

SESSIONAL MEETING DISCUSSION

Biodiversity & nature-related risk policy

[IFoA Biodiversity Working Party, Institute and Faculty of Actuaries, Sessional Webinar, Wednesday 4 October 2023]

Moderator (Mr N. S. Spencer, F.I.A.): Welcome everyone. I am Nick Spencer, a past chair of the Sustainability Board, and I am very pleased to be the chair for this sessional meeting by the Biodiversity Working Party this afternoon.

The biodiversity topic is a really important one for actuaries and was one of my three themes of the Sustainability Board in 2020. The IFoA resources that have been collated are available on a website: <https://actuaries.org.uk/thought-leadership/policy/sustainability-hub/>.

Literally hundreds of actuaries have supported this effort. Over 30 articles have been written in *The Actuary* in just the last three years. It is very clear that actuaries have a professional duty to consider biodiversity risk. Just as in all our work, biodiversity is uncertain and difficult to quantify.

The IFoA launched its biodiversity policy in July 2023, and this states that we are a profession specialising in risk management. The risks associated with the destruction of the environment and the loss of biodiversity are hard to quantify due to their long-term uncertain and intangible nature. Mitigating this risk is urgent, and the best value insurance policy for society is to reduce our biodiversity loss today to avoid irreversible consequences tomorrow. As our speakers will highlight, the loss of nature has been enormous and will be existential if not halted. We cannot doubt the importance of addressing these risks today to prevent such consequences tomorrow. The core paper that is presented for this sessional meeting is the introduction guide authored by Lucy Saye (2023). Section 4 of the paper includes the impact in the actuarial domain sets of general and life insurance, pensions and investments, as well as the overarching economic impacts, disclosures, reputational risks and regulatory initiatives. Section 5 discusses the opportunities for actuaries, both individually and collectively as a profession. We will hear all about this shortly, as well as the final recommendations of the task force on nature-related financial disclosures.

On the panel we have Professor Aled Jones, who is the Inaugural Director of the Global Sustainability Institute at Anglia Ruskin University. He is an honorary Fellow of the Institute and Faculty of Actuaries and chairs the Biodiversity Working Party. Lucy Saye is a dual-qualified actuary and veterinary surgeon and a past chair of the IFoA Sustainability Board. Lucy is a Life Insurance Actuary specialising in sustainability. She co-authored a report on climate change tipping points for the IFoA and is the author of the IFoA's Biodiversity Practical Guide. Thomas Viegas is Partnerships Lead for the Taskforce on Nature-related Financial Disclosures (TNFD). Prior to joining TNFD, Thomas was at the Bank of England for nearly a decade, during which he led the bank's initial approach and strategy to nature-related financial risks. In 2020, Thomas went on secondment at the UK's Finance Ministry, His Majesty's Treasury (HM Treasury), as an economic advisor and co-author of *The Economics of Biodiversity: The Dasgupta Review* (Dasgupta, 2021). I will hand over to Aled (Jones) to get us started.

Prof A. Jones, F.I.A.: As Nick (Spencer) said, I am chair of the Biodiversity Working Party at the Institute and I have been doing that for a few years now. We have put together a lot of information and data, which are available on the website. The important thing is that we are now moving into a

new phase of trying to operationalise some of the issues we have been investigating. In this discussion, we cover why biodiversity and nature are important for actuaries and for finance. We define what we mean by nature and discuss natural capital, biodiversity and ecosystem services. Often when we are in business or in government, the things that we measure and use are the ecosystem services that nature provides.

That is where we do occasionally monetise things. We regulate and feel the risks and the impacts. Behind those ecosystem services, there is biodiversity and that is the variability of living organisms. The diversity between different species builds in some resilience to nature, so it can withstand some shocks. The way we account for that, and try to measure whether we have sufficient biodiversity to be resilient, or sufficient biodiversity to provide some of those ecosystem services, is by counting our natural capital. That is the stock of everything on the planet that allows us to generate those ecosystem services. Natural capital is all plants, animals, air, water, soils and minerals. Within our accounting for natural capital, when we look at the national accounts for natural capital, we also include things like landscape, the value of trees and oil reserves. So, there is significant variability around the valuation and monetisation of some of these resources.

Obviously, nature underpins everything we do. Everything that we have as an economy, as a society, as a human race, comes from and is derived from nature in some way, shape or form. We depend on nature for our inputs, either directly or indirectly, and our actions impact nature either directly or indirectly. The risks from our engagement with nature can be very large, and they can be unrecognised. As well as risk, however, there is also a huge investment opportunity. Protecting nature and building on it offers a big investment opportunity for finance, business and government.

It is becoming a key issue because nature is at risk. The World Economic Forum currently identifies biodiversity as its fourth highest risk. It is usually in the top five and has been classified as a medium to long-term risk for a number of years. Although the top four risks are all environment and nature-related, whether that is climate change or local environmental destruction, biodiversity in particular is highlighted within that top four. The reason it is in the top four is because of the impact that we have had on nature to date, with one in four species currently at risk of extinction. The issue we face in this respect is that it is very difficult to determine exactly what a species extinction means for economic or human activity. We have lost several species over the last century or so. It is the biggest extinction-level crisis the world has seen since asteroids hit the planet. This is all human-driven, but exactly how a particular species going extinct impacts the resilience of society is quite uncertain. We need to try to understand the linkage between particular risks of degradation as well as extinction, and how that translates into material financial risk as well as the overall resilience of nature over a long period of time.

The reason this is a problem, and we seem to be where we are in terms of driving this huge degradation of nature, is that its effects are largely absent from our measurement. Other than some very particular ecosystem services like flood defences or water or food, where we do value and measure it, for most of our decisions nature is absent. If it is present in our valuations, then usually the valuation is only partial. It only considers that ecosystem service value rather than anything around resilience or cultural value or the wider value for the bigger economy, all of which make the valuation very complex. It is not just a case of what that part of biodiversity does for our supply chain or our business today. There are also timescales and impacts that are complicated as there are important thresholds to consider. There are tipping points in biodiverse areas or in ecosystems which are sometimes difficult to understand or predict. Those thresholds introduce particular complexities into trying to put a value on biodiversity or include it in decision-making. They lead to non-linear changes within ecosystems, and there are a lot of indirect impacts.

One of the key examples of an indirect impact is food supply disruption. While a company may think it has no dependency on biodiversity, if there was no food supply, then, obviously, that would have a huge impact on every single business. Exactly how that translates into a material,

financial risk depends on much bigger economy-wide risks that we must try to consider when we are doing valuations and include in decision-making.

Even if we could value the indirect and direct material risk for the economy, every person and organisation might put a different value on nature or at least on a particular part of nature. A tree in your back garden may have a very different value to you than it does to someone who has never seen it or the same tree in a forest may have a very different value than an isolated tree. We have seen that very recently with the felling of the sycamore in the north of England, along Hadrian's Wall. The cultural and social significance of one part of nature can have a very high value that outweighs its status as an individual piece of biodiversity. We need to also consider those factors when making decisions.

That lays out a very brief introduction to nature and biodiversity and why we think it is important. There is a huge material risk to the overall economy, but increasingly we are able to determine how that becomes a material risk to individual organisations and in decision-making.

Miss L. M. Saye, F.I.A.: I am going to focus on what biodiversity and nature-related risks mean for actuaries. We will walk through some of the key areas of the introductory guide, but with a focus on how we collectively depend on and impact nature; and how that transmits through the economy and the financial sector to impact actuarial work, from both a risk perspective and also in supporting some of the climate and nature goals.

As Aled (Jones) said, nature really is in decline. We have had huge declines in species populations. We have got big impacts across the global land surface and the global ocean area. We have lost over 85% of our wetlands. The big five drivers of this decline are climate change, pollution, land and sea use change, resource change and invasive alien species. Underlying all of those is human activity. We have seen urban areas double since 1992. We have seen a huge increase in plastic pollution, and we are already experiencing a 1.2 degree increase in global average temperatures. Whilst humans are driving this activity, it also has impacts on us. Many of these drivers interact. Climate change is a key driver of biodiversity loss, but biodiversity loss also drives climate change.

We first look at how nature loss drives climate change. When nature is functioning well, it is a store of carbon. Activities that cause nature loss can release carbon into the atmosphere and also affect the climate system. White ice and snow are really important for the albedo effect- reflecting back solar radiation. When they melt and that uncovers a deep ocean, we reflect back less radiation and that leads to more warming. We also have the oceans, which absorb a huge amount of the excess heat, and plants, which absorb carbon dioxide.

The ways in which climate change drives nature loss is through disrupting ecosystems due to heat stress, ocean acidification and sea level rise, which makes it difficult for species to survive.

The deterioration of nature and biodiversity impacts humans, because we are, as a society and an economy, embedded within nature. Some of the examples of how we depend on nature and nature resources are for food, where we rely on animal pollination, soil fertility and nutrient cycling. The quality and availability of that food impacts our health. From an actuarial perspective, on the life insurance and health insurance side, healthcare considerations are important. Therapeutic agents, antibiotics and cancer drugs are derived mostly from nature. It is important for recreational, physical and mental health, whilst at the same time nature loss is a key driver of disease emergence.

We know that 75% of emerging infectious diseases are zoonotic. That means they skip from animals to humans, and biodiversity loss, climate change, and land use change are key drivers of that. It is a brilliant example of where climate change and biodiversity loss increase the level of background hazard for a risk to emerge, and then human systems have certain weaknesses or tendencies in them that allow the risk to completely propagate. If we think of biodiversity loss and climate change, they disrupt wildlife populations, and that drives the emergence of disease within those populations. Then our very well designed human systems, such as our transport networks,

crowded cities and food practices, increase contact points between animals and humans and among humans, and that allows those diseases to spread.

On the actuarial side this has economic impacts. These are not just from a widespread pandemic type risk, but in terms of things like underperformance of agriculture and other localised impacts. There are life and health impacts through increased burden of disease, impacts on mortality and morbidity, and pressures on healthcare systems.

Physical risks are direct risks that emerge due to biodiversity loss. They may undermine our food production, reduce our resilience to climate risks, or just reduce our ability to continue providing ecosystem services, such as water supplies and the activities that depend on them. We also have transition risks—the risks that emerge as policy and societal attitudes change or legal precedents are set. In the UK we have a precedent-based legal system where you point to things that have happened in the past as a justification as to why something is or is not today. These transmit to economic shocks for individuals and businesses. This could be disruptive to businesses that are directly dependent on a particular ecosystem in the form of a reduction in revenue, loss of revenue, or direct property damage if we are looking at reduced protection against extreme weather. Ultimately, it can mean stranding of assets, where assets become obsolete before they reach the end of their expected economic life. It also causes wider economic problems through supply chain disruptions.

When we move this up to the macroeconomic level, we see changes in GDP. Some of the largest economies, such as China, the EU and the US have the largest absolute exposures to biodiversity dependent sectors or nature dependent sectors. The fast-growing economies, such as India, Africa and Indonesia also have a high percentage of their GDP generated from nature-dependent sectors. Inflationary pressures arise as supply chains are disrupted or resources become scarce. All this can feed into balance of payments positions, because we are operating in global trade networks and that can then, of course, feed through into foreign exchange rate changes, and so on.

This is all set within the context of a political environment. Generally, forced migration, resource scarcity and falls in GDP are associated with political unrest and violent conflict. This transmits to risks for financial institutions. Large universal owners of investments and assets, such as insurers and pension funds, run the risk of a reduction in overall returns due to the externalities generated by some companies that have high impacts on nature. These risks are borne across the whole market and are not limited to just those companies. Returns also reduce for businesses that have high dependencies, because of reduced revenues or potential risks arising from the transition and litigation aspects for the high-impact businesses. These translate into changes to credit risk profiles, liquidity risk, operational risk, and, ultimately, market price movement.

On the underwriting side, for life and health liabilities, infectious diseases impact morbidity and mortality. In addition, therapeutic drugs depend on nature; health depends on nutrition; and anti-microbial resistance is linked to climate change and biodiversity loss. Combined, these pressures change the morbidity and mortality profile in quite an uncertain way. Coupled with that, there will be impacts on the healthcare system, whether through an increased acute disease burden or because of longer-term trends.

Regarding general insurance liabilities, aside from protection from extreme weather events, damage to natural structures like forests, wetlands and coral reefs that protect against flooding and storm surge can produce business impacts by translating into property damage and business continuity claims. Crop failures, legal liability, director and offices cover, professional indemnity or general liability also have implications resulting from potential transmission mechanisms. Within all of this, there is the societal risk of the protection gap or the unaffordability of insurance. On the pension side, in addition to the asset and life liability impacts for defined benefit schemes, a key area will be assessing covenant risk and how that might be impacted by nature-related risks.

Investment and underwriting activities facilitate economic activity, which impacts nature. The financial system is contributing to the risks to which it is exposed.

Practically, it may be difficult to assess liabilities since companies have many counterparties and lots of exposures. One useful area to look at is the different economic sectors that are highly dependent on nature and those that have high impacts such as:

- Paper and forest products
- Fishing and aquaculture
- Agriculture
- Metals and mining
- Oil gas and consumable
- Land development and construction
- Food and beverage production
- Hospitality

There are a lot of overlaps between the sectors listed above. Also, these appear in the top ten lists of sectors that are highly dependent on and highly impacted by nature. This list is from the WWF (World Wide Fund for Nature) Biodiversity Risk Filter, but you will get a similar view of the high dependency and high impact sectors from the UNEP (United Nations Environment Programme) Beyond Business-as-Usual report and the Finance for Biodiversity briefing paper. It is important to note that the exact dependency or impact will depend on the location at which the activity is taking place. Most dependency and impact assessments will try to reflect that because you may have an activity that is intrinsically very disruptive to nature. Or, you may have something that, on its own, is not disruptive to nature but by virtue of operating at a site where there are protected species or key biodiversity areas, it becomes very disruptive. It is useful to combine these areas to start thinking about where you might target some of those assessments, at least as a starting point.

The Global Biodiversity Framework has an agreed set of global biodiversity goals from the Biodiversity Conference of Parties in December 2022. The overarching aim is to halt and reverse biodiversity loss by 2030. There are 4 goals and 23 underlying targets as shown in Figure 1. The 4 goals are around restoring and maintaining nature, thinking about how we use biodiversity in a sustainable way, making sure that we are sharing the benefits of nature equally, and including the financial resources to deliver on some of these goals that are directly related to the financial sector (highlighted in blue in the list in Figure 1).

“Halt and reverse biodiversity loss by 2030”

Goal A	Goal B	Goal C	Goal D
<ul style="list-style-type: none"> • Maintaining/enhancing/restoring ecosystems • Halting human induced extinction • Maintaining genetic diversity 	<ul style="list-style-type: none"> • Sustainable use of biodiversity • Ecosystem services are valued, maintained and restored 	<ul style="list-style-type: none"> • Equitable sharing of the benefits from the use of genetic resources including IPLC's • Traditional knowledge protected 	Adequate Implementation: Financial resources, capacity building, technical and scientific cooperation.
1	Effective management of land - and sea-use change, loss of highly important biodiverse areas close to zero by 2030	13	Fair and equitable sharing of the benefits arising from the use of genetic resources
2	Effective restoration of 30% of degraded ecosystems by 2030	14	Integration of biodiversity into policies and development across all sectors
3	Effective conservation and management of 30% of land and 30% of oceans by 2030	15	Enable businesses to monitor, assess and disclose their impacts on biodiversity
4	Halt human-induced extinctions and maintain and restore genetic diversity	16	Encourage sustainable consumption including by reducing food waste by half by 2030
5	Sustainable use, harvesting and trade of wild species	17	Strengthen capacity for biosafety measures and ensure benefits -sharing from biotechnology
6	Mitigate or eliminate the impacts of invasive alien species reduce the rates of establishment of invasive species by 50% by 2030	18	Phase out or reform harmful subsidies in a just way, reducing them by \$500bn by 2030
7	Reduce pollution risks and impacts from all sources by 2030, reduce the overall risk from pesticides by half	19	Substantially increase financial resources, mobilise \$200bn per year by 2030 from all sources, including \$30bn from developed to developing countries
8	Minimise the impacts of climate change and ocean acidification on biodiversity	20	Strengthen capacity-building and technology transfer
9	Ensure sustainable use and management of wild species while protecting customary use by Indigenous peoples	21	Integrated and participatory management including the use of traditional knowledge
10	Sustainable management of areas under agriculture, aquaculture, fisheries and forestry	22	Equitable representation and participation of Indigenous peoples and local communities
11	Restore and enhance ecosystem function through nature -based solutions and ecosystem-based approaches	23	Ensure gender equality in the implementation of the framework
12	Increase the area and quality of urban green and blue spaces		

Figure 1. How to halt and reverse biodiversity loss by 2030.

A recent WWF report on the role of the financial sector in delivering some of these goals looked at insurance underwriting, because the investment side has been much more studied. It highlighted the link between underwriting activity and financing because wherever economic activity is happening it is usually financed and insured. Bank financing often relies on insurance. The report also highlights the importance of industry best practice and broker relationships, stating that you need an industry consensus on standards and alignment. Brokers slice up the risks and divide them between multiple insurers and these standards and best practices could ensure that companies with higher biodiversity or nature standards do not end up losing out on landing their business due to competitive pressures. Other key areas the report addresses are net zero transition plans and external disclosures, as well as influencing others. The key areas are the public policy activity that is happening and the industry initiatives in which a company is involved. We need positive activity: not just an absence of lobbying, but actively lobbying for more stringent standards and the types of support and partnerships that we need to achieve some of these goals. But this is where it does become quite strategic, at least for the insurance sector, and leads to investments in areas such as carbon sequestration, renewables and the rail sector, etc. All of these are key to securing some of these climate goals and for understanding the implications for nature and mitigating some of those.

There are opportunities for products that specifically target some of these areas. For instance, there are already products for mass timber construction that reduced some of manufacturing emissions. Insurance also helps in decommissioning old assets by covering the liabilities that might occur because of those. Other examples are insuring natural assets through initiatives like restoration projects, but also through parametric insurance that pays out when a certain metric, like wind speed, is exceeded. These encourage money to be used to protect natural assets rather than waiting until they are damaged. Another example of insurers' involvement in human wildlife conflict is project Snow Leopard in Pakistan, where they have insured livestock losses due to leopard attacks. The reason they have done that is because it stops retaliation from farmers who are protecting their property. In terms of reducing negative impacts, some of these approaches are really just applying the well known principle that well-designed products reduce moral hazard.

Taking a stronger position on underwriting could translate into some of the exclusions and criteria on the underwriting side. Likewise, engagement on the investment side could translate into excluding sectors such as fossil fuels. The IEA (International Energy Agency) Net-Zero report is clear that we do not need any new investments in oil, gas or coal extraction from 2021 (IEA, 2021). Anything that is out of line with that should not be underwritten. We also need to focus on energy efficiency and on designing products that can help us to reach our goals.

On the Global Biodiversity Framework priorities, disclosures help us to manage some of these risks and demand best practices from our counter-parties so we can drive some of those positive behaviours.

Mr T. Viegas: Aled (Jones) and Lucy (Saye) have laid out the case and the framework for thinking about nature and the transmission into risk and opportunity. Many of us know about climate change and we understand that some of the risks are in the future, but for nature some of the risks are now. Many of us would have grown up learning of biblical tales of swarms of locusts devastating parts of Egypt; or mass flooding leading to the building of arks. If you look around today, you have increasing evidence that invasive species are costing the world economy billions, if not trillions. You have mass flooding and flash flooding in a number of cities, which has led to devastation. The biblical tales of yesterday are becoming the baselines of today and tomorrow. I think that is a really important point that underscores why the Taskforce on Nature-related Financial Disclosures (TNFD) originated from the market appetite for businesses and financial institutions to better understand that their dependencies impact risks and opportunities from nature. As Aled (Jones) has explained, a lack of measurement has led to a lack of management and understanding. From greater disclosure of these issues from businesses and financial institutions,

we will be able to have a new global public good of greater understanding of the private sector’s dependencies, impacts, risk and opportunities on nature.

The TNFD published its recommendations recently, shown at the top of Figure 2. In order to help businesses and financial institutions implement those recommendations, the TNFD has also published a swathe of guidance to help organisations on their nature journey.

What we have published

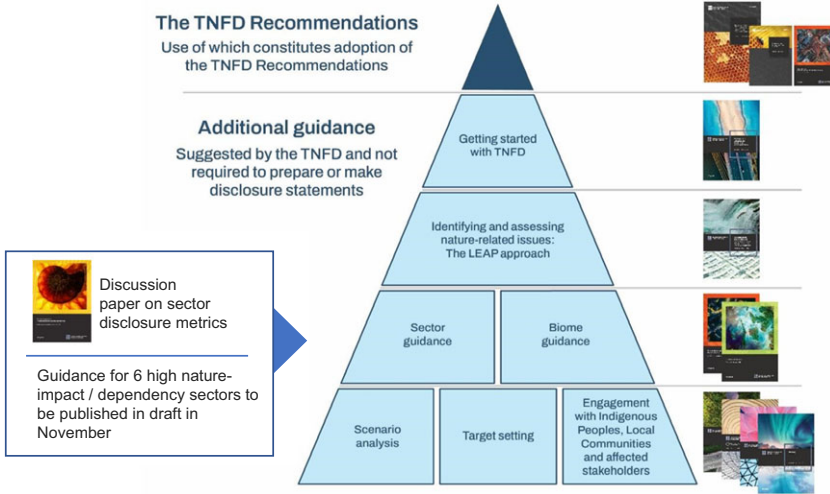


Figure 2. What we have published.

The taskforce’s approach has been to build on others’ work and to work with others.

Our Approach: Building on existing frameworks, tools and metrics

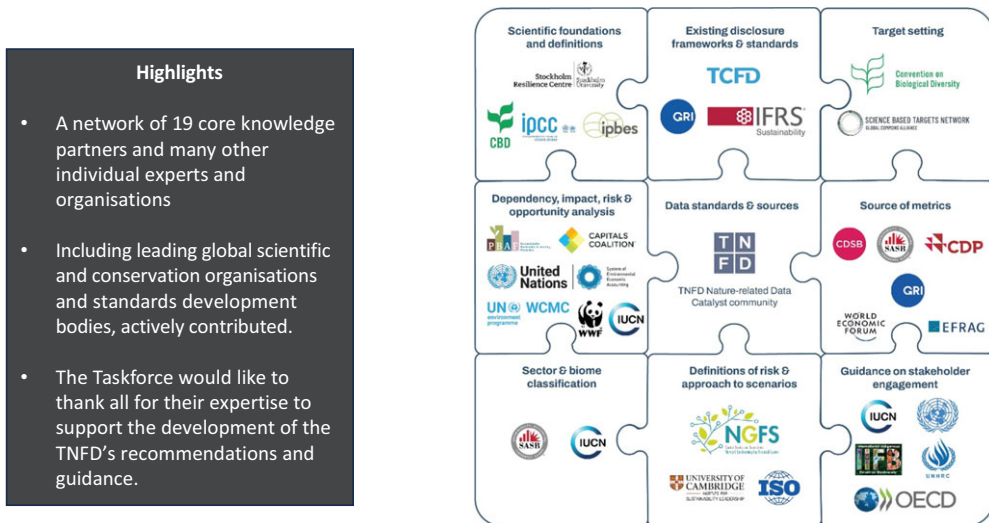


Figure 3 Our approach: Building on existing frameworks, tools and metrics.

As Figure 3 shows, the TNFD has taken the cutting-edge expertise, knowledge and data from a wide range of organisations, including the scientific community, regulators and standard setters, those working in the disclosure space already (such as the Taskforce on Climate-related Financial Disclosures (TCFD)) and others. As a taskforce we had 19 core knowledge partners that have been with us from inception and have helped us all the way on this two-year journey. The culmination of the work that we have published has built on a wide range of stakeholders.

Our Approach: Align to global policy goals & emerging regulation

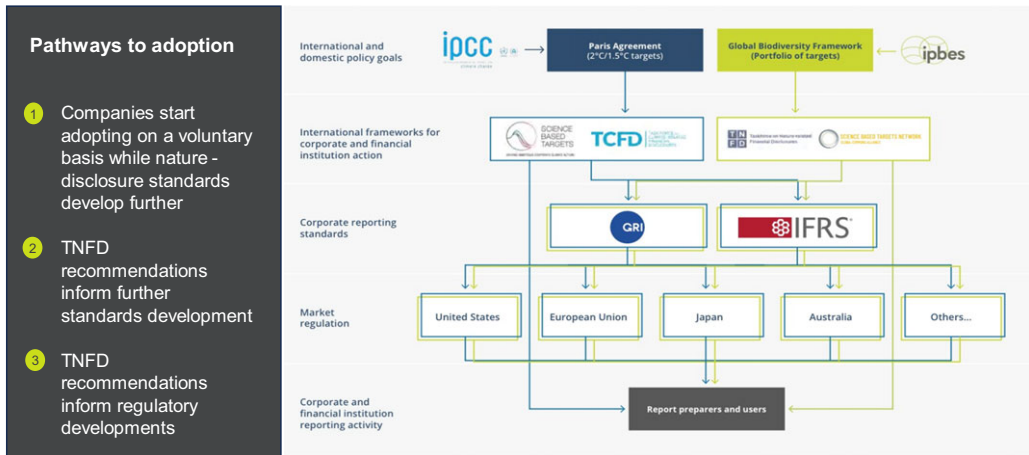


Figure 4. Our approach: Align to global policy goals and emerging regulation.

The recommendations we have published are for voluntary adoption. The degree to which any disclosure element is mandatory is ultimately dependent on regulators and standard setters. But we see the TNFD as lying very much in parallel to the TCFD. As Lucy (Saye) mentioned, we have had the Global Biodiversity Framework, which was agreed in December 2022. Many years before that, the Paris Agreement came into force in 2016. These frameworks were informed by scientific bodies, but in terms of the standard and disclosure side we have had the TCFD, and now the TNFD, with both of their recommendations feeding into standards such as the IFRS’s sustainability standards and the global reporting initiative, and also into many other jurisdictional standards and regulations as shown in Figure 4.

The TNFD recommendations are global recommendations and globally different jurisdictions have different definitions of materiality in terms of what they need. As Lucy (Saye) mentioned, some have already moved, particularly in the EU, towards a double materiality approach. In this approach both the financial risks that result from the impacts that an organisation has on the environment and the risk that the environment has on the organisation are considered. Some jurisdictions, particularly in the US and the UK, still have a single materiality approach. In a nutshell, the TNFD accommodates both approaches, and it has embedded in it a flexible approach to materiality. The recommendations are not advocating a single approach and can be used depending on whichever jurisdiction you are in. The flexibility has been built in after the consultation that the taskforce has done across nearly 40 countries, to understand how we can have a globally applicable framework.

Approach to disclosure: Consistent with TCFD, ISSB, GRI & GBF

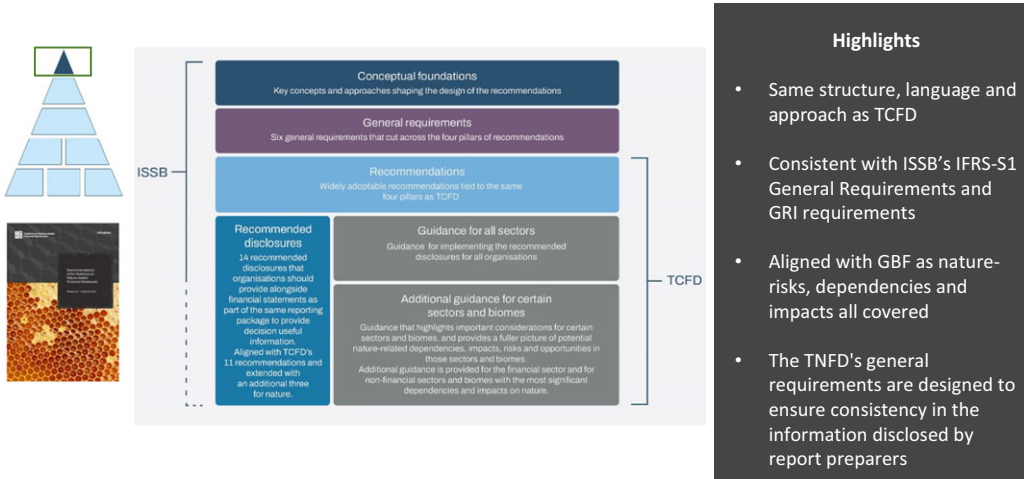


Figure 5. Our approach: Consistency with TCFD, ISSB, GRI & GBF.

This illustration in Figure 5 shows how consistent TNFD is with some of the other standards and regulations. The TNFD recommendations are consistent with the language structure and approach of the TCFD. They are also highly consistent with the sustainability standards of the IFRS's ISSB and the GRI. As Lucy (Saye) mentioned, what is underscored on disclosing on dependency impacts and risk in the Global Biodiversity Framework Target 15 is to “enable businesses to monitor, assess and disclose their impacts on biodiversity”.

The recommended disclosures: Summary

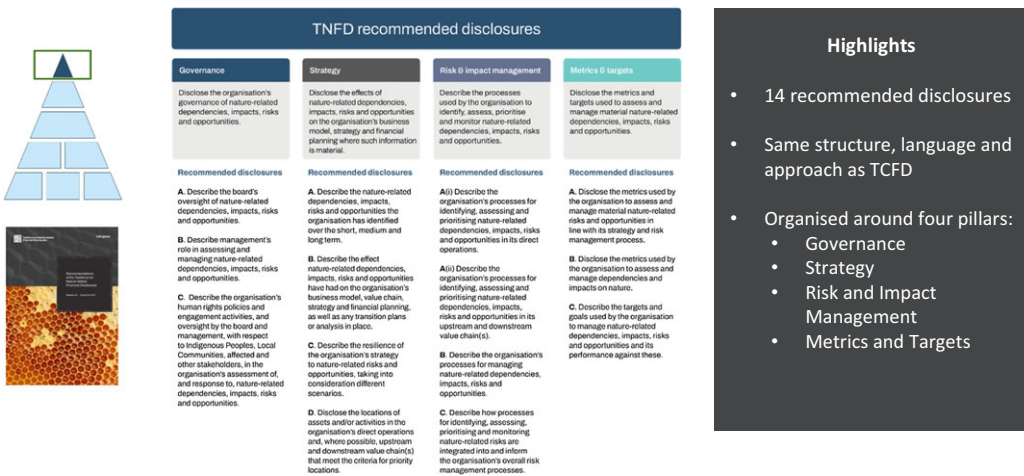


Figure 6. The recommended disclosures: Summary.

Figure 6 shows the recommended disclosures. Out of the 14 recommended disclosures, 11 have been carried over, largely from the TCFD, but have been adapted for nature. Three new ones relate to value chains, priority locations and engagement with stakeholders, particularly indigenous peoples and local communities. The new disclosures have come out of the consultation we have done with the market and our core knowledge partners.

Our approach: Organised around indicators and metrics

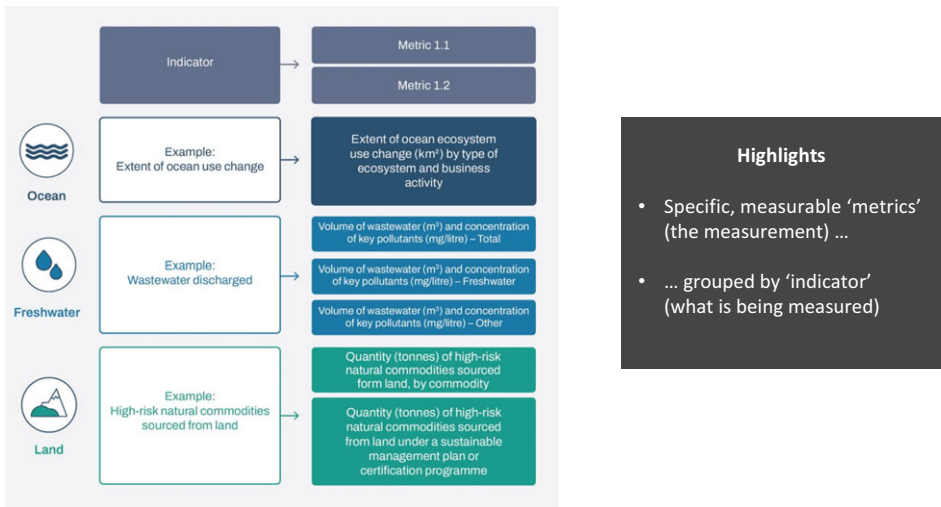


Figure 7. Our approach: Organised around indicators and metrics.

As Aled (Jones) and Lucy (Saye) have already touched upon, there are some inherent issues with measuring nature-related issues. These issues are dependency, impact, risk and opportunity.

The taskforce in its two-year design and development period has identified over 3,000 nature-related metrics, all of differing quality, accuracy and useful at different levels of decision. Unlike climate and carbon, for nature we do not have an equivalent of the greenhouse gas protocol. There is not already a gold standard of what should be measured. We are starting from a basis of a whole range of metrics, indicators and elements of nature and trying to boil it down to what can be decision-useful at a global level.

We have approached this through layering of indicators and metrics as shown in Figure 7. Different elements of nature, such as ocean, fresh water and land, each have an associated indicator and a degree of change, whether that be positive or negative. Thus the TNFD has provided verifiable, measurable metrics.

Those indicators are aligned and consistent with what we know from the best available science as the key drivers of nature loss. The five key drivers of nature loss that have been identified by the global scientific body, Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES), are:

- Land/freshwater/ocean usage
- Climate change
- Pollution/pollution removal
- Resource use and replenishment
- Invasive alien species introduction/removal

The recommendations are asking organisations, companies and financial institutions to measure things that actually matter in terms of impact for the natural world, starting from that scientific basis of what we know is driving the change by making sure that we have the right indicators and metrics.

Providing a focused & flexible set of 'leading indicators'

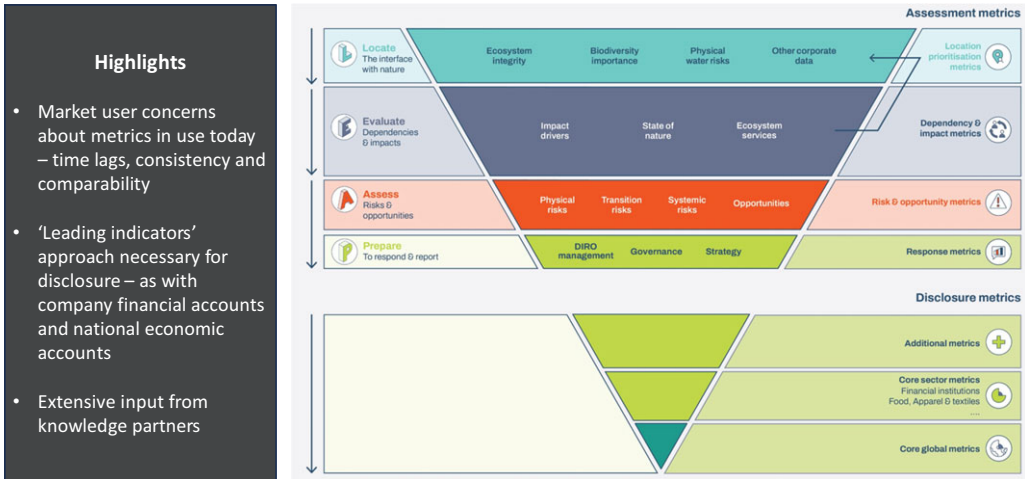


Figure 8. Providing a focused and flexible set of leading indicators.

We used a leading indicators approach to reduce 3,000 indicators to something that is more manageable for organisations. We have a wide range of indicators. We have identified those that may be the most useful for an organisation to use for their own internal assessments and their own identification and assessment of nature-related issues. A subset of those, as shown by the bottom of the inverted pyramid in Figure 8, are disclosure metrics. These are ones that we feel are more applicable and more decision-useful, both at a global level and a sector level.

In terms of what the TNFD recommendations suggest should be disclosed, there is a set of core global metrics, core sector metrics and also additional metrics that may be relevant and useful for a particular organisation.

The global metrics are made up of dependencies, impacts, risks and opportunities. There is a total of 14, with 9 for dependencies and impacts and 5 for risks and opportunities.

Core global metrics – Impacts and dependencies

	Driver of nature change	Indicator
<p style="text-align: center; font-weight: bold; margin-bottom: 10px;">Highlights</p> <ul style="list-style-type: none"> 9 core global impact and dependency indicators organised around the 5 drivers of change identified by IPBES Aligned to goals and targets of GBF Refer to TCFD and IFRS S2 for climate change mitigation metrics 5 risk and opportunity metrics recommended by TNFD for all organisations 	Land/freshwater/ ocean-use change	1. Spatial footprint 2. Extent of land/freshwater/ocean-use change
	Pollution/pollution removal	3. Pollutants released to soil split by type 4. Wastewater discharged 5. Waste generation and disposal 6. Plastic pollution 7. Non-GHG air pollutants
	Resource use/ replenishment	8. Water withdrawal and consumption from areas of water scarcity 9. Quantity of high-risk natural commodities sourced from land/ocean/freshwater
	Climate change	GHG emissions
	Placeholder: Invasive alien species and other	Measures against unintentional introduction of invasive alien species
	Placeholder: State of nature	Ecosystem condition Species extinction risk

Figure 9. Core global metrics: Impacts and dependencies.

Figure 9 shows a high-level overview of all specific metrics and their links back to the drivers of nature change.

Core global metrics – risks and opportunities

Risk/Opportunity	Metric
Risk	1. Value of assets, liabilities, revenue and expenses that are assessed as vulnerable to naturerelated transition risks (total and proportion of total)
	2. Value of assets, liabilities, revenue and expenses that are assessed as vulnerable to naturerelated physical risks (total and proportion of total)
	3. Description and value of significant fines/penalties received/litigation action in the year due to negative nature-related impacts
Opportunity	4. Amount of capital expenditure, financing or investment deployed towards nature-related opportunities, by type of opportunity, with reference to a government or regulator green investment taxonomy or third-party industry or NGO taxonomy, where relevant
	5. Increase and proportion of revenue from products and services producing demonstrable positive impacts on nature with a description of impacts

Highlights

- 5 risk and opportunity metrics recommended by TNFD for all organisations

Figure 10. Core global metrics: Risks and opportunities.

The globally applicable risks and opportunities are shown in Figure 10. They are very aligned with TCFD and the ISSB’s sustainability standards.

Recommended disclosures – Core global metrics for FIs

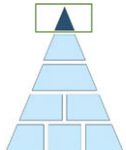

Metric	Metric	Highlights
 Financial exposure to a defined set of sectors considered to have material nature-related dependencies and impacts	For banks: Absolute amount or percentage of lending volume	<ul style="list-style-type: none"> • 2 core global metrics for financial institutions, recognising data dependency issues and to provide a place to start • Expectation FIs will report on the 5 core global risk and opportunity metrics • Expectation FIs will report on the other D&I metrics over time as data is available from investees, clients and customers
	For asset owners and managers: Absolute amount or percentage of invested or owned assets.	
	For insurers: Absolute amount or percentage of net premiums written or total sums insured	
 Financial exposure to companies with activities in sensitive locations	For banks: Absolute amount or percentage of lending volume	
	For asset owners and managers: Absolute amount or percentage of invested or owned assets.	
	For insurers: Absolute amount or percentage of net premiums written or total sums insured	

Figure 11. Recommended disclosures: Core global metrics for FIs.

Given that they are inherently different to corporates, there is more information on the type of metrics relevant for financial institutions in Figure 11. Within the financial institutions the recommendations of metrics have been split between insurers, banks, asset owners and managers, given the inherent differences in their activities and operations.

Our recommendations give very high-level guidance to help organisations report and provide disclosures. The main piece of guidance is what we have called the LEAP approach.

It is a practical guide for any organisation to be able to identify and assess their nature-related issues. It has four main phases, starting with locating the organisation's interface with nature. This means determining how they direct operations and value chains, whether that be upstream or downstream and their interactions with nature. The second is evaluating the organisation's dependencies and impacts on nature. Risks and opportunities in terms of assessment ultimately stem from those dependencies and impacts, and so that constitutes phase three. The final phase is preparing to respond, report and disclose along the lines of the material issues that would have been found through the first three phases.

As part of our process, before delivering this version of LEAP, we have been pilot testing on previous versions. Over 200 pilot testers have informed us about how we can best make such a guide as practical as possible. A number of case studies and examples of how organisations have identified and assessed their nature-related issues are documented as part of this pilot testing.

We are working on the following:

- We are preparing real economy sector guidance documents on the LEAP approach for non-financial institutions.
- We are providing biome guidance for different types of ecosystem and different elements of nature.
- We have already provided some initial guidance on how scenario analysis should be thought about in the nature space, even though it is in its infancy. We are planning to issue a discussion paper by the end of this year to also provide further guidance on approaches that could be used for scenarios, using a workshop approach in response to the feedback about the complexity of climate-related scenario analysis.
- Another forthcoming piece of guidance is for target-setting. This is being done in consultation with the Science Based Targets Network, to provide further guidance to organisations when they get to a point of wanting to set targets, and how can they set scientifically robust targets.

Finally, in working on the recommended disclosures, we have spoken to indigenous peoples and local communities as part of our process for the past two years. For many organisations, particularly in the finance community, speaking to indigenous peoples is not a daily endeavour, so one thing we have made sure of is that part of our release is providing guidance on how organisations can best engage with them, and therefore understand their nature-related issues at a local level. This applies for businesses with supply chains, operating in locations where there is a large population of indigenous peoples and local communities who are stewarding that land. It also applies for financial institutions, which need to be able to make sure that they understand and are engaging with their companies, who should also be engaging with indigenous peoples.

With a lot of guidance and recommendations available, many organisations coming to the topic of nature for the first time are wondering how to get started. One of the things that we also published, unlike the TCFD, was a 'Getting Started' guide: <https://actuaries.org.uk/media/ascndk0h/biodiversity-and-nature-related-risks-for-actuaries-an-introduction.pdf>.

We have provided guidance on how any organisation should get started with the recommendations to assess nature-related issues. The guide has been produced in collaboration with a number of organisations such as:

- Business for Nature
- Capitals Coalition
- CDP
- Finance for Biodiversity

- PRI
- UNEP-FI
- UN Global Compact
- WBCSD
- World Economic Forum

Many organisations have downloaded the guide and have started to put its recommendations into practice quite rapidly.

The summer before releasing the recommendations, we surveyed organisations globally on how and when they would start disclosing along the lines of the TNFD voluntary disclosure. A summary of the results is shown in Figure 12.

It's time to get started – TNFD Global Survey Summer 2023

239 responses from companies and financial institutions across 11 sectors, headquartered in 36 countries.



Figure 12. TNFD Global Survey Summer 2023.

A majority of those firms surveyed indicated that they would start to disclose by 2025 or 2026. There was a large degree of variation in what they would initially include in the disclosures, but governance was seen as an area that they could start with, and also to an extent, particularly for companies, strategy. This is not surprising as we have seen from the TCFD experience, and climate disclosures more broadly, that most organisations have started with the more qualitative disclosures of governance and strategy, as they have built up their understanding on risk, impacts, and metrics and targets.

As examples and disclosures start to come more and more to the fore, one thing that we have already heard but also would expect is that people or organisations will not be producing just single TNFD reports alongside TCFD reports. We as a taskforce do not want ‘death by reports’. Indeed, TNFD aspires to help support integrated reporting over time from the TCFD and TNFD for example. We already have some very early examples of organisations that have started to think about that based on beta versions of our recommendations.

We have been on our website asking organisations that want to start adopting the recommendations to register their intention to adopt. They can register with the TNFD and a cohort of early adopters will be announced at the World Economic Forum in Davos. But organisations such as GSK and some other organisations have already started to publicly announce that they will be adopting.

Moderator: This has been an enormous piece of work, starting from 3000 metrics to determine what you can do and can disclose. Congratulations to you and great thanks for all the efforts and guides. There are some questions.

Mr M. Harrison: Can you elaborate on the workshop approach mentioned in the context of the guidance on scenario analysis?

Mr Viegas: We are working on a discussion paper, on scenarios, and are actively reaching out to and listening to a range of initiatives and organisations. As many of us know, the Network for Greening the Financial System (NGFS), for example, has produced climate scenarios and nature scenarios. There are other initiatives working on nature scenarios as well. By taking a workshop approach we are learning by doing, and trying to understand more to provide the best guidance we can about the state of play.

Moderator: The next question is ‘Are there plans to include the TNFD framework within the ISSB disclosure requirements?’

Mr Viegas: I cannot speak for the ISSB or the IFRS. Ultimately, the extent to which the TNFD is integrated is down to them. Their consultation on the next work priority has recently closed, but nature was one of the candidates for their top priorities. We have worked quite closely with the IFRS and the ISSB as part of our design and development. They have themselves noted that the TNFD recommendations were highly consistent with the sustainability standards they put out, and that they would draw from the TNFD if nature was going to be one of their future work priorities. That means that the TNFD framework will be included, but the extent to which this is done is obviously up to the ISSB.

Mr P. D. Tompkins, F.I.A.: I wanted to focus on the involvement of actuaries. We are not principally focused on measuring things so much as understanding risks. My comment is about the extent to which having these kinds of metrics can lend itself to looking at risks. For example, what sort of risks could be involved in particular activities like, say, those of miners or extractors of water? How might they be mitigated? What is the difference between our measurement approach at the moment and our approach a year ago, for example? Is there likely to be a focus on that kind of change and is this going to be driven by the encouragement to be a good citizen, so that companies will see that there will be bonuses in the form of the appreciation the public has for them? Indeed, the public may be keen to buy the products of companies that are seen to be playing their part in understanding the risks that their businesses could be exposing nature to. I suspect there are no countries where there are obligations for reporting of this kind and, ultimately, if there were to be something like TNFD, it would be coming from the ISSB or a similar organisation. I was wondering about areas that actuaries could be involved in looking at risk. These might, for example, include what is the risk to a pharmaceutical business of a lack of diversity that restricts the ability to develop new drugs. Could you comment on what actuaries might be able to contribute, that number counters are not necessarily going to do?

Moderator: I will put that to Lucy (Saye) in the first instance and then Aled (Jones) to elaborate.

Miss Saye: The use of metrics is really in its infancy. I touched on what a lot of them attempt to achieve. It is, as you can imagine, dependent on lots of assumptions. One of the areas where actuaries will have a key role is in understanding the suite of metrics and the many limitations of those metrics. It is unlikely that you are going to have one or even two metrics that you can look at and say ‘this gives me all the information I need’. There is going to be some balancing of what you are using and how you are using it. I think it is probably also important to highlight that

quantification and numbers do not necessarily give us all the information we need but we should not let that hold us back from making good decisions. We should incorporate things into strategy that we know will move us in the right direction. A lot of that can be done in a qualitative way and this ties in with the use of scenarios. On the global citizen aspect, I think to a degree there is a change in societal attitudes, which is a key driver in terms of customers and in terms of employees expecting more from the people that employ them. I am not aware of obligations of reporting, but it is probably fair to say that we should expect it to develop more quickly than on the climate side. There are lots of interactions with the climate side.

I think there is a move towards disclosures across multiple environmental, social and governance (ESG) areas, rather than just in the area of climate, but bringing nature into those is really important. I think when we are looking at understanding these risks it really is necessary to drill down to get a granular understanding of your business. For a pharmaceutical company you are going to want to understand how your drug development pipeline might be impacted by this. You are probably also going to want to understand where your supply chains are impacted. It is a multi-factor and detailed exercise. It is difficult for financial institutions because you are once removed from the issue. Often you are depending on the underlying counterparties to do some of that assessment. But I think an expectation of that assessment is going to be there. There is a role, I think, for insurers and investors who have risk management skills to engage with those companies. Not just to demand actions or disclosures but to offer help given their skill set. Particularly if there are big counterparties and big exposures at play, then there are collaborative opportunities.

Prof. Jones: I think emphasising the scenarios is important. That is where, I suppose, the metrics and the particular quantified measurements will have a key role to play in putting boundaries on scenarios and in trying to explain them. Importantly, it will be because of the qualitative nature of some of those scenarios that actuaries can really play an important role and where the metrics will be useful. The appropriate use of scenarios is a way to translate metrics into real risks and things that we need to understand and about which we need to make decisions. I am probably less convinced that issues around the global citizen will have a direct impact, but they will have more of an impact through the transition risk. If there is a big local impact on biodiversity, it becomes a topic for government quite quickly and then that becomes a political issue, especially when there is an upcoming election. Where that starts to cascade, and we will see more and more of that, then it will become legislation that will drive different risks. That transitioned risk through legislation will be much more important than the physical risk from biodiversity in the short-term. I think that is a key area on which to focus.

Also, I think it is important to highlight that we think climate change risk is much bigger than bio-diversity risk and we have been doing more about climate change. Whereas we have been addressing biodiversity risk for much longer but at a really small scale. For example, we have had water quality laws and extraction laws for much longer than we have had climate laws. One of the questions is how you aggregate all those things into something that is more coherent and looks at the nature scale risk rather than the local river quality. Aggregation of action on biodiversity is important. The Conference of the Parties (COPs) is trying to put in place global targets. But we have very particular local targets. There is an interesting interplay around transition there that we will need to be cognisant of going forward.

Moderator: An example of the transition risk that we will start to see from regulation is provided by the new EU wide deforestation laws, which will have roughly equivalent laws here in the UK. There is going to be legislation whereby companies must certify their products are deforestation free. We need the compliance and governance process to understand that and understand the risk of non-compliance. But this may also change the way companies need to deal with their supply chains, costs and due diligence. This topic is very closely related to the issue of using disclosures to

create measurable financial impact. I think that is something that we will see emerging. A role we can help to play as a profession is looking at that interaction of the risks and what they mean in financial terms.

Miss Saye: The WWF report touches on the role of insurance companies in environmental rehabilitation, for example, on surety. This is where you are providing public guarantees, normally on big infrastructure projects for government. There is a role there for insurance companies in providing a backstop if a counterparty default occurs. They are still going to be around to rehabilitate that infrastructure project post-closure. It is about trying to do it in a way that is sensitive to nature and not first creating the destruction that we are trying to rehabilitate. It is quite a sensitive topic, but there is a role there. A lot of big infrastructure projects are creating local impacts, which, of course, then brings in the interests of local communities.

Moderator: One myth we have busted today is ‘there is nothing we can do’. There is a great volume of things to do. The challenge is to bring that together, but we are showing pathways to go forward. There is already material in regard to these topics on the website. We look forward to continuing this dialogue and growing this effort as we go forward. It has been a great journey in the last three or four years to get here, but it also feels like we are just beginning and now we can get on with the work. Thank you all.

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