ClimateWise
Insuring a sustainable future

Why nature matters:
Nature-related risks and opportunities for insurance underwriting

UNIVERSITY OF CAMBRIDGE
INSTITUTE FOR SUSTAINABILITY LEADERSHIP

NATURE POSITIVE

The University of Cambridge Institute for Sustainability Leadership

The University of Cambridge Institute for Sustainability Leadership partners with business and governments to develop leadership and solutions for a sustainable economy. We aim to achieve net zero, protect and restore nature, and build inclusive and resilient societies. For over three decades we have built the leadership capacity and capabilities of individuals and organisations, and created industry-leading collaborations, to catalyse change and accelerate the path to a sustainable economy. Our interdisciplinary research engagement builds the evidence base for practical action.

ClimateWise

ClimateWise supports the insurance industry to better communicate, disclose and respond to the risks and opportunities associated with the climate-risk protection gap, and aligns its members' expertise to directly support society as it responds to the risks and opportunities of climate change.

Authors and acknowledgements

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Executive summary

According to a recent global survey of the insurance industry, half of the re/insurers surveyed believe that nature-related risks are material for their underwriting business[i]. Despite this perceived materiality, nature-related risks are not currently being assessed in underwriting by the majority of re/insurance industry participants due to a lack of awareness and understanding of nature-related risks; data and information; regulatory and supervisory guidance; technical capacity and skills; and mandate/buy-in from Executive Management[ii].

Although a growing number of re/insurers are publicly committing to fostering a nature-positive economy, action to date has primarily been focused on investment activities and not underwriting. Compared to other financial institutions, re/insurers may be uniquely motivated to support nature-positive activities as such activities have the potential to reduce physical, transition and liability risks to businesses, which in turn may lower the incidence and severity of insurance claims[iii i]. Besides contributing to the protection and restoration of the natural world, this would result in a more robust industry that takes nature into account in decision-making processes.

This paper summarises key concepts and introduces principles for a framework for identifying and assessing nature-related risks in the re/insurance industry. It also discusses four different approaches that insurers can adopt to reduce the impact on nature or contribute to its protection and restoration[iv iii v]:

1. Incentivising nature-positive behaviours with clients and customers;
2. Innovating in asset protection;
3. Facilitating capital flows; and
4. Collaborating with governments.

Building a nature-positive insurance industry could result in the following:

- the development of new re/insurance products and services to inform and support nature-related risk management;
- the development of new markets and innovative financial products in partnership with wider financial services;
- the development of guidance for public and private adaptation investment in nature-positive measures that consider the long-term benefits of a resilient society, business and economy; and
- the ongoing sustainability of the insurance business model based on risk pooling and risk diversification for insurers, as well as potentially more affordable premiums or continued capacity for nature-positive clients.

The insurance industry has the opportunity to revisit and redefine its role in society to support risk management through proactive nature-positive activities, rather than simply responding to claims following a disaster or loss. In coming workshops and research, ClimateWise will develop a high-level roadmap with its members, practitioners and academics. The roadmap will set out an actionable pathway to integrate nature-related risks and opportunities into re/insurance underwriting, with the aim that this pathway will also complement net-zero underwriting commitments.

Introduction

Why is nature important?

It is now recognised that humanity is threatening the stability of the Earth system, which has enabled the development of modern societies over the past 10,000 years[ii] [vi]. According to the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES), human activity has "significantly altered" 75 per cent of the land surface and about 66 per cent of the marine environment[vii]. The current global rate of decline in nature is unprecedented in human history, and this vast deterioration of oceans, rivers, forests and other ecosystems is eroding the very foundations of our economies and society[viii].

Nature is composed of four realms – Land, Ocean, Freshwater and Atmosphere – where environmental assets generate "flows of benefits" to society and the economy[ix]. These so-called "ecosystem services" include (i) **provisioning services,** such as the provision of food, fresh water, genetic resources, medicinal resources, energy and raw materials; (ii) **maintenance and regulating services,** that is, the regulation of climate, the purification of water and air, pollination and biological pest and disease control; (iii) **cultural services,** including contributions to physical and mental health, as well as enabling recreational and spiritual experiences; and (iv) **supporting services,** such as nutrient cycling and soil formation which underpins all the other ecosystem services. These benefits, provided by ecosystem services, are absolutely relevant to the existence of human society and the global economy[ii].

Within the financial sector, there is an increasing awareness of the economic risks posed by nature loss[x]. In the last World Economic Forum's Global Risks Perception Survey, the top three risks by severity were climate action failure, extreme weather events, as well as biodiversity loss and ecosystem collapse[xi]. There is also a growing recognition that there are complex interconnections between climate change and nature loss, meaning that a systemic approach is needed to understand their social and economic implications[ii].

Nature-related risks in the insurance sector

According to a recent global survey of the insurance industry, half of the re/insurers surveyed believed that nature-related risks are material for their underwriting business[i]. Notwithstanding this perceived materiality, the majority of insurance industry participants still do not assess nature-related risks. There are a number of barriers to assessing nature-related risks in underwriting. These include a lack of awareness and understanding of nature-related risks and opportunities; data and information; regulatory and supervisory guidance and / or requirements; technical capacity and skills; as well as mandate and buy-in from Executive Management[ii]. Nature-related risks are also challenging to measure as there are multiple interrelations between nature, society and the global economy that amplify uncertainties[iv].

Despite the difficulties of modelling ecological interactions, the current state of scientific knowledge already gives us certainty about the increasing risks posed by nature loss to our societies and the financial sector, including to the re/insurance industry[iv].

Nature losses and attempts to respond to them can be related to three different categories of financial risks: physical, transition and liability[xii].

Physical risks occur when environmental assets are damaged, disrupting the capacity of nature to provide ecosystem services, either temporarily or permanently. This affects policyholders and investees of re/insurance companies, transmitting financial risks to the re/insurance industry. For example, unexpected increases in insurance claims could occur due to business interruptions resulting from exacerbated natural disasters, limited water availability or nutrient cycling, land degradation and climate change[iv ii i].

Transition risks include those risks that arise from policy, regulatory, economic and market changes in the transition to a nature-positive future[ii]. Certain economic sectors, for example, can be particularly affected by changes in consumer preferences, new regulatory standards, and global targets to increase conservation areas or limit deforestation[i]. World leaders have recently made new commitments, specifically focused on the protection and restoration of nature, such as the Nature Compact launched by G7 leaders, and the Kunming Declaration agreed by over 100 countries at the first part of the ongoing 15th meeting of the Conference of the Parties (COP15) to the United Nations Convention on Biological Diversity (CBD)[xiii xiv]. The Post-2020 Global Biodiversity Framework, to be adopted later in 2022, will set the tone for policies and regulations at regional and national levels, with direct implications for businesses and the financial sector[ii]. A concrete new regional example is the new EU proposal for a Nature Restoration Law, which will set restoration targets and obligations across a broad range of ecosystems at land and sea for EU Member States, in a move that could substantially change the landscape on the EU's nature policy.

Finally, businesses, including insurers and their clients, may also be vulnerable to nature-related litigation, through which claimants seek to hold individual companies to account for their perceived role in causing or perpetuating nature-related harm[i]. Businesses are also vulnerable to 'greenwashing' claims – alleging that they have overstated their positive environmental credentials or even underreported the impact that their business has on the environment and nature more broadly.

These physical, transition and liability risks could result in financial risk for insurers through the products that insurers offer to mitigate the loss to businesses[i]:

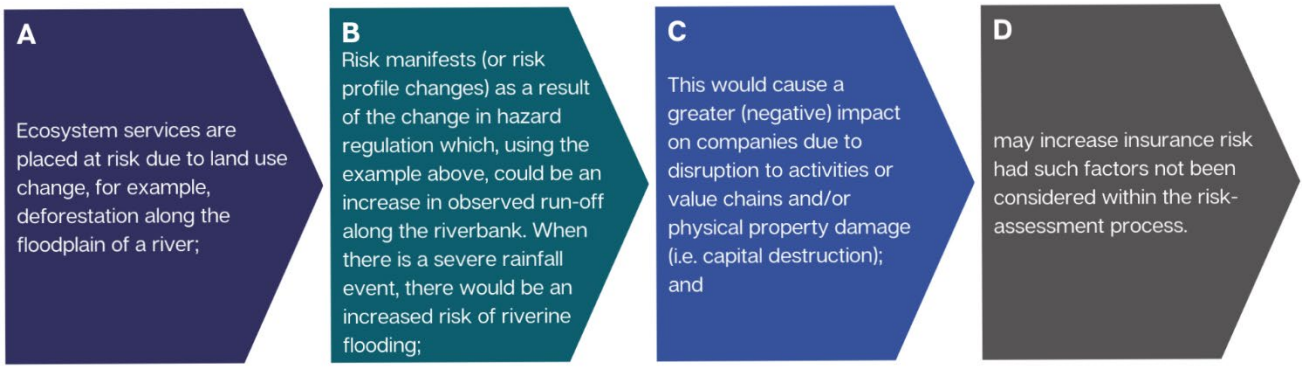
- **Insurance risks** relate to losses resulting from the mispricing of insurance products. Given the challenges to model nature-related loss, unexpected increases in frequency, severity and geographic concentration of claims could threaten underwriting profitability[i].
- **Credit risks** result from losing the credit quality of fixed income holdings[i].
- **Market risks** include the risk of losses in on- and off-balance-sheet positions arising from price fluctuations[xv].
- **Liquidity risks** can involve short-term cash shortfalls or even challenges in obtaining refinancing due to a combination of other financial risks[iv].
- **Business risks** are those that an insurer's operations, plans or business model face due to a change in circumstances[xii]. They include reputational risks, litigation risks, and regulatory risks due to evolving regulations for the insurance industry, which may also increase compliance costs [iv i].

Figure 1: Framework for identifying nature-related financial risks[xii]

The framework, presented in Figure 1, can be a useful tool for insurers to identify and assess nature-related risks, integrating them into financial decision making. It was co-created by banks, asset managers, CISL's Centre for Sustainable Finance and academics from the University of Cambridge conservation cluster. The framework was built on the Dasgupta Review of the economics of biodiversity[xvi], enabling

financial institutions to begin embedding nature into mainstream financial models, risk frameworks and portfolio strategies. This paper has been adapted to include insurance risks.

An example of how the framework could be applied in the context of re/insurance could be:



Second-order effects and financial stability

In addition to these risks that are directly transmitted to re/insurers, it is now recognised that nature-related loss could also propel second-order effects and even threaten the broader stability of the financial system[xii ii]. Furthermore, the scale of nature-related losses impacts is likely to increasingly happen simultaneously rather than occurring as isolated risks. Physical risks could result in a growing number of claims, initially focused on specific geographies and sectors, but eventually becoming widespread. In worst case scenarios, this increased demand for payments could pose liquidity risks for affected insurers that might need to sell assets at a loss, limit or withdraw coverage from existing assets, or raise premiums. Insurance products might become less attractive and unaffordable, affecting the diversity and size of the insurance risk pool, as well as the broader economy and prompting a surge of self-reinforcing business failures, with potential fiscal implications[i].

Nature and financial regulation

Efforts to develop and test metrics for disclosure of nature-related financial risks are underway, including the recommendations of the Taskforce on Nature-related Financial Disclosures (TNFD) and the draft Sustainability Disclosure Standards by the International Sustainability Standards Board (ISSB)[ii i]. Disclosure of nature-related financial information is also beginning to be included in regulation. In France, for example, mandatory reporting related to dependencies on and impacts on biodiversity is present in the scope of Article 29 of the 2019 Energy & Climate Act. Furthermore, from 2023 and pursuant to the EU Taxonomy, the disclosure of alignment with six environmental objectives, including protecting and restoring biodiversity and ecosystems, will be required[ii].

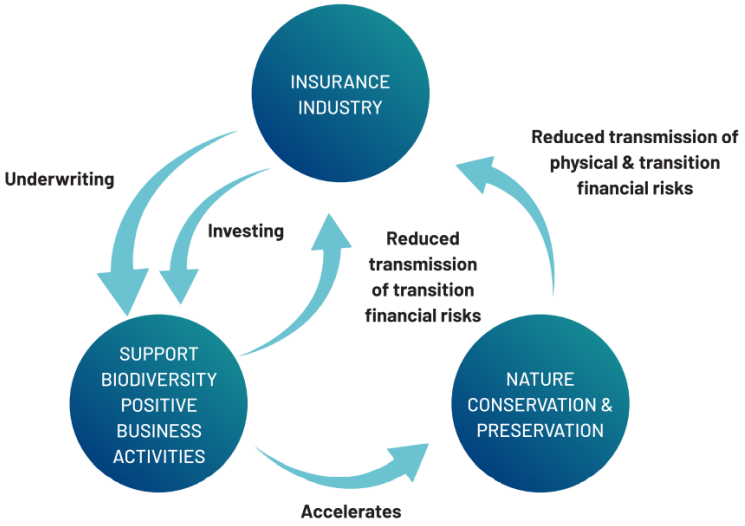
Besides greater disclosure, other potential actions are being discussed by regulators to mitigate nature-related risks, such as changes to risk-based capital requirements and active engagement with re/insurers on how nature is being integrated into their underwriting activities. The EU, in particular, is considering how to improve the financial sector's resilience to sustainability risks. Key areas to examine will include Solvency II and the Insurance Distribution Directive, which aims to ensure the integration of sustainability factors and risks in re/insurance undertaking's management, products and services[iii ii].

Nature-positive insurance

Further to regulation, a growing number of re/insurers are publicly committing to fostering a nature-positive economy. One in which "businesses, governments and others take action at scale to minimise and remove the drivers and pressures fuelling the degradation of nature, to actively improve the state of nature itself and to boost nature's contribution to society"[xvii].

Similar to other financial institutions, re/insurers have an additional, commercial motivation to support nature-positive activities. These can reduce physical, transition and liability risks to insured companies, and thus reduce financial risks that might otherwise be borne by the insurance industry (refer to Figure 2 for a diagram of the interaction)[iii i].

Figure 2: Feedback loops from investing in nature [iii]



There are at least four different approaches that insurers can adopt to reduce the impact on nature or contribute to its restoration[iv iii v]:

1. Incentivizing nature-positive behaviours with clients and customers;
2. Innovating in asset protection;
3. Facilitating capital flows; and
4. Collaborating with governments

1. Incentivizing nature-positive behaviours with clients and customers

Insurers can encourage preventative actions through many levers, for example, by providing information to clients on how to avert damage, reducing premiums when specific measures are in place or by setting specific conditions on insurance agreements related to the payment of claims[iv v]. They can also influence the economy through investment and facilitation decisions on how they allocate their capital, either by excluding harmful activities to the environment or by actively supporting nature-positive ones[viii iii]). Insurers can also incentivise clients by earmarking additional capacity for clients with strong ESG credentials.

Thereby the insurance industry can encourage nature-based solutions (NbS)[xviii], being "ways of working with natural systems to both strengthen them while solving broader problems such as climate change but also health, social inclusion, and more"[xix]. For example, a recent study by The Nature Conservancy and WTW showed that ecological forestry techniques could reduce residential insurance premiums by 41 per cent in wildfire risk areas in northern Sierra Nevada. Another study from the Insurance Bureau of Canada found that natural assets can meaningfully reduce flood damages to downstream communities, helping reduce property losses[xx]. Policies could be proposed for 'community-based insurance' where local government purchase home insurance and homeowners contribute a proportionate fee for coverage. Then the premium savings could be used to issue wildfire resilience bonds to fund or finance ecological forestry[i].

Earlier this year, CISL launched a tool to advance organisational understanding of nature-based solutions projects and accelerate their adoption and implementation within companies[xxi]. Pilot schemes for NbS have also been undertaken by CISL, providing a guide for organisations looking for ways to mitigate risks from the degradation of natural resources[xxii]. There are certainly opportunities for research and innovation on this matter, given the wide knowledge gap in the industry about modelling the effects of NbS on hazard reduction[v]. Data access will be essential for clients to take a longer-term view of their insurance procurement process. By modelling the environmental changes and potential damage caused by physical hazards near their business operations, clients can better decide on the insurer they select to work with and the coverage they purchase in the longer term. This will have the added benefit of encouraging nature positive practices and open them up to exploring non-traditional insurance products such as parametric solutions.

2. Innovating in asset protection

Another avenue for encouraging nature-positive practices is insuring natural infrastructure, such as mangroves or coral reefs, based on the value provided by these ecosystems, both in terms of risk reduction[xxiii] and as a tourist attraction. In coastal Mexico tourism businesses, property owners and local municipalities partnered to purchase parametric catastrophe insurance that protects 160 km of coral reef against damages from storms. Coral reef insurance programmes have also been implemented along the Mesoamerican Reef, covering specific sites offshore of Mexico, Belize, Guatemala, and Honduras. In case of storms with wind speeds exceeding specific benchmarks, insurance pay-outs are released to fund reef recovery and restoration activities by specialist "reef brigades", which have been shown to minimise storm damage and enhance reef recovery (for example, by clearing debris or reattaching coral fragments). Apart

from the benefits to the ecosystems themselves, ensuring the conservation of healthy reef systems is also a cost-effective approach. It has been estimated that the cost of these repairs (between US$50,000–150,000) is considerably lower than artificial measures, such as building a seawall, which could also protect the shoreline against waves, but would cost about US$1 million per half mile[v i]. However, to fully protect coral reefs, other financial instruments such as blue bonds should also be investigated, which could address the chronic impacts of climate change on rising sea temperatures[iii].

3. Facilitating capital inflow

Insurers can also act to attract investments for nature-positive activities by issuing catastrophe bonds or underwriting innovative instruments. In December 2021, for example, Belize issued a blue bond combined with a parametric insurance policy, a non-traditional insurance product that offers pre-specified payouts based on trigger events, as part of the country's 20-year sovereign debt structuring. The transaction proceeds will be used for marine conservation, while the "catastrophe wrapper" provides insurance protection for the country's loan repayments after hurricane events. With the insurance pay-out servicing creditors, the loan terms and duration remain fully intact, enabling the Government to focus on disaster response and recovery while also protecting Belize's credit rating. Additional novel insurance products for nature protection and promotion are to be designed, piloted and scaled[iii]. Aon and CISL explored another example of means to engage with the investment community. A mapping tool was created based on MSCI All World Index to inform fund managers of nature risk and incorporate it into portfolio management[xxiv].

4. Collaborating with governments

Insurers can also use their wider risk management expertise to build capacity and partner with policymakers to encourage better adaptation planning and risk management of nature-related risks, as well as highlight the sector's support for measures to protect and restore nature. This is particularly relevant as nature-related risks can have significant impacts on sovereign creditworthiness, default probability, and the cost of capital. A study by the University of Cambridge found that, across the 26 countries, downgrades due to the collapse of ecosystem services would increase the annual interest payment on debt by up to US$53 billion a year, leaving many developing nations at significant risk of sovereign debt default – in effect, bankruptcy[xxv]. By providing advice and sharing data on historical damages and loss prevention, they could contribute to raising risk awareness and support the development of investment pipelines, including on NbS. For example, use cases developed by CISL in collaboration with investors found that lower water security may lead to heavy users relocating manufacturing assets, affecting the local job market, lowering tax revenues, and increasing sovereign debt risk. Insurers can also encourage disaster prevention by advocating for appropriate governmental policies, such as land-use planning or building codes[v].

Priorities, recommendations and next steps

The insurance and reinsurance industry are uniquely well-placed to help develop societies' understanding of nature-related risks, and foster preparedness for and management of nature-related risks. The industry has an opportunity to share its knowledge as a risk partner and to use its influence and abilities as a provider of contingent capital to encourage nature-positive measures.

Building a nature-positive insurance industry could result in the following:

- the development of new re/insurance products and services to inform and support nature-related risk management;
- the development of new markets and innovative financial products in partnership with wider financial services;
- the development of guidance for public and private adaptation investment in nature-positive measures that consider the long-term benefits of a resilient society, business and economy; and
- the ongoing sustainability of the insurance business model based on risk pooling and risk diversification for insurers, as well as potentially more affordable premiums or continued capacity for nature-positive clients.

The re/insurance industry has an opportunity to revisit and redefine its role in society to support risk management through proactive nature-positive measures and contribute to the protection and restoration of nature, and not simply by reactively responding to claims following a disaster or loss.

Working through a series of workshops and wider research, ClimateWise will develop a high-level roadmap in conjunction with its members, practitioners and academics to set out an actionable pathway to integrate nature-related risks and opportunities into underwriting, with the aim that this pathway will also complement net zero underwriting commitments.

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