute is leading this workstream within the ENHANCE project. The aim is to develop a methodology to evaluate how existing insurance schemes can contribute to risk reduction.

**(15) How can the Union most effectively help developing countries to create solutions for financial protection against disasters and shocks and what should be the priority actions? What types of partnerships with the private sector and the international institutions should be pursued for this purpose?**

Managing current and future risks is particularly challenging for developing countries, as they often lack resources and expertise, but face more extreme weather conditions now and in the future than the EU. Most developing countries experience very low insurance penetration rates due to a range of

factors such as high transaction costs, lack of financial literacy and lack of access to affordable products in remote rural areas (Ibarra & Skees, 2007).

While risk transfer is not a 'silver bullet' for all of the climate risks faced by developing countries, there is evidence that it can play a cost-effective role in a country's efforts to increase its resilience, especially when compared to ex-post disaster aid. If applied correctly, risk transfer has the potential to be an important part of a country's adaptation and economic development plan. At the same time there is evidence that a poorly-designed risk transfer scheme can create moral hazard and reduce incentives for risk reduction (Ranger, Surminski & Silver, 2011).

The recently published Compendium of Disaster Risk Transfer Initiatives in the Developing World offers a snapshot of current risk transfer activities in low- and middle-income countries. (Surminski & Oramas-Dorta, 2011) The Compendium documents 123 existing initiatives in middle-income and lower-income countries that involve the transfer of financial risk associated with the occurrence of natural hazards. The analysis by Surminski & Oramas-Dorta (2011) of the Compendium suggests that the potential for utilising risk transfer for risk reduction is far from exhausted, with only very few schemes showing an operational link between them, while the effectiveness and implementation on the ground remains unclear.  The dearth of linkages between risk reduction and insurance is a missed opportunity to address rising risk levels, particularly in the context of climate change. Rising risk levels pose a threat to the insurability of properties against floods, and insurance without risk reduction elements could lead to moral hazard. Therefore a closer linkage between risk transfer and risk reduction could make this a more sustainable and robust tool. The EU's efforts should enhance this risk reduction focus, as can only insurance contribute to long-term risk management within a valid risk reduction strategy in a changing climate.

**(21) This paper addresses specific aspects related to the prevention and insurance of natural and man-made disasters. Have any important issues been omitted or underrepresented? If so, which?**

We identify three areas that will require greater attention.

Firstly, the discussion about natural catastrophe insurance needs to be viewed in the context of climate change. For those who provide insurance risk transfer, the challenge of climate change creates new risks, but also opportunities. And it creates the need to consider long-term implications, particularly for insurability. Ranger & Surminski (2013) identify positive and negative scenarios for insurance resulting from differences in policy responses to climate change, regulatory levels, company strategy, risk awareness and willingness-to-pay. While this analysis focuses on emerging markets, parallels with natural catastrophe insurance in the EU can be drawn: "While many of the factors that define the scenarios cannot be controlled by the insurance industry, others are at least partly dependent on how the industry itself responds to the challenges of climate change." (Ranger & Surminski, 2013)

Secondly, more attention should be paid to the roles and responsibilities of public and private sector players and how new partnerships, beyond insurance and government, could lead to innovation. Providing disaster insurance is challenging – there is ample evidence for this around the world, where governments are struggling with effective solutions. One common response to this is 'partnership'. When the challenge is deemed too big to be dealt with by one type of actor alone, the suggested solution is close collaboration between public and private stakeholders. The term 'partnership' is very broadly used, but has its roots in efforts to increase efficiency of public service by engaging the private sector. From an economic perspective, partnerships delivering a service or a public good have a long history. Economic theory provides a framework for assessing the effectiveness and

economic value of a partnership (Bettignies & Ross, 2010) by calculating impacts on economic efficiency and aggregate social welfare, applying cost-benefit analysis as well as market-centred and social valuations (Scott, 2009). What is less clear are the rules of these partnerships and how they can deal with changing risk levels. The current flood insurance arrangement in the UK can be seen as such a 'partnership': a joint approach with roles and responsibilities divided between government and insurance. But as the current discussion shows, this partnership faces severe strain. Public and private insurance is operating under very different conditions, which has implications for how issues, such as moral hazard and risk reduction, can be addressed. The ENHANCE project is assessing the characteristics of (un)successful partnerships in improving resilience, and aims to identify processes for fostering novel multi-sector partnerships (MSPs).

Thirdly, on the supply-side, the European Commission should encourage a greater degree of product innovation with private and public insurance providers. The scale of this should be very broad – from sovereign risks to individual homeowner risks. Regulatory or market barriers that may prevent product innovation in disaster risk reduction also need to be explored. There is anecdotal evidence of how some policies and regulations may hamper product innovation or data transparency. The ENHANCE project aims to identify barriers, normative gaps, and synergies with existing regulatory and economic policy instruments for disaster risk reduction. This should be a key focus for the European Commission.

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