"NAture Insurance value: Assessment and Demonstration"

NAIAD

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EXECUTIVE SUMMARY/

This is the first in a series of policy briefs that will explore the relevance of the insurance value of ecosystems, drawing upon the results and insights of The EU Horizon 2020 project 'NAIAD'- Nature Insurance Value – Assessment and Demonstration. Activities performed in nine demonstration sites (DEMOs) within the NAIAD project have enabled an initial analysis of barriers to realise the potential of Nature Based Solutions (NBS) as a risk reduction strategy. The NAIAD project is further exploring the potential to nudge new approaches in the insurance industry to incentivize the uptake of risk mitigation measures through NBS.

Based on this learning, this brief looks at three priority issues: (1) assessing the potential for NBS to reduce risk; (2) resolving funding gaps and financing frameworks to enable investment in NBS for risk reduction; and (3) integrating insurance systems within risk reduction strategies. It comes to two overriding conclusions. First, NBS can contribute significantly to disaster risk reduction, but unlocking this potential on a greater scale requires improved capacity in many places to assess this risk reduction potential. This in turn necessitates the development of new methods and a stronger evidence base of demonstration sites to validate them to enable broader application. Second, the insurance sector has an opportunity to play a more active role to enable public and private investment in disaster resilience. Efforts are needed to more effectively leverage the insurance sector in disaster risk reduction as risk management experts, institutional investors, standard setters in infrastructure development, as well as stakeholders in the development of new climate-based insurance products.

Edition information

Tableau 1: Versions

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7	26/01/2018	DRAFT FINAL	JOHN JOYCE	
8	29/01/2018	MINOR REVISIONS	ROXANE MARCHAL	
9	30/01/2018	MINOR REVISIONS	NINA GRAVELINE	
10	31/01/2018	MI NOR REVISIONS	JEAN-MARC TACNET	
11	31/01/2018	FEEDBACK	DAVID MONCOULON	
12	02/02/2018	FINAL REVISION	ELENA LOPEZ GUNN	
13	06/02/2018	FINAL DRAFT	JOHN JOYCE/JOSH WEINBERG	
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Key messages

1. **Increasing flooding and droughts, caused in part by climate change, will necessitate greater investment in ex-ante risk reduction measures in Europe and worldwide to minimize exposure and maintain viable insurance markets.** *In depth financial and technical understanding of potential shifts in hazard risk levels are required to ensure that insurance systems can cope with increasing climate uncertainty. Increasing risk levels can lead to insurance systems becoming unaffordable (if the underlying risk and exposure is very high and insurance policy is 'accurately' priced to account for this, leaving many uncovered); or insolvable (if the underlying risk and exposure is very high but insurance policy does not account properly for risk and is unable for damages post disaster).*

2. **The insurance sector must play a more active role to enable public and private investment in disaster resilience, and this will requires new innovations, learning and partnerships.** *The insurance sector can contribute to more resilient societies by expanding upon its traditional role of risk assessment and ex-post disaster compensation to more actively support investment and uptake of ex-ante risk prevention measures (as well as the prevention of risk increasing ventures). The sector is well placed to support this shift as:*
    - *Institutional investors – through the bonds markets, buying green/climate bonds that meet certain regulated standards;*
    - *Insurance providers – through raising the resilience in design, risk management procedures for new or existing infrastructure and through raising the minimum requirements to "insure" and create incentives in the infrastructure sector;*
    - *Stakeholders in the development of new climate-based insurance products; and*
    - *Partners in public-private alliances bringing their risk management expertise.*

3. **NBS can contribute significantly to disaster risk reduction, but unlocking this potential on a greater scale requires improved capacity to assess this risk reduction potential through new methods and a stronger evidence base of demonstration sites to validate them**. *NAIAD is exploring the potential to nudge new approaches in the insurance industry to incentivize the uptake of NBS as ex-ante risk mitigation measures. If NBS are to be effectively deployed to mitigate risk, there are several areas where validation through demonstration projects are still required. These range from understanding the perception of the reliability and effectiveness of a given NBS to resolving information gaps between stakeholders and structuring reporting of NBS to use standardized metrics. Better understanding on the use of a range of valuation techniques and learning from experiences on where and how public policy intervention can support investment and implementation of NBS are also needed.*

Introduction

This is the first in a series of policy briefs that will explore the relevance of the insurance value of ecosystems, drawing upon the results and insights of the EU Horizon 2020 project 'NAIAD'- Nature Insurance Value – Assessment and Demonstration. NAIAD is an advanced, first of a kind, applied research programme focused on Nature Based Solutions (NBS) in risk management strategies, with a focus on water. NAIAD broadly supports the European Commission in its wider ambition to explore integration of NBS into conventional accounting for private or public risk that incorporates the approaches and knowledge from the insurance sector. Framed in line with the Sendai Framework for Disaster Risk Reduction 2015-2030 (Sendai Framework), the Paris Agreement and the implementation of the Agenda 2030, NAIAD´s aims to support greater and more effective investment in ex-ante risk prevention that will reduce costs incurred by societies from water hazards.

NBS can mitigate the impact of a potential hazard. This reduces expected damage costs to people and property, which can include both insured and uninsured assets, as well as wider impacts (e.g. business interruption, etc.) which are often not accounted for in damage costs assessments. This potential avoided cost, or mitigated risk level, is considered to have an 'insurance value'. NAIAD investigates methods to incentivise innovations in current insurance industry business models to take advantage of this potential 'insurance value' added through an NBS. Activities performed in nine demonstration sites (DEMOs) at three different scales (macro, meso and micro) within the NAIAD project have enabled the analysis of barriers to realise the potential of NBS as a risk reduction strategy in real cases. The large scale demos cover the Upper Thames (UK), Lower Danube (Rumania) and Medina aquifer (Spain). The Meso level demos cover the Lez (with Montpellier) and Brague catchments (with Nice) in Southern France and the Glinscica catchment, and Ljubljana in Slovenia. Finally the micro level focus on cities like Copenhagen (Denmark), Lodz (Poland) and Rotterdam (Holland). Drawing upon this experience, this brief looks into three priority issues: (1) assessment of the risk reduction potential of NBS; (2) addressing funding gaps and financing frameworks that enable investment in NBS; and (3) integrating insurance systems in risk reduction strategies that can include NBS.

Issue 1. Assessing the potential for Nature Based Solutions to reduce risks

Risks are pervasive in society. Every sector, assets, systems, are at risk to different hazards and different degrees of risk. NAIAD focuses on water related risks: droughts and floods. These natural disasters include cascading effects generated by interconnected risks. Risks levels depend on (and are a product of) the exposure (location), the vulnerability and the hazard, characterized by strength and frequency. In addition, population and the value of goods and services are important for damage functions. There are direct (immediate physical damages to capital) and indirect damages (economic losses such as business interruption due e.g. to roads closure) in the economy and society, with different sectors affected: businesses, infrastructure, cities, agricultural areas, financial sector and the environment (ecosystems, flora and fauna).

Damages can be avoided by taking risk mitigation actions at different levels. The distinction between structural (infrastructure) and non-structural (preventive information, land-use management…) measures is often applied.

Understanding and characterizing the effects of hazards on exposed assets and populations are the very first step of risk assessment: these are the basis for any protection effectiveness assessment (including NBS). For example, NBS for flood management could be flood expansion zones or buffers also known as natural flood management or natural water retention measures. If NBS are to play a role as effective and efficient risk management options, there are several areas where they must be validated through demonstration. NAIAD demonstration projects are analysing several of these issues, including:

- understanding the perception of the reliability and effectiveness of NBS;
- structuring the reporting of NBS to use standardised metrics;
- the use of a range of valuation techniques,
- addressing information gaps between stakeholders and,
- highlighting where public policy intervention could act as enabler or leverage for action.

Life Cycle Cost Analysis for NBS: Advancing the State of the Art

Life Cycle Cost (LCO) analysis is a technique that can be useful. It enables assessment of total cost of ownership for multiple options (such as business as usual, green, grey and hybrid) accounting for differences in each for the entire lifecycle of their production, use and maintenance. LCO can serve as a guideline for a specific site to calculate in a standardized way the costs of the alternative NBS and disaster risk reduction measures considered for implementation in exposed sites. The 'Costing Nature' tool specifically calculates the environmental potential for hazards and the human socio-economic exposure to these hazards combined with a measure of vulnerability to hazards to calculate risks, where risks are the product of hazard exposure and vulnerability. This is complemented by advanced monetary and non-monetary benefits and co-benefits analysis, including willingness to pay and willingness to accept as foundational steps to derive a strong evidence-base at DEMO level. Monetary and non-monetary values of NBS and ecosystem services based on their disaster risk management contributions could be a decisive factor to help the adoption in the market place and integration to disaster risk management (DRM) and climate change adaptation planning.

Addressing Ambiguity

Ambiguity in risk perception can be a potential barrier to actual implementation of NBS risk management strategies. NAIAD is testing the hypothesis that, if decision makers are aware of the existence of ambiguity, these decision makers are more likely to have creative and collaborative decision-making processes. Risk acceptability is cultural, such as a prevention culture, a risk culture, which are directly linked to the level of risk awareness (of population, politicians, public sector…). This role of culture and risk awareness is therefore both a public policy issue and an insurance industry concern since the social acceptability of measures is central to their adoption and/or for the demand for new NBS based solutions.

Issue 2: Filling Funding Gaps and Fixing Financing Frameworks

The successful design of an NBS clearly depends upon in depth financial and technical understanding of climate change, hazards, and risk levels. The feasibility of investment and implementation is determined by appropriate business models and aligned financing strategies. It is useful to separate funding and financing challenges that will either enable or impede NBS from moving forward. The funding challenge is about ensuring agreement on how CAPEX (capital expenses) and OPEX (operative expenses, such as operation and maintenance) of NBS are going to be funded, e.g. by taxes, tariffs or transfers. The financing challenge is about how to structure bankable NBS projects, where the project developer (public or private) can make the financial business case to show that the risk and cash profile, and the institutional set up of the project are sound enough to guarantee payback to the financing institutions. Liability and contractual issues are important aspects to also consider.

New business models aim primarily to solve the funding gap for the implementation of NBS risk mitigation and climate adaptation measures, by creating additional revenue streams. Often these business models aim to capitalize and convert earmarked money flows to invest in the risk reduction potential of an NBS. In institutional terms this will require an incentive alignment between who carries the costs currently versus who benefits from risk management measures. However, these forms of public funds will not be enough to cover the adaptation investment required globally. The private sector is expected to cover most of the required investments, with some estimating this will need to account for as much as 85 to 90% of total financing. This means diverse financial options should be explored for NBS adoption. Actions needed include investigating the opportunity to use green bonds and criteria requirements; developing new funds for NBS or enabling current DRR funds to finance NBS more readily. Financial mechanisms should also be compatible with risk sharing principles.

The challenge is therefore how to leverage – through scarce public funds - private capital and private sector participation in the implementation of NBS. Private, or public-private investors, must be comfortable with the performance risks of NBS versus grey options. This would help both to develop NBS projects and to request financing for their implementation. However, matching the financing streams with the NBS requirements, the capital investment, maintenance and operation needs with private capital sources all need to be sorted. In addition, financiers need to trust the financial analysis, including cost and benefits analysis, of project sponsors (public or private). Therefore, dialogue and engagement of the insurance sector, is a key part of this equation as this dialogue can support evaluation of the value of hazard mitigation provided by an NBS, which in turn can validate these type of NBS investments.

Issue 3. Integrating insurance in risk reduction strategies that include NBS

Insurance models are very diverse in Europe and worldwide. There are two types of models, and in between a range of options: in one side (solidarity based) everybody contributes with small amounts to be covered from every type of hazard, independently of the exposure to hazards; on the other side, actors (individualised and voluntary) opt to pay premiums for specific hazards, where these premium vary by exposure.

The insurance sector is already developing incentive mechanisms to reduce risk by promoting risk awareness and ex-ante risk mitigation measures. In these cases, if a policy-holder significantly invests in reducing risk e.g. in NBS, the value of this investment may affect their insurance policy cost. Individuals or groups that invest in risk mitigation measures to reduce their exposure to risk, can be offered a reduced premium versus those that do not invest.[1] Here NAIAD is exploring the potential for new approaches in the insurance industry to incentivize the uptake of NBS as ex-ante risk mitigation measures. The insurance sector is currently in the process of looking at ways[2] to apply risk-based premiums where the insurance value of ecosystems could offer additional opportunities. Local knowledge and context is critical to evaluate suitable options. Issues to consider that can impact the support for and uptake of an NBS include: the impact of culture; the level of risk awareness and knowledge on the acceptability of risk (of the local population and government agencies, etc.); and the local demand for protection.

Beyond the potential influence achieved through risk-based premiums, the insurance sector is well placed to support much broader action to reduce risk and increase resilience to disaster. It can do this in, at minimum, four ways:

- First, as Institutional investors – through the bonds markets, buying green/climate bonds that meet certain regulated standards;
- Second, as Insurance providers – raising the resilience in design, risk management procedures for new or existing infrastructure and through raising the minimum requirements to “insure”, that create powerful incentives in the infrastructure sector;
- Third, as co-developers of new climate-based insurance products; and
- Fourth, as Partners in public-private alliance bringing their risk management expertise.

The insurance sector has an opportunity to play an active role to enable public and private investment in disaster resilience, through engaged dialogues, extensive and deep cross-learning and the formation of new partnerships between a wider set of stakeholders.

[1] Currently, it is the US case with the National Flood Insurance Program (NFIP). In the EU, European insurance industry is starting to implement this kind of incentives (notably in countries with risk-based premiums, such as the UK and Germany).
[2] As acknowledged during the 2017 OECD Green Finance Forum.

About the NAIAD Project

'NAIAD' (Nature Insurance Value – Assessment and Demonstration) is an advanced, first of a kind, EU Horizon 2020 applied research programme focused on Nature Based Solutions (NBS) in risk management strategies, with a focus on water. NAIAD aims to operationalize the insurance value of ecosystems to reduce the human and economic cost of risks associated with water (floods and drought) by developing and testing - with key insurers and municipalities - the concepts, tools, applications and instruments (business models) necessary for its mainstreaming.