



INSURANCE INSTRUMENTS AND DISASTER RESILIENCE IN EUROPE - INSIGHTS FROM THE ENHANCE PROJECT



The ENHANCE project has received funding under the Seventh Framework Programme of the European Union under grant agreement No 308438

Authors: Swenja Surminski(1), Jeroen Aerts(2), Wouter Botzen(2), Paul Hudson(2), Jaroslav Mysiak(3)

Affiliations: (1)The Grantham Research Institute on Climate Change and the Environment, London School of Economics (LSE), UK; (2)Institute for Environmental Studies (IVM), VU University Amsterdam, The Netherlands; (3)Fondazione Eni Enrico Mattei (FEEM), Italy.

For more information about ENHANCE: Jeroen Aerts jeroen.aerts@vu.nl

ENHANCE project: Improving risk management partnerships for catastrophic natural disasters in Europe

Europe is vulnerable to most types of natural disasters. Recent events, such as the flooding in France, remind us that loss of lives, impacts on communities and disruption of economic activity continue to pose significant challenges to decision-makers at all levels.

Efforts to increase our current and future resilience are becoming more urgent: climate change, detrimental land-use practices and the increase of assets located in harm's way suggest that the social and economic impact of extreme events will continue to rise.

Responding to these challenges requires collaboration across different stakeholder groups and disciplines. This was underlined by the Sendai Framework for Disaster Risk Reduction 2015-2030, which highlights that disaster risk reduction (DRR) requires the engagement of a variety of actors across sectors, partnerships between different stakeholders and across governance levels, and a clearer definition of responsibilities across public and private stakeholders.

Improving multi-sectoral collaboration is one of the core aims of the project 'Enhancing risk management partnerships for catastrophic natural disasters in Europe' (ENHANCE), FP7 research consortium, led by the Institute for Environmental Studies, VU University Amsterdam. Under ENHANCE new risk scenarios and hazard information have been developed and shared with multi-sectoral stakeholders across different case studies, in order to support the development of innovative approaches to DRR.

Insurance is one instrument that could benefit from increased collaboration across stakeholders. Currently, the provision of insurance against natural hazards varies widely across Europe, with countries demonstrating differing degrees of coverage types, penetration rates, demand and design of schemes, ranging from private sector solutions to solidarity-based public funds. While administered nationally or even sub-nationally, this patchwork of insurance mechanisms has recently received the attention of EU-policy makers: The EC Green Paper on the Insurance of Natural and Man-Made Disasters questioned the appropriateness and availability of current insurance options in the context of rising risk, and asked if and how the provision of insurance could be reformed.

In the case studies below, ENHANCE is investigating how existing insurance schemes could be reformed and new schemes designed to utilise the prevention role of insurance and foster multi-sectoral partnerships.



 <p>Multi-hazard risk assessment in Po River basin (IT)</p>	<p>Flooding and drought pose two major concerns in the Po River Basin. Whereas state-subsidised agricultural yield insurance is in place, flood insurance uptake remains low and disaster losses are typically compensated by the state. The role of agricultural insurance in wide-reaching water management reform is analysed and the opportunities are shown for disaster risk reduction through cooperative agreements and partnerships.</p>
 <p>Flood risk and climate change implications for Multi Sector Partnerships (UK)</p>	<p>Delivered by private insurers, the current all-encompassing scheme is due to change to a new pooled approach to cover only those households at highest risk with no financial remit from the state. Some risk reduction elements are in place and the design of the new scheme is fundamental to its longevity.</p>
 <p>Insurance and forest fire resilience in Chamusca (PT)</p>	<p>Forest insurance is mandatory yet insurance products are scarce in delivering insurance solutions. Challenges are highlighted and the approaches of the four existing forest insurance schemes are detailed.</p>
 <p>Flood risk management for critical infrastructure (NL)</p>	<p>Provision of flood risk management in a high risk area presents several challenges for effective application and an innovative multi stakeholder approach aims to deliver a reduction in societal risk.</p>
 <p>Reforming natural hazard insurance (RO)</p>	<p>Mandatory natural hazard insurance is required under law for residential properties in Romania yet includes no risk reduction elements.</p>
 <p>Reforming the European Union Solidarity Fund in support of insurance</p>	<p>Using a supranational fund such as the European Union Solidarity Fund could provide a link to potential ex ante capitalisation of disaster funding for risk reduction action.</p>



Four Insights on how to use multi-sectoral partnerships to improve the risk reduction component of insurance.

Four insights from ENHANCE case studies on the use of disaster insurance in Europe, and lessons on how to use multi-sectoral partnerships to improve the risk reduction component of insurance.

1 RISK ASSESSMENT AND DATA GATHERING ARE IMPORTANT FOR IMPROVING MULTI-SECTORAL COLLABORATION AND FOR DEVELOPING RISK TRANSFER SCHEMES.

In-depth assessments of natural disaster risks are a vital part of the ENHANCE project, as outlined in the recent ENHANCE policy brief on risk assessment. Such assessments are important for guiding the development of risk transfer schemes. For example, ENHANCE case studies examine how to develop forest fire insurance in Portugal and flood risk transfer schemes in Rotterdam. These case studies use risk assessment for obtaining a good understanding of the risk faced to guide tailored risk-transfer solutions. Another example of such a study is an EU-wide assessment of river flood risk which has been undertaken to estimate current risk levels as well as how these may develop in the future as a result of climate and socio-economic change. The basic method is a probabilistic catastrophe model of about 1,000 large river basins in the EU. Model results show that current average annual flood risk is about €5 billion which may increase up to €24 billion by 2050 because of socio-economic development and climate change. These results have been used for a stress test of the EU Solidarity Fund that can provide limited amounts of financial aid to the governments of EU countries hit by a natural disaster. The model results show that by 2050 the fund's insolvency probability may be 80% higher than under its previous structure, and that in addition the magnitude of uninsured flood losses may increase.

The results of this risk assessment, which have been widely disseminated, highlight the need for the EU to consider enlarging the financial capacity available to the EU Solidarity Fund in the future and/or to expand the insurability of flood risk.



2 THE USE OF INSURANCE TO INCENTIVISE RISK REDUCTION IS POSSIBLE, BUT NEEDS TO BE CAREFULLY DESIGNED AND TARGETED.

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. It has been argued that insurance could incentivise policyholders to take natural disaster risk mitigation measures. On the other hand, insurance could result in a moral hazard effect when insured individuals engage in less risk reduction activities. Few studies have empirically examined the relationship between natural disaster insurance coverage and risk mitigation activities of individuals. An ENHANCE study examined how the implementation of a variety of household level flood risk mitigation measures differs between individuals with, and without, flood insurance coverage in Germany. The results show that individuals with flood insurance coverage in Germany



are significantly more likely to have employed mobile flood barriers that keep flood water out of their home than those without insurance. Other risk reducing measures were often implemented by insured and non-insured individuals equally. These findings suggest that the moral hazard effect of insurance coverage is largely absent since households with flood insurance prepare more for floods.

Another ENHANCE study examined whether financial incentives offered by risk based pricing of insurance in Germany and France can stimulate policyholder adaptation to flood risk. This risk based pricing implies that households receive a premium discount when they take measures that reduce flood risk. The effectiveness of such incentives was analysed using an integrated model of household level mitigation behaviour and insurance premiums. The results indicate that insurance based incentives are able to promote adaptation. The incentives could reduce residential flood risk by 12% in Germany and 24% in France by 2040. However, a drawback of risk based pricing is that flood insurance becomes potentially unaffordable for households who face a high risk. The study shows that such concerns for affordability could be overcome by providing vouchers that help low-income households pay for flood insurance coverage.



3 STAKEHOLDER ENGAGEMENT IS IMPORTANT IN ORDER TO DISCOVER CURRENT BARRIERS, PERCEIVED OR OTHERWISE, THAT ARE INHIBITING INNOVATIVE SOLUTIONS OR THE DEVELOPMENT OF NEW PARTNERSHIPS.

Despite broad agreement for closer collaboration between public and private actors in response to rising risk levels many challenges remain for translating this into innovative solutions. Public-Private Partnerships (PPP) in disaster insurance can serve as role models for a joint bearing of responsibilities and efficient risk-sharing. Johansen summarised the principles and preconditions of successful PPPs as (i) being shaped through constructive dialogues (between public and private entities) and conscious of mutual principles and limitations, (ii) safeguarding competitive environment; and (iii) respecting, if not exploiting, risk-differentiated prices as incentive and reward for individual or collective risk prevention and protection. Ideally, private insurers (should) 'have the opportunity to carry on using their savoir-faire in an environment of mutual understanding'. All case studies exemplify that public and private stakeholders have very different constellations and problem definitions. Therefore, stakeholder engagement is important to discover current barriers, perceived or otherwise, which may be inhibiting innovative solutions or the development of new partnerships. For example, it may be that the level of risk itself is seen as already too high for the private sector to engage, or the stakeholders may not have a suitable platform upon which to engage.

4 FLOOD INSURANCE AND DRR NEED TO BE CLOSELY LINKED AND INTEGRATED IN A MULTI-STAKEHOLDER APPROACH.

The discourse about disaster insurance in Europe highlights the key challenges of managing current risks and preparing for future climate risks: at the core lies the issue of collective versus individual responsibility, and solidarity versus market-based approaches. This is where the biggest potential for EU-led action lies – in the facilitation of DRR and adaptation, which will determine risk levels and viability of insurance going forward. However, the design and operation of insurance can also play a role in this. As ENHANCE examples show,



there are significant barriers facing public and private stakeholders. This requires policy action—at EU and national, even regional level. The key question therefore is how to determine and define the roles of industry and policy-makers, recognising that this is likely to differ from country to country. This is an area where closer collaboration between academia, industry and government is needed to proceed.

ENHANCE shows that socio-economic development and climate change can substantially increase pressure on risk transfer or financing mechanisms, like insurance, unless more risk reducing measures are applied, such as flood defences, stricter building codes and/or land use (zoning) policies. Improved risk assessment and data sharing amongst stakeholders are essential for developing those forward-looking solutions in an integrated way. National, local and household level DRR activities could be used as a mechanism for reducing the pressure placed on risk transfer schemes in response to increasing stress. In other words, risk reduction efforts are essential in maintaining the insurability of these risks, especially in the context of flooding and other extreme weather events. Effective adaptation may actually become a condition for granting insurance cover in the future. However, ENHANCE suggests that until today efforts to reform disaster compensation mechanisms in Europe have been predominantly focused on dealing with the financial losses, without considering the implications of these mechanisms for managing and reducing the underlying risks. Reflecting on evidence emerging from other European and international flood insurance schemes, we notice that this is not an exception, but rather the norm. For incentives to be successful, they need to target those who can take action. In the case of insurance this can mean that more stakeholders need to be included in the development of new solutions – for example property developers, mortgage providers and local planning officials, who all determine if, where and how houses are being build, refurbished or repaired.

THIS POLICY BRIEF IS BASED ON RESEARCH OF THE ENHANCE PROJECT:

Botzen, W., Mechler, R., Aerts, J., Hochrainer-Stigler, S., Timonina, A., Lorant, A., Veldkamp, T., Hudson, P., Jenkins, K., Mysiak, J., Surminski, S., Monteagudo, D. (2015). ENHANCE policy brief: natural hazard risk assessments for improving resilience in Europe. Available at: <http://enhanceproject.eu/uploads/biblio/document/file/69/EnhancePolicybriefv04.pdf>

Hudson, P., Botzen, W.J.W., Czajkowski, J., Kreibich, H. (2014). Risk selection and moral hazard in natural disaster insurance markets: empirical evidence from Germany and the United States. Wharton School Working Paper # 2014-07. Available at: <http://opim.wharton.upenn.edu/risk/library/WP201407-Risk-Selection-in-Natural-Disaster-Insurance-Markets.pdf>

Jongman, B., Hochrainer-Stigler, S., Feyen, L., Aerts, J.C.J.H., Mechler, R., Botzen, W.J.W., Bouwer, L.M., Pflug, G., Rojas, R., Ward, P. (2014). Stress on disaster finance due to correlated flood extremes. *Nature Climate Change*, 4, pp. 264-268.

Surminski, S. and Eldridge J. (2015). Flood insurance in England—An assessment of the current and newly proposed insurance scheme in the context of rising flood risk, *Journal of Flood Risk Management*, in press.

Surminski, S., Hudson, P., Aerts, J., Botzen, W., Conceição Colaço, M., Crick, F., Eldridge, J., Lorant, A., Macedo, A., Mechler, R., Mysiak, J., Neto, C., Nicolai, R., Pérez-Blanco, D. and Reg, F. (2015a). Novel and improved insurance instruments for risk reduction. Centre for Climate Change Economics and Policy Working Paper No. 213 Grantham Research Institute on Climate Change and the Environment Working Paper No. 188. Available at: <http://www.cceep.ac.uk/Publications/Working-papers/Papers/210-219/WP-213---Surminski-et-al.pdf>

Surminski, S., Aerts, J.C.J.H., Botzen, W. J. W., Hudson, P., Mysiak, J. and Pérez-Blanco, C. D. (2015b). Reflections on the current debate on how to link flood insurance and disaster risk reduction in the European Union. *Natural Hazards*, 79(3), pp. 1451-1479.