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The Importance of Biodiversity Risks

Initial Position Paper

by Jones, A., Allison, R., Bedenham, G., Bharadwa, B.,
Clyde, J., Darsley, A., & Spencer, N.

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Title

Initial position paper on the importance of biodiversity risks

Author/Authors

Jones, A.*, Allison, R., Bedenham, G., Bharadwa, B., Clyde, J., Darsley, A., & Spencer, N.

Abstract

This paper highlights the urgent need for actuaries to take into account the importance, perils and impacts of global biodiversity risks. The Biodiversity and Natural Capital Working Party has been set up to take forward a series of activities including think pieces, webinars and external engagement to ensure our proactive engagement with these risks.

Keywords

Biodiversity; Natural Capital; Monetisation; COVID;

Correspondence details

*Correspondence to: Professor Aled Jones HonFIA, Global Sustainability Institute, Anglia Ruskin University, East Road, Cambridge, CB1 1PT, UK. E-mail: aled.jones@aru.ac.uk

Introduction

Biodiversity is defined by the Convention on Biological Diversity¹ as diversity of species, variation of genes and different ecosystems. There are more than 10 million different species of animals, plants, fungi and microorganisms on earth², and humanity depends on this biodiversity to survive and thrive.

In its Global Risks Report 2020³, the World Economic Forum ranked biodiversity loss and ecosystem collapse as one of its top five global risks in terms of both likelihood and impact. Recent studies have suggested that the mass degradation of natural habitats has led to a significant proportion of original biodiversity being lost worldwide⁴, with global wildlife populations declining by as much as 60% in the last 50 years⁵.

The loss of biodiversity threatens the health of ecosystems that provide services to the economy, including animal pollination of food crops, natural water treatment and fertile soil. The WWF has gone one step further and attempted to quantify the economic impact of biodiversity loss in its Global Futures Report. It suggests that if biodiversity loss continues at its current trajectory it will result in a loss of US\$10 trillion in global GDP between 2011 and 2050⁶.

Looking beyond services to the economy, the loss of biodiversity and healthy ecosystems also contributes to the acceleration of climate change. Deforestation, for example, is responsible for as much as 30% of global greenhouse gas emissions each year⁷ and has the second order effect of reducing future natural carbon capture capabilities.

It is important to also reflect upon how the health of our planet plays an important role in the emergence and spread of infectious diseases. The Dasgupta Review⁸ suggests that biodiversity loss increases contact points between people and wildlife which carry zoonotic pathogens, which ultimately leads to spill-over infections where pathogens are transmitted from animals to human hosts. Our experience with COVID-19 further emphasises the importance of biodiversity for our health and that of the global economy.

One way in which biodiversity could be protected is by measuring its economic value. Nature could be described in terms of “natural capital”, whereby nature is valued based on the natural resources it contains and the environmental services it provides for economic and social well-being. There are however merits and limitations with this approach, and there is no emerging consensus at present as to whether this is the best way to frame the issue.

Biodiversity loss has also been gaining an increasing amount of publicity in mainstream and social media in recent months. Recent examples include coverage of the 2020 UN Biodiversity Summit and communications from influential public figures such as David Attenborough on the issue.

¹ <https://www.cbd.int/>

² <https://www.pwc.ch/en/insights/regulation/nature-is-too-big-to-fail.html>

³ <https://www.weforum.org/reports/the-global-risks-report-2020>

⁴ IPBES (2019): Global assessment report on biodiversity and ecosystem services of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services. E. S. Brondizio, J. Settele, S. Díaz, and H. T. Ngo (editors). IPBES secretariat, Bonn, Germany.

⁵ <https://www.pwc.ch/en/insights/regulation/nature-is-too-big-to-fail.html>

⁶ https://www.wwf.org.uk/sites/default/files/2020-02/Global_Futures_Technical_Report.pdf

⁷ <https://www.cfr.org/backgrounder/deforestation-and-greenhouse-gas-emissions>

⁸

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/882222/The_Economics_of_Biodiversity_The_Dasgupta_Review_Interim_Report.pdf

Case study – Dutch Nitrogen crisis

The Netherlands is currently facing a “stikstofcrisis” (nitrogen crisis). The Netherlands is one of the most highly polluting countries in the EU and needs to cut down its greenhouse gas emissions significantly to align to the goals of the Paris Agreement. One of the key drivers of nitrogen emission rules in the Netherlands is the protection of biodiversity. Nitrogen is contained in fertilizers which are used significantly in a country which is heavily dependent on agriculture, however not all fertilizers are absorbed by the crops and wash into the surrounding areas.

This promotes the growth of plants such as algae which ultimately limits biodiversity. Furthermore, algae bloom affects the quality of surface water used for drinking water production, due to the by-products of dying algae and the loss of self-restoration of the rivers. Disruption to surface water also affects certain factories which use the surface water for their processes (such as power plants for cooling), as well as having a detrimental impact on the food supply of crop pollinators such as bees.

Political and regulatory context

There is a growing recognition amongst governments, policymakers, institutions and society of the risks posed by biodiversity loss. For example:

- The 2021 UN Convention on Biological Diversity (CBD)⁹ is being held in Kunming, China, and sets out to conserve global biological diversity, the sustainable use of its components and the fair and equitable sharing of its benefits.
- The European Green Deal includes a new biodiversity strategy¹⁰, which aims to ensure the European economy functions within planetary boundaries.
- In March 2019, the UK Treasury commissioned The Dasgupta Review, a global review on the economics of biodiversity.
- The CRO Forum, which has members representing some of the largest insurers in the world, identified the following five areas relating to biodiversity in its 2020 Emerging Risk Radar¹¹ as medium risk: Resource scarcity; New frontiers for resource extraction; Environment pollution; Food and water supply; Plastics and microplastics.

⁹ <https://www.un.org/en/observances/biological-diversity-day/convention>

¹⁰ <https://ieep.eu/news/what-the-green-deal-means-for-europe-s-biodiversity>

¹¹ <https://www.thecroforum.org/risk-radar/>

Implications for actuaries' work

The risks associated with destruction of the environment and loss of biodiversity are hard to quantify due to their long-term, uncertain and intangible nature. The management and measurement of these risks is a field where actuaries are well placed to contribute. These risks will also have a material effect on the principal areas of actuarial work and so should be taken into account when we carry out our work.

Material financial risk

Biodiversity loss represents a material financial risk. Its consequences can be classified in a similar way to that commonly used for climate change¹²:

- **Physical risks** – are direct effects on businesses and assets. For example, industries dependant on pollination will be exposed to lower yields and higher production costs. More dramatically, biodiversity loss can worsen the losses caused by natural disasters. The devastating tsunami that hit South East Asia in 2004 led to greater damage to areas with depleted coastal mangrove cover, due to the loss of the natural defence¹³.
- **Transition risks** – are the indirect impacts of a transition to an economy that conserves and restores biodiversity. The political initiatives above show that momentum is building towards stricter regulation, which could make some current business practices more costly or unviable. This also encompasses reputational risks for companies exposed to poor environmental practices, such as the overuse of palm oil, as well as opportunities for companies able to innovate quickly.

Some commentators also cite **litigation risk** (claims for compensation for biodiversity-related losses) and **systemic risk** (to the smooth functioning of the wider financial system) as further categories.

Another viewpoint is that past economic growth has relied on running down natural capital, and therefore measurement of economic growth has been overstated by not taking this impact into account. This implies extrapolating past growth trends into the future may be unreliable.

Overall, we see a material risk that markets may be underestimating biodiversity-related financial risks.

Example: A study on the Dutch financial sector¹⁴ found that, of investments by Dutch financial institutions, a total of EUR 510 billion was highly or very highly dependent on one or more ecosystem services¹⁵. This represented 36% of the portfolio of more than EUR 1,400 billion.

Professional duty

Given the risks highlighted above, actuaries have a professional duty to take account of it in their advice, where relevant and material. Some areas of actuarial work that could be affected include:

- **Insurance** - Increased severity of natural disasters facilitated by the loss of biodiversity leading to an increase in claims across a range of business lines including liability, home and motor. Increased business interruption claims due to supply chain disruption (e.g. crop failures).
- **Pensions** – Weaker covenant for scheme sponsors exposed to biodiversity loss or whose business model relies on natural capital. Asset return models based on past rates of economic growth may be invalid, impacting valuation discount rates
- **Mortality** – Long term mortality trends could be affected, e.g. through increased air pollution, increased possibility of pandemics or a more constrained and less varied food supply.
- **Investment** - Biodiversity loss may result in a reduction in asset value for particular investments and may lead to increased stranded asset risk.

¹² <https://www.bankofengland.co.uk/-/media/boe/files/prudential-regulation/supervisory-statement/2019/ss319>

¹³ WWF/pwc - Nature is too Big to Fail, 2020 https://wwfeu.awsassets.panda.org/downloads/nature_is_too_big_to_fail_en_web.pdf

¹⁴ Indebted to nature – Denederlandschebank, 2020, https://www.dnb.nl/en/binaries/Indebted%20to%20nature%20_tcm47-389172.pdf

¹⁵ <https://biodiversity.europa.eu/topics/ecosystem-services>

While climate change risk is often referred to explicitly in law, biodiversity loss does not yet have this profile. However, institutional investors are required to take account of Environmental, Social and Governance (ESG) issues (for example, the new requirements for a pension scheme's Statement of Investment Principles). Biodiversity loss, as a key environmental risk, would be covered by these requirements.

Public interest

Serving the public interest is a key duty of the actuarial profession, and the issues raised in this paper are clearly relevant to the public interest. A key role actuaries have traditionally played is in ensuring fairness between different groups of stakeholders (e.g. policyholders/shareholders or scheme members/sponsors). These skills make us well placed to inform and influence the public debate on this important topic.

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Institute and Faculty of Actuaries

London

7th Floor · Holborn Gate · 326-330 High Holborn · London · WC1V 7PP
Tel: +44 (0) 20 7632 2100 · Fax: +44 (0) 20 7632 2111

Edinburgh

Level 2 · Exchange Crescent · 7 Conference Square · Edinburgh · EH3 8RA
Tel: +44 (0) 131 240 1300 · Fax +44 (0) 131 240 1311

Oxford

1st Floor · Park Central · 40/41 Park End Street · Oxford · OX1 1JD
Tel: +44 (0) 1865 268 200 · Fax: +44 (0) 1865 268 211

Beijing

6/F · Tower 2 · Prosper Centre · 5 Guanghua Road · Chaoyang District · Beijing · China 1000020
Tel: +86 (10) 8573 1000

Hong Kong

2202 Tower Two · Lippo Centre · 89 Queensway · Hong Kong
Tel: +11 (0) 852 2147 9418 · Fax: +11 (0) 852 2147 2497

Singapore

163 Tras Street · #07-05 Lian Huat Building · Singapore · 079024
Tel: +65 6717 2955

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