



Independent Research in
Responsible Investment

(How) can the ESG/SRI research value chain respond to the 'nature crisis'?

Discussion draft

*For issue to asset managers and research providers with an active
interest in food, fibre, nature and biodiversity*

For their comments and as a basis for private discussion

*Subsequent to such discussion, an edited of this paper will be
released for public comment via SRI-Connect and other social
media*

Project code: ALV

Overview

Addressing the 'nature crisis' will draw on the full spectrum of available sustainable investment research capabilities

The investment research required to support investors' response to the nature crisis caused by ecosystem service deterioration and biodiversity loss will need to be broader and deeper than the sustainable investment research that has been produced on other subjects.

In the first instance, the following types of research will be required:

- **Case-making research (Foundational)**
 - Research that describes the nature of the 'nature crisis' and shows how it might become relevant to investors
- **Science and policy analysis (From policy onwards)**
 - Research that describes and evaluates the shape and speed of scientific discovery and policy development (at international and national level) with a view to informing investors about likely catalysts for change.
- **Fundamental deep dive analysis (from bottom-up)**
 - Research that analyses the impact that the 'nature crisis' (occurrence, adaptation and mitigation) is likely to have on the key value drivers of individual companies - through in-depth evaluation of company exposure to specific ecological regions, commodity value chains or regulatory regimes

After this, the following types of research may also be needed:

- **'Big data' approaches (from 'top-down')**
 - Research that uses 'big data' to map the asset and value chain exposure of companies to specific ecological regions or commodity value chains.
- **Rough-cut evaluations (from middle-out)**
 - Research that centres on the aggregated grading (or scoring) of levels of company exposure to aspects of the 'nature crisis' and the grading or scoring of the management practices that these companies have in place to manage this exposure - such research is analogous to 'ratings'.
- **Disclosure regulation and client demand mapping**
 - Research that describes the likely evolution of financial disclosure regulation and the development of investor client expectations relating to 'the nature crisis'

Action required

- Research providers will need to assess where their specific research capabilities map onto these different research types and thence where they can best add value to evolving investment debate
- Asset managers will need to:
 - understand the extent and nature of their exposure to the 'nature crisis'
 - identify their top 10 holdings by 'impact on' the nature crisis and their top 10 holdings by 'dependency' on nature (ecosystem services and biodiversity)
 - ensure that they have identified research providers (whether in-house or 3rd party) for all of the research needs identified above
- Companies will need to understand the nature of their exposure to the 'nature crisis' and to develop approaches to communicating this - with their approach to mitigation and adaptation - to their investors and to research providers

Our argument

Expectations that investors will act on 'the nature crisis' are growing...

Five factors are raising expectations that investors will address the interrelated problems of natural capital deterioration, ecosystem service decline and biodiversity loss (together the 'nature crisis'):

- The inherent environmental significance and urgency of the issue
- The likely response of global governments and regulators
- The growth of citizen, consumer & investor concern about the issue
- The fact that a 'line of sight' has been established (via the Dasgupta Review) between the environmental issue and its economic impacts
- The emergence of a response (including the Taskforce on Nature-related Financial Disclosure)

... but investor progress is weak, patchy and optimistic...

However, asset managers are not yet responding effectively to biodiversity loss and the nature crisis.

- **Weak:** A recent report by ShareAction found that none of the world's largest asset managers has published a dedicated policy on specific biodiversity risks and impacts.
- **Patchy:** Some investors are writing thematic pieces on the importance of biodiversity, some have set portfolio-level targets but most are ignoring the issue
- **Optimistic:** investors are searching for high-level comparable metrics which will enable them to evaluate portfolio-level biodiversity risk. Such approaches are cause for optimism (because of the investor engagement involved) but, we fear, highly-optimistic for three reasons:
 - establishing direct linkages between ecosystem quality and investment exposure is likely to be an impossibly complicated exercise
 - the datasets that would result are likely only to be useful to asset managers deploying 'quants' strategies - whereas most sustainable investment managers deploy fundamental bottom-up techniques
 - given the breadth of stocks affected (very few), the data generated is not likely to be statistically-significant - an additional problem for quants managers

The investor response is rational for seven reasons ...

It is tempting for pressure groups to argue that asset managers are being cynical or short-sighted about the nature crisis. However, the muted investor response to the problem is - to a large degree – rational (within the parameters of today's financial system) because:

- Investor exposure is limited
- Within sectors, the issue is complicated
- The issue is not effectively defined for investors
- The issue is not well scoped and can be confused with other environmental issues that investors are already addressing
- The issue is framed as a 'systemic (downside) risk' only
- Sustainable investment's 'go to' solutions are not likely to be appropriate
- Pathways to investment relevance have not yet been clearly articulated

But investors are exposed to the 'nature crisis' in four ways

The 'nature crisis' is likely to affect investors through:

- **Government action:** Action by governments and / or consumers to protect biodiversity in specific biomes will have financial consequences for companies operating in those regions
- **Dependency:** Severe decline in specific ecosystem services or the collapse of individual ecosystems will have consequences for any business that derives value from those services or ecosystems
- **Client demand:** Growing societal awareness may cause investment clients to place expectations upon asset managers that they act to protect biodiversity and to reduce ecosystem service decline ... or some asset managers may do so pro-actively in anticipation of future client demand
- **Financial disclosure regulation:** Action by financial regulators will require disclosure by investors which - in turn - will require action to enable that disclosure to enable the investors affected to paint themselves in a positive light

First, we define the nature crisis and its relevance to investors

Numerous terms are used to describe 'nature' and the crisis enveloping it - which creates confusion for investors and makes it harder to discern investment relevance.

We believe that applying the following terms with the definitions below makes it easier for investors to see clearly where the investment impact of the ecological problems lie:

- The 'nature crisis' - is an umbrella term used to describe the related problems of natural capital deterioration, ecosystem service decline and biodiversity loss.
- Natural capital - is the world's stock of natural assets including geology, soil, air, water and all living things
- Ecosystem services - are the 'services' that this natural capital delivers ... and which supports all life and activity. These include food, water, climate regulation, pollination services etc. They can usefully be divided into:
 - Abiotic services - which are services that delivered by physical or chemical processes (such as water circulation, climate stability etc)
 - Biotic services - which are services that are providing by living things (such as pollination)
- Biodiversity describes the variety of plant and animal life in the world or in a particular habitat (place)

Investor relevance: Ecosystem services are the best 'entry-point' for investors

The nature of ecosystems is, of course, that they are all inter-related.

- Individuals (consumers and voters) are most likely to relate to 'biodiversity' and 'biodiversity loss' because this is what is featured in nature programmes
- Investors, however, are more likely to be concerned about risks and opportunities that arise from ecosystem service decline.

Biodiversity matters to the extent that it protects against such decline. Put another way, biodiversity acts as insurance against decline. As biodiversity is lost, so the insurance cover is lost.

Investor relevance: Biotic services should be the focus

While investors should naturally be concerned about all threats to ecosystem services that the companies that they invest in depend on, they already pay significant attention to risks posed by climate change and water availability independently. Although there are (as always) overlaps, there is merit in investors focusing attention on what is new here - which are the biotic services such as soil and pollination.

Then, we identify six types of research that will be needed by investors

We argue that six specialist types of research will be needed to help asset managers meet the growing expectations that they will face to act on biodiversity and the nature crisis:

- Case-making research (Foundational)
- Science and policy analysis (From policy onwards)
- Fundamental deep dive analysis (from bottom-up)
- 'Big data' approaches (from 'top-down')
- Rough-cut evaluations (from middle-out)
- Disclosure regulation and client demand mapping

Finally, we identify the action required

- Research providers will need to assess where their specific research capabilities map onto these different research types and thence where they can best add value to evolving investment debate
- Asset managers will need to:
 - understand the extent and nature of their exposure to the 'nature crisis'
 - identify their top 10 holdings by 'impact on' the nature crisis and their top 10 holdings by 'dependency' on nature (ecosystem services and biodiversity)
 - ensure that they have identified research providers (whether in-house or 3rd party) for all of the research needs identified above

Companies will need to understand the nature of their exposure to the 'nature crisis' and to develop approaches to communicating this - with their approach to mitigation and adaptation - to their investors and to research providers

Expectations that investors will act on 'the nature crisis' are growing

Asset managers are coming under pressure to respond to the 'nature crisis' from five sources:

Significance of the issue (environmental and economic)

A UNEP FI report '[Beyond Business as Usual](#)' notes that the world's ecosystems have declined in size and condition by 47% globally compared to estimated baselines, and the continued degradation of ecosystem services represents an annual loss of at least US\$479 billion per year.

The World Economic Forum's 2021 [Global Risks Report](#) identified human environmental damage, natural resource crises and biodiversity loss as three of the top risks to the global economy over the next 10 years, in terms of both likelihood and impact.

In 2020, WEF and PwC published their report '[Nature Risk Rising](#)', which showed that more than half of global GDP is moderately or highly dependent on nature and its services and that nature loss impacts most companies through their operations, supply chains and global markets. The highest risk sectors 'rely on either the direct extraction of resources from forests and oceans or the provision of ecosystem services such as healthy soils, clean water, pollination and a stable climate. As nature loses its capacity to provide such services, these sectors could suffer significant losses.'

Response of governments

Later in 2021, the fifteenth meeting of the Conference of the Parties to the Convention on Biological Diversity (CBD) will take place in China— this is essentially the biodiversity equivalent of the climate COP. Its goal this year is to set new global targets for the protection of biodiversity to replace the (mostly unsuccessful) previous targets. There is a good chance that this will be the 'Paris' of biodiversity COPs, with strong targets agreed by governments and concerted action to protect natural capital. This will have material implications for various sectors and for investors' portfolios.

Meanwhile, France's Article 173 has been amended to include biodiversity risk and major French companies will need to report their policies and actions to protect biodiversity.

Growth of citizen, consumer & investor concern

The [Biodiversity Barometer](#) is a project run by the Union for Ethical Bioproducts which has been measuring public awareness of biodiversity for the past decade. Key messages from their 2020 review were:

- In 2020, 78% of respondents say they heard about biodiversity (Brazil, France, Germany, UK and the USA), up from 67% in 2010. Significant increase in awareness was observed in Germany (+32), UK (+20), USA (+16).
- 77% of surveyed consumers feel good when buying products from companies that respect biodiversity and people (81% in Asia in 2019). Even more so younger consumers: 80% of 25-34 years of age feel good when buying products that respect biodiversity (versus 77% all sample); 82% believe it makes a positive impact by doing so.
- The COVID-19 crisis is causing consumers to more seriously consider the health and environmental impacts of their shopping choices.

Media coverage of biodiversity has been increasing, with key messages from the IPBES annual biodiversity review hitting the headlines (more than a million species at risk of extinction), while the Covid crisis has drawn a clear link between pandemics and destruction of natural habitats.

Investors' concern has been increasing with a number of new initiatives looking at how to tackle the problem (see investor response below).

Link to economic impacts

The UK government commissioned a report from Professor Dasgupta on '[The Economics of Biodiversity](#)'. The report concluded the following:

- Our economies, livelihoods and well-being all depend on our most precious asset: Nature.
- We have collectively failed to engage with Nature sustainably, to the extent that our demands far exceed its capacity to supply us with the goods and services we all rely on.
- Our unsustainable engagement with Nature is endangering the prosperity of current and future generations.
- At the heart of the problem lies deep-rooted, widespread institutional failure.
- The solution starts with understanding and accepting a simple truth: our economies are embedded within Nature, not external to it.
- We need to change how we think, act and measure success:
 - Ensure that our demands on Nature do not exceed its supply, and that we increase Nature's supply relative to its current level.
 - Change our measures of economic success to guide us on a more sustainable path.
 - Transform our institutions and systems – in particular our finance and education systems – to enable these changes and sustain them for future generations.

A report by the [Dutch National Bank](#) last year showed that Dutch financial institutions have EUR 510 bn of exposure to companies with high or very high dependency on one or more ecosystem services, or more than a third of their total exposure. While the Dutch economy is highly-leveraged to agricultural (relative to its overall size), these numbers are significant and analysis of other countries with high levels of exposure to ecosystem services might reveal a similar picture. It is also significant in being the first clear sign of a regulator analysing the risks and attempting to quantify them.

The emergence of a response

As ever, the first steps towards a response (even if faltering) often engender further steps. Proving that a response is possible is often the hardest part.

In 2020, the Task Force on Nature-related Financial Disclosures ([TNFD](#)) was launched to replicate the work of the TCFD on nature more broadly, rather than just climate, although the two sets of risks are closely inter-related. The Taskforce 'will provide a framework for corporates and financial institutions to assess, manage and report on their dependencies and impacts on nature, aiding in the appraisal of nature-related risk and the redirection of global financial flows away from nature-negative outcomes and towards nature-positive outcomes.' Recommendations will be released in 2022 and it is likely that these will have a similar impact to those of the TCFD, with companies and investors reporting more holistically on climate/nature risk.

Investor progress is weak, patchy and optimistic

Weak

So far, asset managers are not responding effectively to biodiversity loss and the nature crisis.

Investor campaigning group ShareAction recently introduced a biodiversity rating for large asset managers in their '[Point of No Returns](#)' series of reports. They concluded that:

- 'Not one of the world's largest asset managers has published a dedicated policy on specific biodiversity risks and impacts
- "Only 11 per cent reference a need to mitigate the negative impacts on the natural environment in their investment policies."
- 86 per cent of asset managers still make no reference to ecosystem protection, natural capital or biodiversity in their policies.'

Credit Suisse and Responsible Investor recently issued a report '[Unearthing Investor Action on Biodiversity](#)' which noted that 'there is an urgent need to capture investors' rising interest in biodiversity. Most respondents are concerned about biodiversity loss and believe it needs to be addressed within 24 months, but this is not yet reflected in their actions.' They added that 'investors are struggling to identify and consider biodiversity-linked investment opportunities. Biodiversity needs to be made more digestible and measurable for investor concerns to translate into investment action' but that 'more than half of the respondents believe biodiversity will be one of the most important topics in the investment community by 2030'.

Patchy

Investor focus to date has largely centred on deforestation (notably in respect of palm oil). There has also been increasing engagement with Brazilian companies and the government around deforestation caused by soy and cattle farming. Investor action on these specific areas is often limited to engagement as the investors concerned rarely have sufficient levels of ownership in the companies concerned to make capital reallocation a realistic promise or threat.

A number of investors are beginning to write broad thematic pieces on biodiversity, such as [Aviva](#), [Aberdeen Standard](#) and [AXA IM](#), while other are focusing on biodiversity as an engagement topic, for example [Robeco](#) and [EdenTree](#).

In addition, a number of investors have made commitments around deforestation, such as [Storebrand](#) and [Actiam](#). Such commitments will clearly need metrics against which they can be measured across their portfolios.

Collaborative action by investors has begun with the launch of the Finance for Biodiversity [pledge](#) from 37 financial institutions who have committed to set targets 'based on the best available science to increase significant positive and reduce significant negative impacts on biodiversity' and to engage with companies.

In 2020, a Discussion Paper from the Principles for Responsible Investment, '[Investor action on Biodiversity](#)', highlighted a number of 'barriers to scaling up institutional investor action on biodiversity' including:

- A lack of incentivising regulation and no global targets on biodiversity
- A lack of data to evaluate corporate risk exposure and a lack of metrics
- A lack of specialist knowledge on biodiversity dependencies and outcomes

Optimistic

In January 2020, four French asset managers – AXA IM, BNP Paribas AM, Mirova and Sycomore AM – launched a '[joint initiative](#)' to develop a pioneering tool for measuring investment impact on biodiversity'. They have teamed up with Iceberg Data to create a methodology for measuring the impact of a company's activity on biodiversity.

It is unclear at this stage how such a metric could offer sufficient asset-level granularity to properly assess companies, as opposed to creating a broad and vague metric which largely identifies operational exposure to ecoregions.

The investor response is rational for seven reasons

Provocatively, perhaps, we have characterised the investor response to biodiversity (so far) as being weak, patchy and optimistic. We now examine whether this investor response is rational.

Not all problems that the world faces can be solved by investors (as any investor seeking exposure to all of the UN Sustainable Development Goals knows). So, with an open mind, we ask whether the low priority that investors appear to have accorded to biodiversity thus far is:

- An active and rational decision - made on the basis that investors cannot realistically extract value from analysing the issue or contribute meaningfully to resolving it
- A passive and disengaged non-response - because the issue is difficult and investors don't want to think about it

Investment exposure is limited

Investor exposure to the 'nature crisis' is much less than it is to other sustainability issues for the following reasons:

- The vast majority of exposure and impact lies within a handful of sectors (those with exposure to food and forestry value chains).
 - (There is some exposure in mining and a small amount of exposure in other sectors. See [Business & Biodiversity Campaign](#))
- Consumer staples sectors (beverages, food and staples retailing, food products etc) account for only 6.5% of the S&P 500
- A large proportion of the food production value chain is in private ownership - this leads to limited investor exposure to relevant economic activities and therefore to the underlying environmental issue. It also means that investors have influence over a very small percentage of the relevant assets.

Within sectors the issue is complicated

- Even within the food production sector, the risks and opportunities facing different companies are diverse. They are commodity- and region-specific. The risks facing a producer or processor of beef, such as increased regulations around deforestation, are different from the risks facing a producer or processor of wheat, such as crop devastation from pests.
- Also, significant parts of the food value chain are commoditised - increasing the complexity and reducing the impact of supply-chain intervention - intense, near universal action is typically required to decommo-ditise value chains. Such universality is highly unlikely to be achievable nor necessarily appropriate.

As a result, any attempts to create universal indicators of exposure or risk on this issue - beyond simplistic indicators of management engagement - are unlikely to be meaningful.

The issue is not effectively defined for investors

The issue of concern is often stated as 'biodiversity loss'. This is indeed an issue of scientific concern and of concern to citizens. It is therefore likely to be a motivator of political action. However, 'biodiversity loss' does not have a direct impact on companies and investors.

Companies are typically impacted by the depletion of (or measures taken to mitigate the depletion of) 'ecosystem services'.

To use a financial metaphor, ecosystem services are the raw materials that a company receives, natural capital is the asset that produce those raw materials. Biodiversity is the insurance policy that ensures that the natural capital is protected and can continue to supply companies with those raw materials.

No investor would start their evaluation of a company by looking at their insurance policy. Their security of their raw materials (i.e. ecosystems and ecosystem services) is a much more helpful concept.

The issue is not well scoped and related to other issues that investors are already addressing

Ecosystem services can be divided into:

- Abiotic services - which are services that delivered by physical or chemical processes (such as water circulation, climate stability etc)
- Biotic services - which are services that are providing by living things (such as pollination)

(Self-evidently, the two are highly interrelated)

However, as investors largely consider abiotic services in other areas (climate stability, water availability etc), we think it is helpful to focus here on the biotic services.

The issue is framed as a 'systemic (downside) risk' only

Globally, biodiversity loss is a major net downside risk. However, this presentation fails to engage investors for two reasons:

- Investors rarely (if ever) see it as within their mandate to address systemic risks - they are much more comfortable with specific risks
- (Equity) investors can be more readily engaged when there is upside opportunity to capture as well as downside risk to avoid

In respect of ecosystem services, there are specific risks and there are upside opportunities. Investors can engage with both of these and presenting the issues in these terms is, therefore, advantageous. Framing the 'nature crisis' as being solely about 'systemic downside risk' is neither necessary nor advantageous.

Sustainable investment's 'go to' solutions are likely to be unachievable or ineffective

'Go to' #1 ('middle-out' ratings)

- The solution: The first 'go to' solutions for sustainable investors - facing a new issue - involve cross-sectoral benchmarking of company exposure and management practices (often loosely referred to as 'risk').
- The problem: Whilst management practices in this respect may be roughly evaluated (Does your company have a biodiversity policy? Have you set targets? etc), the nature of ecosystem service exposure of different companies is so diverse for any comparison between them to be meaningless.
- The application: As discussed below, there will be a role for 'middle-out' rough cut evaluations and ratings in moving the debate forward. However, the simplification inherent to these approaches should be noted.

'Go to' #2 (top-down data)

- The 'solution': The second 'go to' solution for sustainable investors is seek granular data in the hope that these can be combined with financial data via quantitative techniques into measures of risk.
- The problem: Here, the breadth, depth, specificity and interconnectedness of such data would have to be so great that it seems highly implausible that it will be possible to derive signal from the noise.
- The application: These approaches are likely to be used once regulators start asking (as some already are) for portfolio-wide reporting on biodiversity impact. They are, therefore, inevitable. However, the risk of using these without fundamental bottom-up analysis to direct them should be noted.

As we discuss below, other approaches to sustainable investment research are much more promising.

Pathways to investment relevance have not yet been clearly articulated

- While there is a systemic risk to all of society (that biodiversity drops below required levels), the risk to investors will only manifest in specifics (e.g. a loss of pollination capacity affecting users of specific crops).

- Finally, the pathway to financial impact is - at this stage - somewhat theoretical. This makes it harder to gain the focus of investors. (That said, 'carbon net zero' would have been seen as 'theoretical' in business and investment circles eighteen months ago but is now so widely assumed that the debate has moved from 'whether' to 'when'.)

But investors are exposed to the 'nature crisis' in four ways

How might biodiversity become a material issue to investors? We argue that there are four possible pathways:

- **Government action:** Comprehensive action by governments and / or consumers to protect biodiversity in specific biomes (most likely driven by a coordinated drive to protect biodiversity globally) with financial consequences for companies operating in or dependent on those regions
- **Dependency:** Collapse of individual ecosystems or ecosystem services that support a value chain that businesses depend on (such as pollination collapse, or a new pest which wipes out palm oil plantations)
- **Client demand:** Growing societal awareness may cause investment clients to place expectations upon asset managers that they act to protect biodiversity and to reduce ecosystem service decline ... or some asset managers may do so pro-actively in anticipation of future client demand
- **Financial disclosure regulation:** Regulatory action around disclosure which inevitably leads to underlying action from investors to align their portfolios (eg from the TNFD, Article 173)

Government action

Global governments are due to meet in late 2021 for the biodiversity equivalent of the climate COP, and there is a chance that this will produce the 'Paris Agreement' for nature.

An interim [report](#) by the OECD suggests that targets might include the preservation of 30% of land and marine areas for conservation purposes. Other suggested targets include to 'put in place, by 2030, regulatory and other policy frameworks that ensure a 100 per cent divestment from activities that cause ecosystem destruction and lead to perverse incentives towards biodiversity destruction and loss'.

We have already seen the consequences of government reactions to biodiversity risks. In 2018, the European Union banned neonicotinoid insecticides in response to scientific concern that they were killing bees. More stringent and global standards for biodiversity protection could have far-reaching consequences for industries, for example:

- Agriculture, mining and infrastructure – from increased protection of high-biodiversity areas
- Chemicals and manufacturing – from increased regulation around pollution, especially from pesticides
- Retail and beverages – from increased regulation on plastics to reduce marine and land pollution

Dependency

The Natural Capital Finance Alliance's [Encore](#) tool sets out the dependency on natural capital of every production process in the economy, enabling investors to assess which sectors and sub-sectors are most dependent on the ecosystem services underpinned by biodiversity. While the highest-dependency sectors are fairly obvious – agriculture, forestry – there are also some less obvious dependencies. Distillers, water services and cable and satellite installations all have medium risk exposure to soil quality, for example.

The science suggests that increasing biodiversity loss is likely to cause more severe economic impacts in the future, from minor disruption of commodity production through to possible collapse of individual ecosystems or ecosystem services that support an entire value chain that businesses depend on. Translation of this science into research for investors – as has been done with climate science – will be a vital service.

Client demand

In addition to the (limited) investment exposure, large institutional investors also have their own reputations to consider. In this respect, ignoring biodiversity is not a rational act:

- The magnitude of the problem, and the fact that links have been established between biodiversity and the economy, mean that the public will judge investors with a public profile that do not act

- Because the problem is visible and will become increasingly visible, investors' clients with environmental priorities are likely to demand a response from their asset managers

When reporting to clients and wider stakeholders about their actions on sustainability issues, investors will need to demonstrate:

- Breadth of coverage – (all exposures) – to demonstrate that they have not just cherry-picked the good stories
- Depth of understanding – to demonstrate that they have given the issue more attention than a cursory green-washed nod

For example, in the Finance 4 Biodiversity pledge, investors have committed to 'report annually and be transparent about the significant positive and negative contribution to global biodiversity goals linked to our financing activities and investments in our portfolios'. This would appear to be a pre-emptive response to likely future pressure from clients

When preparing their first reports, these investors will face an interesting choice between writing:

- reports that are bottom-up, focused and investment-relevant ... but not comprehensive or
- reports that are top-down, metrics-driven but are ultimately not investment-relevant

Financial disclosure regulation

French regulators are replacing Article 173 of the Law on Energy Transition for Green Growth (LTECV) with [Article 29](#) of the Energy and Climate Law over the coming months. The new regulation expands disclosure obligations for large companies and investors to include biodiversity. It also requires investors to provide information on the proportion of their assets which comply with the EU Taxonomy.

Investors are now obliged to disclose their biodiversity-related risks and dependencies, their contribution to biodiversity conservation and their strategy to reduce biodiversity impacts. This information must include specific targets and alignment with international biodiversity goals.

With the launch of the TNFD, a voluntary framework will be established for investors to report on biodiversity impacts and dependencies. As with the TCFD, we would expect this to become integrated within financial disclosure regulations over the coming years.

Conclusion

The challenge facing asset managers therefore is not 'whether to act' but 'how to act in a way that is':

- Value-adding from an investment perspective - by pre-empting governmental intervention and dependency issues
- Credible from the perspective of a societal stakeholder - and reportable to clients
- Reportable to regulators

Six types of research that will be needed by investors

Six types of research that will be needed by investors.

As noted above, investors will find themselves having to act in order to capture specific investment opportunities, to satisfy clients and to maintain their licence to operate.

So, we now turn our attention to the contribution that research by external providers might make in helping to meet these needs of asset managers.

Ultimately, we find that the research that is needed by asset managers to tackle the issue of biodiversity is highly likely to come from third parties (rather than be undertaken internally by asset managers) because it is either much broader or much deeper than asset managers can typically resource themselves.

Six research approaches may be viable and contribute to different aspects of the investment process:

- Case-making research
- Science and policy analysis
- Fundamental deep-dive analysis
- 'Big data' approaches
- Rough-cut evaluations
- Disclosure regulation and client demand mapping

The nature of these different types of research are detailed in the table below:

Research types

Research type:	Case-making research	Science and policy analysis	Fundamental deep-dive analysis	'Big data' approaches	Rough-cut evaluations	Disclosure regulation and client demand mapping
Direction from which research will be developed	<i>Foundational</i>	<i>From policy-onwards</i>	<i>From bottom up</i>	<i>From top down</i>	<i>From middle out</i>	<i>From disclosure back</i>
Definition <i>This is research that ...</i>	... describes the nature of the 'nature crisis' and shows how it might become relevant to investors	... describes and evaluates the shape and speed of scientific discovery and policy development (at international and national level) with a view to informing investors about likely catalysts for change.	... analyses the impact that the 'nature crisis' (occurrence, adaptation and mitigation) is likely to have on the key value drivers of companies - through in-depth evaluation of company exposure to specific ecological regions, commodity value chains or regulatory regimes	... uses 'big data' to map the asset and value chain exposure of companies to specific ecological regions or commodity value chains.	... centres on the aggregated grading (or scoring of levels of company exposure to aspects of the 'nature crisis' and the grading or scoring of the management practices that companies have in place to manage this exposure.	... describes the likely evolution of financial disclosure regulation and the development of investor client expectations relating to 'the nature crisis'
Application <i>This type of research will be used by investors to...</i>	..frame the issue, raise awareness with colleagues, identify the questions that need to be answered	...increase investor understanding of potential risks and opportunities arising from scientific developments and policy changes	...make investment decisions based on the exposure of individual companies to the issue	...enable portfolio-level risk filtering and alignment with any global targets that may be set	... engage with companies to elicit more detailed information - thereby enabling focused analysis	...meet their disclosure and client reporting obligations
Likely provider type <i>This type of research is most likely to be provided by...</i>	... academia, grant-funded providers & specialist independent firms	... specialist policy tracking organisations (and the research arms of NGOs) who are already deeply engaged in policy discussions)	... sell-side firms, independent research providers & grant-funded research providers	... grant-funded providers, financial data providers & academia	... ESG ratings agencies & grant-funded providers	... industry bodies and legal / compliance advisors who track and report on developments in financial services disclosure regulation and by research providers acting on their behalf

Research type:	Case-making research	Science and policy analysis	Fundamental deep-dive analysis	'Big data' approaches	Rough-cut evaluations	Disclosure regulation and client demand mapping
<p>Limitations</p> <p><i>The limitations of this type of research are that it...</i></p>	...has no link to valuations or investment action	...requires policy understanding and sector knowledge and will need collaboration to produce	...requires in-depth knowledge of companies and commodity value chains, expensive to produce	...is simply a measure of a company's exposure to regions rather than actual impact or reliance on biodiversity	...is not focused enough for investment decision-making and not objective enough for regulatory reporting	...is not necessarily investment-decision relevant
<p>Challenges / Questions to address</p> <p><i>Before developing this type of research, issues that providers need to consider / questions that providers need to answer include:</i></p>	Links have been established between biodiversity and the broad economy, but this has yet to be articulated in terms of direct investment relevance	Requires collaboration between science, academia, policy and business researchers but vital for sector analysts to understand possible valuation implications	Broad range of possible research, from specific commodity supply chains (eg palm oil) through to consumer preferences shifting (eg alternative meat), legislation banning chemicals (eg neonicotinoids), more efficient agriculture etc.	Link between biodiversity data and asset-level data is complicated and expensive; often a measure of a company's exposure to regions rather than actual impact or reliance on biodiversity	Comparability is almost impossible beyond sub-sector level; creating a metric which gives investors false confidence that they are tackling biodiversity loss will prevent real action.	<p>Limitations of available data, especially comparable data on a global scale.</p> <p>The major challenge will be for initiatives such as the TNFD to create meaningful metrics for investor disclosure</p> <p>Translation of metrics into action by investors</p>

Research produced to date

Case-making research

There has been considerable coverage of biodiversity and its implications for business over the past couple of years.

The World Economic Forum: [Global Risks](#)

Released in January 2020 last year's report set out biodiversity loss as the fourth highest risk to the global economy in terms of impact and likelihood. This was followed by a report on [Nature Risk Rising: Why the Crisis Engulfing Nature Matters for Business and the Economy](#).

HSBC: [Paradise Lost? Why Investors must address the biodiversity crisis next](#)

The natural world is under threat as never before, via deforestation, land degradation, pollution of the water, air and soil, hunting and harvesting, and climate change. Moreover, as our population increases and we pursue economic growth above other development metrics, so the threat intensifies.

Like many sustainable development challenges, and perhaps more so, protecting and restoring biodiversity remains extremely complex.

Yet in recent quarters, HSBC noticed an emerging trend amongst the global asset management community - a greater focus on the impact of investments and issuers on biodiversity and ecosystems. Therefore, in this note HSBC explore three questions: Why are we losing our biodiversity and why does that matter? How is the world mobilising to protect its ecosystems, which countries are a conservation priority and is there a role for trade policy here? And what can investors do?

UBS: [Biodiversity: Moving markets](#)

More frequent (and urgent) commentary on biodiversity loss has implications for markets. The report includes:

- Biodiversity, human behaviour, pandemics, and markets
- The importance of systems thinking; everything is connected
- Rewilding projects as a potential solution
- Sustainable food systems as an opportunity

Barclays: [Biodiversity: Investing in nature](#)

- More stringent certification will drive growth in geospatial data services.
- Regenerative farming will help with profitability as well as preservation
- 'Planet-compatible consumption' will unlock \$1 trillion by 2030

Credit Suisse: [Engaging for a Blue Economy](#)

- Tourism, shipping, energy generation, and food production are just a few of the industries that rely on the oceans.
- Climate change and the unsustainable use of marine resources are deteriorating the health of the oceans, putting ocean-related businesses at risk as well as those whose livelihoods depend on them

ISS-ESG: [Background report: Biodiversity](#)

- The policies of most companies in high-impact sectors fail to adequately manage biodiversity risks.
- A weakening foundation of natural resources and biological inputs erodes the resilience of long-term investments.
- Depending on their industry, companies have different levels of exposure to, and impacts on, biodiversity-related risks, including access to natural resources, regulatory changes, and reputational and litigation risks.

- Growing public awareness of global environmental issues has given rise to expectations for government action as well as for heightened due diligence by business and the financial sector. The consideration of business impact on biodiversity is an important aspect of sustainable finance.
- Effective investor due diligence is aided by data on industry-specific risks and activities

Science & policy analysis

Morgan Stanley: [‘The Future of Food: Four solutions for a hungry planet’](#)

By 2050, the world's population is forecast to surpass 10 billion people. To keep pace with population growth, the UN estimates that the global food supply will need to increase 50% over current volume to accommodate projected demand.

However, there's a slight wrinkle: At the same time, climate change will threaten at least 36% of the four largest crop groups (rice, maize, wheat and soybean). In addition to producing enough food for an ever-increasing population and eliminating malnutrition, we'll also have to do it sustainably, cutting roughly 13 gigatons of greenhouse-gas emissions in order to curb climate change.

Solving this puzzle will require ingenuity, investment—and some hard compromises.

Barclays: [Food Revolution](#)

With a global population forecast to reach 10 billion by 2050, we think there are few more important issues than how to sustainably feed people. From the debate on agribusiness, the carbon footprint of food production, and food waste; to plant-based meat and dairy alternatives – and even insect protein – Barclays research investigates the changes we should expect in the coming years, and the effect on companies and consumers across the food value chain.

Boston Consulting Group: [Food for Thought - The Protein Transformation](#)

- Concerns about the environmental costs of growing all the animals we eat, how those animals are treated, and the consequences for human health of eating so much conventional protein are rising even faster than consumption.
- That's why alternative proteins have morphed in just the past few years from a niche product to a mainstream phenomenon. Consumers will soon be able to make nine out of ten of the world's most popular dishes—especially those using less-structured meat, such as ground beef—with reasonably priced alternative proteins.
- By 2035, after alternative proteins reach full parity in taste, texture, and price with conventional animal proteins, 11% of all the meat, seafood, eggs, and dairy eaten around the globe is very likely to be alternative. With a push from regulators and step changes in technology, that number could reach 22% in 2035.
- The shift to alternatives can make a real contribution to the efforts to combat climate change. By 2035, the shift to alternatives will save as much carbon dioxide equivalent (CO₂-e) as Japan emits in a year, conserve enough water to supply the city of London for 40 years, and promote biodiversity and food security.
- The protein transformation will depend, of course, on whether consumers are willing to try—and willing to continue eating—alternative proteins, and that will depend on advances in the technology for producing them at parity.
- BCG's report, provides a first-of-its-kind market model, supported by discussions with more than 40 experts in the field, and an in-depth analysis of the technology behind alternative proteins.
- This allows them to point to specific ways in which all stakeholders, from growers to producers to consumers and investors, can support and benefit from the protein transformation.

Fitch Ratings: [ESG Credit Trends 2021](#)

- Biodiversity is receiving a surge in interest from investors and stakeholders, although it is currently relatively under-reported. KPMG's survey found that only 23% of companies that report on sustainability and operate in sectors considered at high or medium risk from biodiversity loss (such as utilities and mining) report on the risk.

- There are already select examples where regulation related to biodiversity is influencing credit risk. Tereos SCA (BB-/Negative), a French commodity producer and trader, has an ESG.RS of '4' for "Exposure to Environmental Impact" as sugar production in 2020 has been affected by regulation restraining the use of nicotinoid-based insecticides in beetroot farming. The regulation was in part introduced due to the damage that these insecticides had on honeybee populations.

Ceres: [Soil health and biodiversity](#)

- Current soil management practices threaten the nutrition and productivity of food systems. About one-third of soil worldwide is moderately to highly degraded due to erosion, nutrient depletion, acidification, salinization, compaction and chemical pollution. These factors deplete and contaminate the water resources used to grow and process food, increase operating costs and interrupt supply chains due to lower and less dependable crop yields.
- Pesticides and herbicides used in agriculture can also negatively impact essential services provided by insects, bats and birds, which pollinate 35% of the world's food crops. Pollination-dependent crops, such as coffee and cocoa, are valued 500% higher than crops that do not need pollination. Importing pollinators comes at a high cost and a majority of farms depend on biodiverse and naturally available species. Honeybee pollination alone contributes \$15 billion annually to U.S. agricultural production.
- Among the most commonly sourced commodities profiled in Engage the Chain, impacts on soil health and biodiversity are significant in the production of beef, fiber-based packaging, palm oil, and soybeans.

Fundamental deep-dive analysis

UBS: [Food of the Future](#)

In this second Q-Series report on "**Food of the Future**", UBS IB map out what the coming revolutions in food and agriculture will mean for investors in global chemicals.

- The first consideration refers to how chemical and agricultural machinery companies will need to adapt to two fast-emerging trends:
 - a generational shift in diets as alternatives to animal meat build traction
 - the commercialisation of gene editing technology in seeds
- To investigate these implications, UBS Evidence Lab surveyed 3,000 consumers, 120 US-based farmers, reviewed 20+mn social media interactions and engaged with industry experts.
- An interactive model is launched which isolates sensitivities to grain markets from the twin forces of lower growth of global meat consumption and the potential impacts of gene editing.
- The speed and trajectory at which consumers adopt the meat alternative market will have significant implications for seed, fertilizer, crop protection (CP), consumer ingredients, machinery and animal feed companies.

IHS Markit: [The Future of Asian Biofuels & Feedstock](#)

- Asia is a critical supplier in the global biodiesel feedstock market. Southeast Asia, the largest exporter of palm oil globally, is the single biggest source of biodiesel feedstock in the world, with the region also being the largest exporter of used cooking oil (UCO), led by China.
- Regional biofuels policies focus on increasing energy security and supporting local agriculture.
- Regional adoption of ethanol will be limited by high ethanol prices and aggressive electrification of vehicle fleets. The potential electrification of the region's enormous motorcycle fleet would affect biofuels demand dramatically, particularly in countries like Indonesia, Vietnam, and India, which have outlaid plans for electric motorcycles.
- The region's nascent interest in hydrogenated vegetable oil (HVO) investments is likely to grow owing to the rising interest, worldwide, in developing sustainable aviation fuel (SAF).

Sustainalytics: [Investing in the Circular Food Economy](#)

- In a bid to preserve natural capital for future generations, governments are progressively pushing for regulations, while investors seek to mitigate the ESG risks of underperforming food companies and avoid the possibility of stranded assets.
- On the flip side, government funding to promote sustainable food systems through better ecological practices and technical innovation, along with investor interest, have spurred solutions.

MSCI's 2021 [ESG Trends to Watch](#)

This includes a section on 'Unpacking the Soy Value Chain'

Planet Tracker: [Against The Tide: The Japanese Seafood Industry Confronts Nature's Limits](#)

Since 2010, overfishing and other anthropogenic pressures have caused an alarming decline in seafood supply in Japan. Planet Tracker shows that, despite the deterioration of the very resources the industry relies upon, the revenue, profits and market capitalisation of 70 companies listed on the Tokyo Stock Exchange and exposed to seafood have, in fact, grown in the same period. How is this possible?

Planet Tracker debunks the myth that the Japanese seafood industry is thriving, revealing that the apparent financial health of the sector is largely the result of short-term measures to bypass natural constraints – such as foreign expansion, acquisitions, vertical integration, cost-cutting and de-leveraging.

Chain Reaction Research: [JBS, Marfrig, and Minerva: Material Financial Risk from Deforestation in Beef Supply Chains](#)

- The Brazilian cattle industry is dominated by JBS, Marfrig, and Minerva.
- Marfrig, Minerva, and JBS have focused on compliance in direct supply chains, but show little progress on monitoring indirect supply chains.
- The top three's exposure to deforestation is higher in their indirect supply chains than in their direct supply chains, according to CRR's sample.
- The big three's 40-58 percent exposure to debt financing and their 24-32 percent exposure to European financing may lead to (re)financing risks.
- The meatpackers' 11-33 percent exposure of total turnover to China and Europe poses market risks.

'Big data' approaches

PRI [Working Paper on Investor Action on Biodiversity](#)

This report lists four high-level metrics from [CDC](#), [ASN Bank](#), the [IUCN](#) and the [NEC](#), to assess biodiversity risk. The metrics use different methods to estimate the impact of an economic activity on biodiversity and apply this to each company to give an approximate level of risk.

'Rough cut evaluations'

Chain Reaction Research: [TCFD-aligned Framework to Assess Deforestation Risks](#)

This paper presents a framework for assessing deforestation-related risks in agricultural commodity supply chains that is aligned with the TCFD principles. The framework is based on CRR's seven years of experience in the palm oil, soy, beef, and farmland sectors.

- Deforestation is the largest climate change risk in agricultural supply chains. However, companies and investors have not yet fully integrated deforestation risks into their risk management systems

- As the world responds to global climate change and biodiversity loss, companies linked to deforestation may face a range of transition risks
- Zero-deforestation may create economic opportunities for companies within agricultural commodity supply chains
- CRR's analytical framework applies equity-level scenario analysis, CRR assesses the materiality of each identified risk based on income statement and balance sheet metrics

ZSL: [Scrutinizing the World's Most Significant Natural Rubber Producers and Processors](#)

ZSL SPOTT's 2021 natural rubber assessments, scrutinizing the world's most significant natural rubber producers and processors have now been released. This year's assessments saw 15 natural rubber producers, processors and traders assessed against 123 environmental, social and governance (ESG) indicators.

ISS ESG: [Biodiversity – Once it's gone, it's gone!](#)

- A recent survey showed that close to 80% of asset owners and managers are very concerned about biodiversity loss, but feel they lack the data to appropriately act on it.
- ISS ESG's Norm-Based Research service has identified 192 publicly held issuers involved in a controversy where biodiversity loss or deforestation are the main issue, and 30% of them have been assessed as severe or very severe.
- 22% of the issuers with severe or very severe biodiversity or deforestation controversies are in the Food Products industry, reflecting its exposure to biodiversity and deforestation risks.

CDP: [Forests Analysis Report 2020](#)

In 2020, 687 companies reported through CDP on the steps they are taking to eliminate deforestation from their operations and supply chains. This report looks at data disclosed by 553 companies using or producing seven commodities responsible for the majority of agriculture-related deforestation: palm oil, timber products, cattle products, soy, natural rubber, cocoa and coffee.

These companies' current governance, strategies and implementation measures are assessed against a series of industry-accepted measures to reduce deforestation, broken down into 15 Key Performance Indicators (KPIs) and split into six categories. Based on their adoption of the KPIs, companies are also mapped onto a pathway towards deforestation-free markets and a forest-positive future, allowing companies to benchmark against peers and follow in the footsteps of pioneers.

Disclosure regulation and client demand mapping

This approach is in its infancy but we expect it to accelerate as the TNFD and global governments set out their thinking. There have been a number of reports on the types of metrics and reporting which might be used by investors, eg:

- The PRI report mentioned above on [Investor Action on Biodiversity](#)
- The IUCN's [Biodiversity Return on Investment Metric](#)
- The Credit Suisse/Responsible Investor report mentioned above on [Unearthing Investor Action on Biodiversity](#)
- The [investor statement](#) on biodiversity metrics from AXA, BNP Paribas, Mirova and Sycomore
- The Leaders Arena 2021 [study](#) on biodiversity reporting by companies
- The Benchmark for Nature [initiative](#) set up by academia to 'power the development of structured, rigorous, and practically useful frameworks for assessing investor impacts on living nature'

In addition there are various guides for investors on how to invest and engage in line with likely client demand and regulatory requirements.

Hermes EOS: [Our Commitment to Nature](#)

- In a new white paper from EOS – *Our Commitment to Nature* – engager Sonya Likhtman explains why biodiversity is now a stewardship priority. She highlights the value of biodiversity and makes the business case for its protection and restoration. “The mindset of taking nature for granted, and assuming its permanence, must change,” she says.
- The paper outlines our expectations of sectors with high biodiversity impacts and dependencies, which include consumer goods and retail, agrochemicals, mining and materials, oil and gas, utilities, real estate and construction, and finance. With global biodiversity goals expected to be agreed at the UN’s biodiversity COP 15 in 2021, it is critical that national and corporate Covid-19 recovery plans make provisions for biodiversity protection and restoration around the world.

Acclimatise: [Turning the Tide - How to Finance a Sustainable Ocean Recovery](#)

This seminal guidance is a market-first practical toolkit for financial institutions to pivot their activities towards financing a sustainable blue economy.

Designed for banks, insurers and investors, the guidance outlines how to avoid and mitigate environmental and social risks and impacts, as well as highlighting opportunities, when providing capital to companies or projects within the blue economy.

Five key ocean sectors are explored, chosen for their established connection with private finance: seafood, shipping, ports, coastal and marine tourism and marine renewable energy, notably offshore wind.

World Bank: [Pension Fund Investment in Forestry](#)

A forestry investment can include land suitable for growing trees, the trees themselves, or both. Forestry has long provided opportunities for institutional investors but the scope for this investment remains limited. Forestry investment can offer financial and environmental, social, and governance (ESG) benefits. However, challenges to investing in forestry are significant particularly in emerging markets, which is also where reforestation, afforestation, and sustainable forest management is most needed.

Currently, there is a lack of both knowledge about and interest in the forestry asset class. This report addresses this by detailing the nature of forestry investments, explores the case for investing in forestry, explains the mechanics of forestry investments, and highlights some of the challenges. The report concludes that the time is right to support broader involvement by pension plans in forestry investments globally.

Various measures are available to policy makers and the pension-fund industry to enhance the opportunities for pension plan investment in forestry. The report recommends steps which can be taken to encourage more investment in forestry.

FAIRR: [Managing biodiversity and climate risks in aquafeed](#)

The FAIRR Initiative’s global collaborative investor engagement on sustainable aquaculture will encourage the world’s largest salmon companies to develop a strategic, science-based approach to diversify feed ingredient sources to better manage ESG risks associated with sourcing wild forage fish and soy.

The engagement asks eight global salmon companies to develop and disclose strategies to diversify their feed ingredients towards lower impact and more sustainable alternatives to enable production growth, reduce climate risk exposure and ensure risks associated with soy, fishmeal and fish oil sourcing are being adequately managed.

ZSL SPOTT: [Sustainable finance and tropical forestry: a series of financial institution case studies](#)

How do different financial institutions approach non-financial information and ESG issues when considering tropical forestry companies and supply chains exposed to timber, pulp and paper products sourced from tropical regions?

To illustrate the variety of approaches which are available to financial sector stakeholders, ZSL is curating a series of case studies in collaboration with financial institutions.

Each case study focuses on a stakeholder type, from private equity to asset management and banking, or on a different use of ESG information (due diligence and benchmarking, engagement, impact activities). By detailing the rationale for considering the sector from an ESG perspective (climate, biodiversity, local communities and indigenous peoples' rights...) or approaches to integrating disclosures and other ESG information, these case studies will help the reader identify key ESG risks and issues and opportunities to mitigate them in a sector specific fashion.

These case studies are directed at financial sector practitioners and forestry sector stakeholders and aim to promote increased transparency and drive adoption and implementation of best practice on the ground.

Global Canopy: [The Little Book of Investing in Nature](#)

The Little Book of Investing in Nature provides an essential overview of the area of biodiversity finance at a time when governments and international negotiators are urgently seeking pragmatic solutions for the twin crises of climate change and the loss of nature.

Financing the protection for our natural world is a challenge that governments around the world have struggled to meet. Current estimates suggest there is a global shortfall of USD 824 billion. But The Little Book of Investing in Nature provides a simple guide for policy makers and investors as to how this shortfall can be overcome.

UNEP FI: [The Rising Tide: Mapping Ocean Finance for a New Decade](#)

Banks, insurers and investors have a major role to play in financing the transition to a sustainable blue economy, helping to rebuild ocean prosperity and restore biodiversity to the ocean. Through their lending, underwriting and investment activities, as well as their client relationships, financial institutions have the power to accelerate and mainstream the sustainable transition of ocean-linked industries.

The Rising Tide: Mapping Ocean Finance for a New Decade reveals the frameworks and financial instruments that are successfully addressing ocean sustainability and highlights new opportunities and gaps in the market. It looks across five major ocean-linked sectors chosen for their established connection with private finance: seafood, ports, shipping, coastal and marine tourism and marine renewable energy

CISL: [Handbook for Nature-related Financial Risks: Key concepts and a framework for identification](#)

To support financial institutions to identify the specific nature-related financial risks they are facing we created a handbook that:

1. Connects the natural and financial worlds from a risk perspective, explaining key concepts, terms and transmission channels
2. Contains a framework for plotting financial risk exposures

Afterword: On research for engagement purposes

In the analysis above, we have focused on research into biodiversity that is conducted for the purposes of investment decision-making, client reporting or regulatory reporting.

As a result, we have focused on angles that are likely to be financially-material or research that is likely to identify significant risk exposures for investors.

We recognise, however, that within the wider sustainable investment ecosystem, there are a number of investors that 'engage' with companies based on primarily a moral mandate (where the investment case for action by the company is immaterial).

In the case of biodiversity and the nature crisis, there is a strong moral case to be made for such engagement - to prevent a 'tragedy of the commons' and there will also be a market for research into biodiversity that supports morally-driven engagement.

It will be helpful for investors and the wider market if these two types of research are clearly differentiated.