TNFD PILOT TEST
AGRIFOOD INDUSTRY

Taskforce on Nature-related Financial Disclosures

FINAL REPORT

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EXECUTIVE SUMMARY

- **The global food system is the primary driver of biodiversity loss, highlighting the urgent need to change the way in which food is produced and consumed today**. As result, four financial institutions[1], along with I Care and Iceberg Data Lab (IDL), partnered together to conduct a Taskforce on Nature-related Financial Disclosures (TNFD) pilot on the agri-food sector with a sample of 123 companies operating globally.
- **Beyond addressing nature loss, this TNFD pilot also sought to assess financial institutions' ability to both report and act collectively on biodiversity**. This pilot tested both the application of the beta version of the TNFD Framework and V-Process, supplemented with a quantitative biodiversity footprint and dependency indicators developed by IDL.
- **This pilot demonstrated that it is possible to identify potential impacts, dependencies, risks and opportunities (IDROs) for the agri-food sector, to some extent for direct and/or indirect activities**. Pilot results demonstrated that potential IDROs across the sample portfolio were not the same within the agri-food industry itself and the full food value chain (food production versus food retail), as well as specific subsectors, such as meat-, dairy- and cereal-based production.
- **On the sample portfolio, the negative impacts on biodiversity overwhelming stemmed from the agri-food's supply chain (upstream scope 3 activities – indirect activities)**. This means that a full value chain approach to measuring biodiversity impacts needs to be adopted as the "direct" impact of these sampled companies remained relatively low compared to their indirect impacts coming from the sourcing of key inputs/products.
- **The mapping of dependencies, and to some extent risks, on the sample portfolio proved to be more difficult relative to the impact assessment.** At company level, the impact analysis appeared more robust than the dependency analysis given the nascent nature of dependency methodologies (e.g., ENCORE[2] - direct impacts only). However, a specific 'agri-food' risk mapping exercise was conducted by combining underlying CBF data with open-source geographical databases to identify transition and physical risks related to deforestation, overfishing and water use.
- **Financial institutions can play a role in helping transform the agri-food industry in favor of nature by supporting their clients towards sustainable food**

[1] BNP Paribas, Crédit Agricole S.A., Mirova and SCOR

[2] ENCORE (Exploring Natural Capital Opportunities, Risks and Exposure) is a tool that helps users to better understand and visualise the impact of environmental change on the economy as well as businesses' dependencies on ecosystem services.

production. The following opportunities were identified based on three levers of change: scaling up agroecology and other sustainable agricultural practices, shifting consumption patterns and diets, reducing food waste and resource consumption. For each lever, a list of practices and illustrative indicators was provided based on business activity.

- **However, there are limits to the quantification of IRDOs and application of the TNFD framework given the lack of available localized and supply chain data, commonly accepted global metrics and scenarios on nature and biodiversity**. While this pilot demonstrated that it is possible to identify potential IRDOs, further pilots will be needed on other sectors and types of companies (e.g., SMEs or private companies), as this pilot represented a small sample of the four financial institutions' portfolio and the overall food value chain.
- **The CBF and dependency scores are powerful tools but limited to data available in the public domain, as well as the assumptions made behind their models**. While the roll out of the Corporate Sustainability Reporting Directive (CSRD) should help address this data challenge in Europe, the localization of *production sites* will remain a challenge globally. Sectoral guidance is awaited from the TNFD to have common approach and enable comparability across future nature-related disclosures internationally.
- **Lastly, the transition towards a more sustainable food system will not be possible without support from governments worldwide, in a similar vein to the clean energy transition**. A collective effort between the private and public sectors will be essential to transform the global food system as financial institutions alone will not be able to effect this change. All actors involved in the 'biodiversity and nature' space, including the TNFD, have vital role to play to encourage nature-related disclosures, as well as develop common methodologies, indicators, target-setting approaches on biodiversity and robust nature-related scenarios based on the best available science.

A. PURPOSE AND SCOPE OF THE PILOT TEST

1. Overarching goal

This pilot test sought to evaluate the usefulness of **quantitative dataset provided by Iceberg Data Lab for financial institutions to report and act on their biodiversity-related risks and opportunities,** according to two existing frameworks:

- The **V-Process**, whose full guide was published in December 2022 by the Finance for Biodiversity Pledge[3]
- The **LEAP-FI approach**, which forms the core of the Taskforce on Natural-related Financial Disclosure (**TNFD**), currently being developed.

The profile of the participants varied with one reinsurer, two credit institutions and one asset manager.

The pilot test more specifically aimed at:

- Identify **which conclusions could be drawn based on the data provided by Iceberg Data Lab (IDL)**
- Highlighting relevant **takeaways** for the four participating financial institutions as well as for I Care and IDL
- Providing **feedback** to the TNFD within the open-innovation process.

2. Methodological framework

The methodology followed the main steps of both LEAP-FI (Locate, Evaluate, Assess, and Prepare – Financial Institutions) and the V-Process, which **were considered similar in terms of identification and analysis of impacts, dependencies, risks, and opportunities**. In order to facilitate the reader's understanding, the structure of the pilot matches LEAP-FI's wording.

The LEAP-FI approach includes a set of **scoping questions** that help to determine whether to start at the Locate or at the Evaluate phase. According to the TNFD, "listed and unlisted equity and debt (…) are more likely to take a sector-focused approach and may therefore find it more appropriate to start their LEAP assessment with the 'Evaluate' phase"[4]

LEAP-FI is built as follows:

[3] https://www.financeforbiodiversity.org/publications/act-now-the-why-and-how-of-biodiversity-integration-by-financial-institutions/

[4] https://framework.tnfd.global/wp-content/uploads/2022/06/TNFD-Framework-Document-Beta-v0-2.pdf

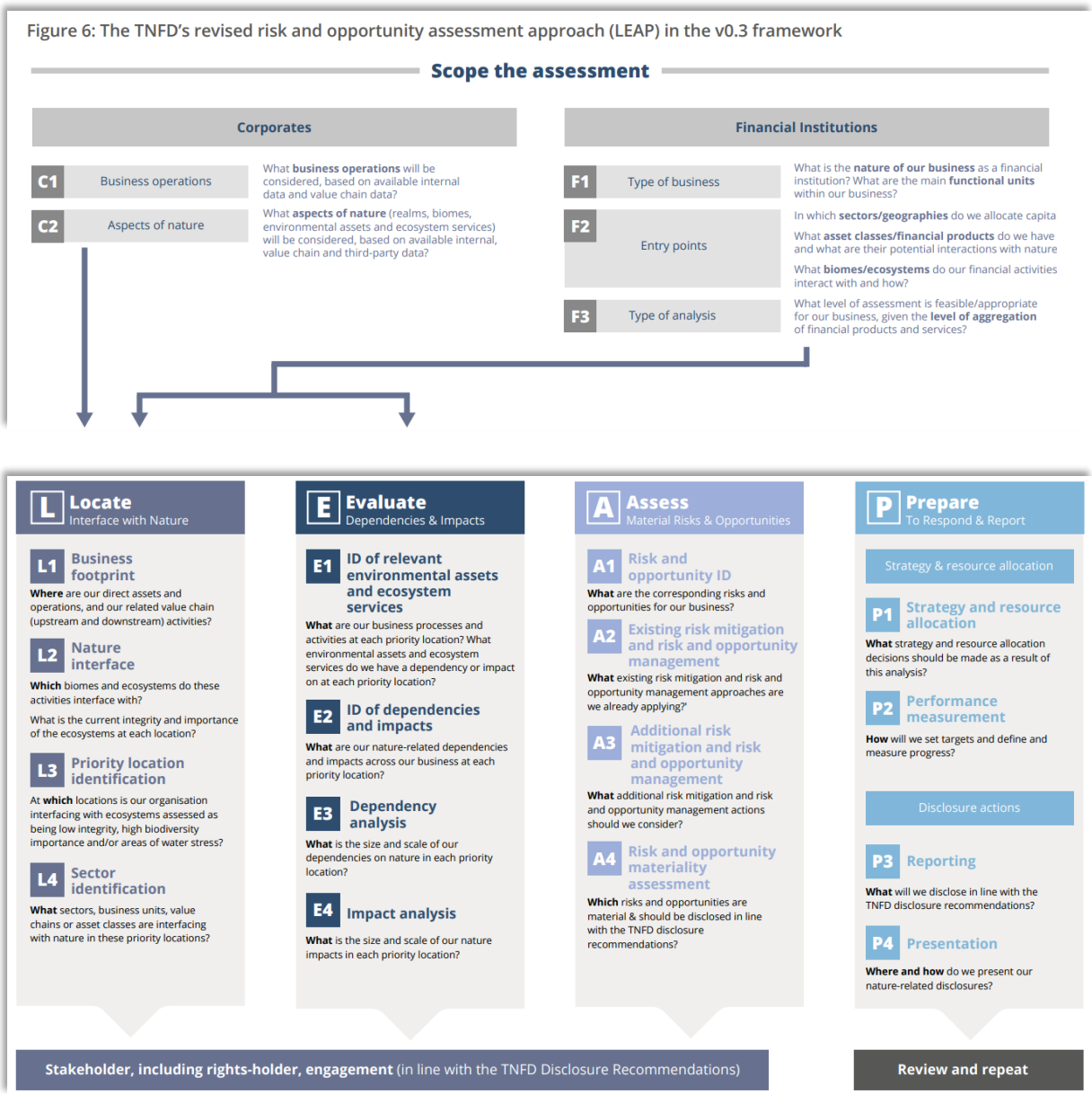


Figure 1. The TNFD Nature-related Risk and Opportunity Management and Disclosure Framework Beta v0.3 - The LEAP-FI Approach

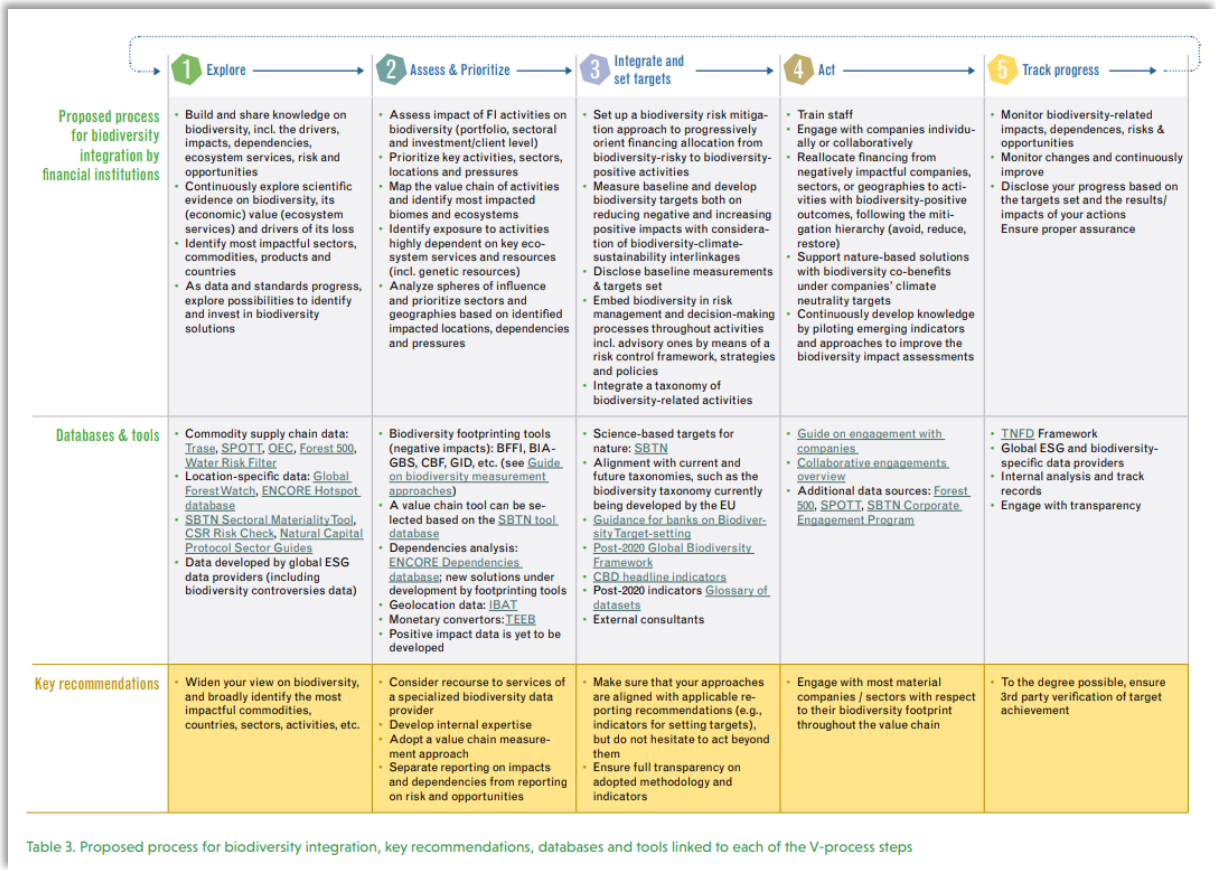
The V-Process framework, laid out in detail in the guide entitled "'Act now! The why and how of biodiversity integration by financial institutions", which has been developed to suit the special needs of financial institutions, differs from the LEAP-FI approach on the following aspects:

- Localization does not sit at the heart of its methodology. Instead, it adopts a more **pragmatic approach**, highlighting the **existing tools and material** available to FIs to screen their impacts, dependencies, risks, and opportunities.

- **Biodiversity footprint and localization** come at a later stage when having an accurate picture of impacts and dependencies is needed. Country-based data can be obtained through **Iceberg Data Lab**'s use of the **Corporate Biodiversity**

Footprint (CBF), which provides information on commodities used by the invested companies, associated with their country of production[5]. We calculate a company's direct biodiversity impact (Scope 1), the impact of its electricity suppliers (scope 2) and its upstream and downstream impacts (Scope 3), adopting the taxonomy of the GHG protocol.

- The V-Process stresses the importance of contributing to halt the loss of biodiversity by **avoiding and reducing negative impacts** as well as **identifying positive impact opportunities**. It is **in line with the SBTN** (Science Based Target Network) mitigation hierarchy (AR^{3}T) as well as with the proposed "Guidance on evaluating impact mitigation and positive impacts", put forward in **TNFD beta framework 0.3**.



	1 Explore	2 Assess & Prioritize	3 Integrate and set targets	4 Act	5 Track progress
Proposed process for biodiversity integration by financial institutions	• Build and share knowledge on biodiversity, incl. the drivers, impacts, dependencies, ecosystem services, risk and opportunities • Continuously explore scientific evidence on biodiversity, its (economic) value (ecosystem services) and drivers of its loss • Identify most impactful sectors, commodities, products and countries • As data and standards progress, explore possibilities to identify and invest in biodiversity solutions	• Assess impact of FI activities on biodiversity (portfolio, sectoral and investment/client level) • Prioritize key activities, sectors, locations and pressures • Map the value chain of activities and identify most impacted biomes and ecosystems • Identify exposure to activities highly dependent on key ecosystem services and resources (incl. genetic resources) • Analyze spheres of influence and prioritize sectors and geographies based on identified impacted locations, dependencies and pressures	• Set up a biodiversity risk mitigation approach to progressively orient financing allocation from biodiversity-risky to biodiversity-positive activities • Measure baseline and develop biodiversity targets both on reducing negative and increasing positive impacts with consideration of biodiversity-climate-sustainability interlinkages • Disclose baseline measurements & targets set • Embed biodiversity in risk management and decision-making processes throughout activities incl. advisory ones by means of a risk control framework, strategies and policies • Integrate a taxonomy of biodiversity-related activities	• Train staff • Engage with companies individually or collaboratively • Reallocate financing from negatively impactful companies, sectors, or geographies to activities with biodiversity-positive outcomes, following the mitigation hierarchy (avoid, reduce, restore) • Support nature-based solutions with biodiversity co-benefits under companies' climate neutrality targets • Continuously develop knowledge by piloting emerging indicators and approaches to improve the biodiversity impact assessments	• Monitor biodiversity-related impacts, dependences, risks & opportunities • Monitor changes and continuously improve • Disclose your progress based on the targets set and the results/ impacts of your actions Ensure proper assurance
Databases & tools	• Commodity supply chain data: Trase, SPOTT, OEC, Forest 500, Water Risk Filter • Location-specific data: Global Forest Watch, ENCORE Hotspot database • SBTN Sectoral Materiality Tool, CSR Risk Check, Natural Capital Protocol Sector Guides • Data developed by global ESG data providers (including biodiversity controversies data)	• Biodiversity footprinting tools (negative impacts): BFFI, BIA-GBS, CBF, GID, etc. (see Guide on biodiversity measurement approaches) • A value chain tool can be selected based on the SBTN tool database • Dependencies analysis: ENCORE Dependencies database; new solutions under development by footprinting tools • Geolocation data: IBAT • Monetary convertors: TEEB • Positive impact data is yet to be developed	• Science-based targets for nature: SBTN • Alignment with current and future taxonomies, such as the biodiversity taxonomy currently being developed by the EU • Guidance for banks on Biodiversity Target-setting • Post-2020 Global Biodiversity Framework • CBD headline indicators • Post-2020 indicators Glossary of datasets • External consultants	• Guide on engagement with companies • Collaborative engagements overview • Additional data sources: Forest 500, SPOTT, SBTN Corporate Engagement Program	• TNFD Framework • Global ESG and biodiversity-specific data providers • Internal analysis and track records • Engage with transparency
Key recommendations	• Widen your view on biodiversity, and broadly identify the most impactful commodities, countries, sectors, activities, etc.	• Consider recourse to services of a specialized biodiversity data provider • Develop internal expertise • Adopt a value chain measurement approach • Separate reporting on impacts and dependencies from reporting on risk and opportunities	• Make sure that your approaches are aligned with applicable reporting recommendations (e.g., indicators for setting targets), but do not hesitate to act beyond them • Ensure full transparency on adopted methodology and indicators	• Engage with most material companies / sectors with respect to their biodiversity footprint throughout the value chain	• To the degree possible, ensure 3rd party verification of target achievement

Table 3. Proposed process for biodiversity integration, key recommendations, databases and tools linked to each of the V-process steps

Figure 2. The V-Process as detailed in the "Act now! The why and how of biodiversity integration by financial institutions" guide

[5] The Corporate Biodiversity Footprint provides two kinds of geographical information: the country of revenues of the company, and the countries of production of the commodities in the value chain of the company. The last is used in this section.

These three elements have consequently been added to the methodology. Therefore, the pilot starts at the Evaluate phase, while localization is part of impact analysis.

3. Agri-food Company Sample

The global sample is composed **of 123 companies**, all operating in the **agrifood industry**, selected by Iceberg Data Lab.

Although the sample covers only part of the financial institutions' assets, it allows us to test the relevance of both the data and the framework to assess risks & opportunities.

The agrifood industry has been chosen because it has been identified as one of the **priority sectors regarding biodiversity loss due to both its impacts and dependencies**. The impacts are caused by several pressures, of which predominantly land use change, which can be found all along the value chain and originate in the **upstream agricultural activities** and the breeding of animals.

The agrifood industry was **divided into several subsectors** using NACE codes, to allow for **a fine-tuned analysis**. These subindustries are:

- **Growing of crops, fruits and vegetables**, including farmers or any direct producers of vegetal commodities;
- **Animal farming**, including direct producer of cattle, pig, or chicken meat;
- **Food service activities**, including restaurants, caterers, and fast-foods;
- **Food manufacturing**, including any industrial producing processed food products such as beverages, pastries, diary…;
- **Wholesale**, as commonly defined by NACE;
- **Retail**, as commonly defined by NACE;
- **Agrochemicals**, including industrials producing pesticides, fertilizers, edible flavors, or any product related to chemicals;
- **Not food-related**, including any activities not related to the food industry and above sectors.

For each of these subindustries, a sectoral impacts, dependencies, and risks assessment was carried out.

4. Our approach to localization

The pilot test made use of the full **flexibility** offered by both LEAP-FI and the V-Process

While the V-Process does not make localization a prerequisite for action, LEAP-FI recognizes that financial institutions owning listed equities and general-purpose debt could start at the "**Evaluate**" phase.

The lack of **readily available localized data** and **the need for capacity-building** is the reason why we started our pilot test at the impact and dependency analysis step.

5. Processes and components left out of the scope

Although recommended both by the TNFD and the Finance for Biodiversity Foundation, considering the complexity and uncertainties of biodiversity, no use was made of **scenario analysis** for the following reasons:

- Consensual biodiversity scenarios do not yet exist
- As acknowledged by the TNFD, scenario analysis requires both **time** and **resources** while many **challenges** have yet to be overcome, including location-specificity, scientific uncertainty, data, and modelling limitations, etc.

The same goes for **systemic risks**: existing tools, complexity and required resources led us not to include them in the risk assessment phase.

We also did not assess the eligible or aligned part of investments with the **EU taxonomy as recommended by V-Process**.

The following figure gives a clearer picture of the gap analysis between the pilot test and both the LEAP-FI and V-Process frameworks.

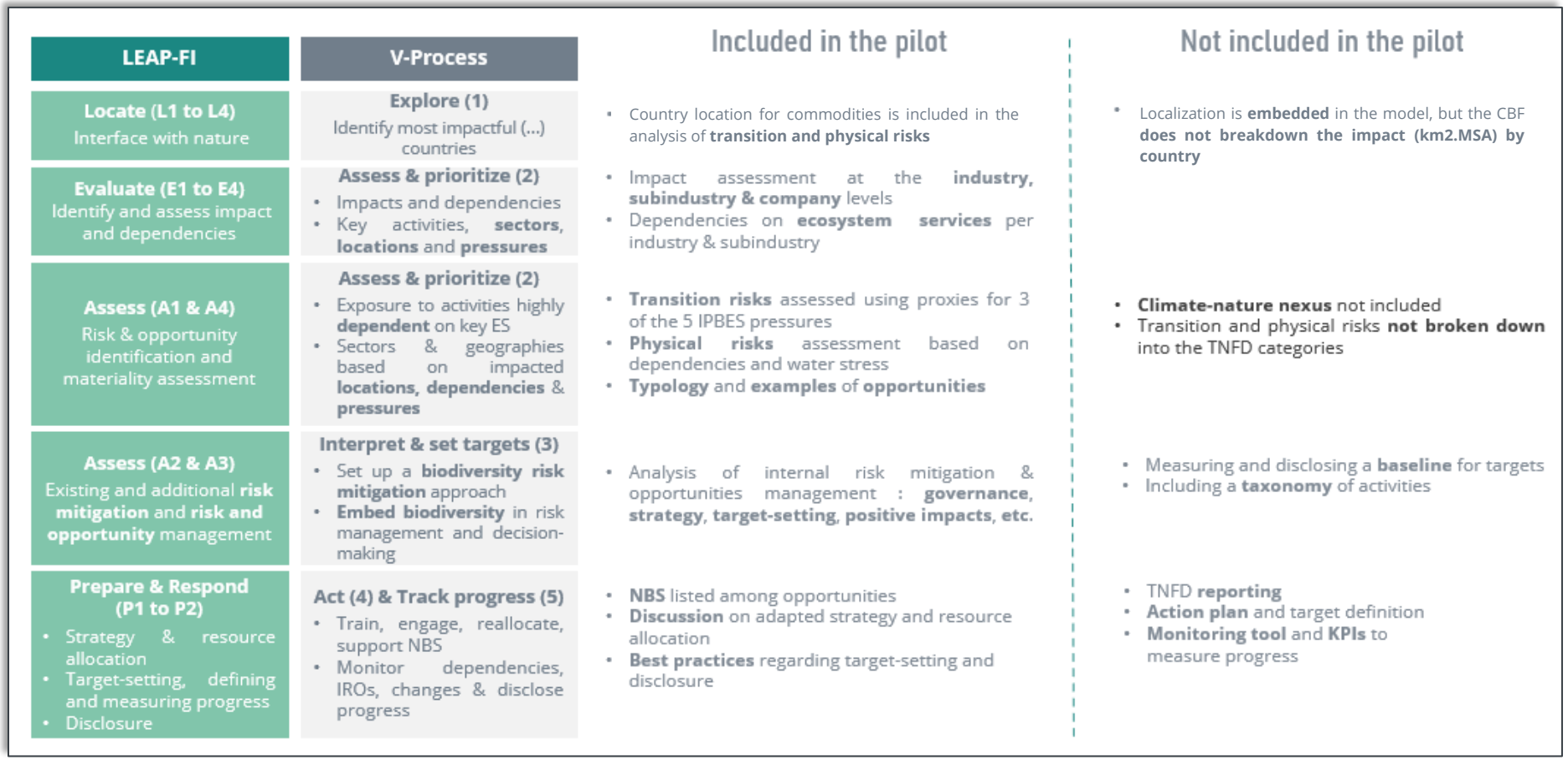


Figure 3. Gap analysis between the pilot, LEAP-FI and V-Process frameworks

B. METHODOLOGY

1. Impact analysis

Impact analysis was performed using the **Corporate Biodiversity Footprint** (CBF) tool and the **km2.MSA indicator, as illustrated in** Figure 4**.** The CBF measures **potential** and not actual impact. It is a static model, updated regularly as new data becomes publicly available.

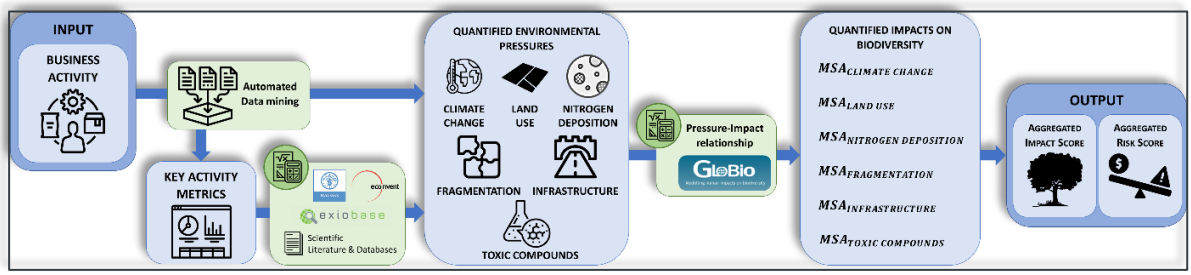


Figure 4. CBF detailed methodology.

The **five main direct pressures identified by the IPBES**[6] are by order of priority: land and sea use changes, direct exploitation of organisms, climate change, pollution and invasion of non-native species. The **CBF** covers three of these: **land use change, pollution (water pollution and air pollution) and climate change**. More specifically, the CBF covers:

- Land use and land use change: The land use pressure as defined by Iceberg Data Lab corresponds to the land use and use change defined by the IPBES in the 2019 Global Assessment report[7], i.e., the fact to change the use of the land compared to its natural state, with several intensity in the change and the use of it (agricultural, residential, industrial, etc.
- Air pollution, covering terrestrial acidification and eutrophication impacts linked to Sox and Nox emissions.
- Water pollution, covering the biodiversity loss in freshwater ecosystems caused by the release of organic or inorganic chemicals into environment by companies; it does not cover yet the impacts of freshwater eutrophication.
- Climate change, covering all main GHGs.

[6] IPBES : Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services

[7] IPBES, « Global Assessment Report on Biodiversity and Ecosystem Services of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services » (Zenodo, 4 mai 2019), https://doi.org/10.5281/zenodo.6417333.

Soil pollution is partially approximated by water pollution, since most pollutants released on terrestrial ecosystems are considered leaching into water bodies – at different speed. And the long-term impacts of local soil pollutions are also accounted for in the CBF through land use.

The CBF does not cover impacts on the marine environment yet.

Results are expressed in km^2.MSA. **Mean Species Abundance (MSA)** in an ecosystem compared to their abundance in undisturbed ecosystems. If impacts are computed along value chains (including direct and indirect impacts of activities) according to Iceberg Data Lab's methodology, one must bear in mind that there are some methodological hypotheses made and limits to the complete "value chain" approach. For example, impacts of the use of agro-equipments are including fuel or electricity consumptions but no land cultivation (and thus change of land use impacts).

Results disclosed below are presented as rebased to 100, as it is preferred to disclose the order of magnitude of each company or sub-sector relative to each other rather than precise MSA.km^2 both for clarity reasons and future methodology evolution.

This new indicator will continue to evolve in the course of next years as more data becomes available via the CSRD.

The **CBF/Turnover** (expressed in MSA.km^2/Mn€) is dependent on the price of commodities. Its value tends to be relatively lower for high-price commodities (e.g., meat). Likewise, CBF/Turnover for cheaper commodities, such as grains, tend to be relatively higher.

Data is provided by Iceberg Data Lab. Each impact measure is associated to a **Data Quality Level** (DQL).

The DQL shows the **input used for the calculation** and therefore the degree of uncertainty of the result. Four levels of input data quality are available:

- **Environmental data** reported by companies are considered as best (DQL of 1)
- If no environmental data are not reported, **consumption and production** data are used to model environmental pressures (DQL of 2).
- If only **sales** are reported, the volumes are modelled using our customized Input/Output model (DQL of 3).
- When no data is available, a biodiversity footprint is modelled from **sectoral average** (DQL of 4)

The aim of using the biodiversity footprint method is to identify the **most impactful subindustries and companies operating within the same industry (agribusiness)**.

Corporates are ranked along their Corporate Biodiversity Footprint **relative to a financial ratio**:

- **CBF/Turnover** (expressed in MSA.km²/Mn€), was used in order to spot the companies that are the most impactful relative to their sales. The turnover will be used instead of capital employed for non-listed companies that do not disclose their amount of equity.
- **CBF/Capital Employed** or **CBF/Enterprise value** (expressed in MSA.km²/Mn€). The capital employed is calculated by IDL and corresponds to the addition of a shareholder's equity and long-term liabilities. The Enterprise value was sourced from Reuters and represents the company's equity value and total net debt (long and short-term debt and debt like instruments minus its cash and cash equivalents). These indicators allow us to compare companies that have different capitalistic intensities. It assesses the additional biodiversity loss per million Euros of additional capital used by the company.

Impact data has been **weighted** by company and subsector in order to reflect the actual exposure of a given portfolio. A **qualitative explanation** of the most impactful subsectors is given (details of included activities in the subsector, reasons for impact, identification of main impact drivers of the subsector, most impactful practices that can be found in this subsector, etc.).

Each company of the sample was categorized in one subindustry only, according to its highest share of turnover. The companies classified in the "food manufacturing" subsector were also associated to one commodity only according to the same parameter.

2. Dependency analysis

Iceberg Data Lab dependency scores were used to assess dependencies to ecosystem services. Based on **ENCORE** data**, IDL** has developed a method to identify and qualify a company's priority dependencies towards ecosystem services.

Dependencies on the three following ecosystem services were assessed:

- Provisioning
- Regulating
- Cultural

The results were **calculated at the company level, considering all its sub-sectors of activity.** Therefore, the score is only related to the distribution of the companys turnover by sub-sector of activity, and not to its sales volume. Scores range between 0 and 100, with **most values scoring between 0 and 50** (0 means no direct dependency on the 3 types of ecosystem services assessed, 100 means total dependency).

The dependency scores cover only **direct dependencies** (scope 1). The assessment was based on **ENCORE** data and **expert opinion**.

We complemented the analysis with a **qualitative explanation** of the most dependent companies. Subindustries and companies belonging to a same subindustry were assessed and compared.

Dependency analysis is not as thorough as biodiversity footprinting, in particular when it comes to the agrifood industry, notably because:

- Only direct (Scope 1) dependencies are assessed at this stage: all downstream actors of the agrifood value chain are thus not relying on ecosystem services necessary for agricultural production;
- Dependencies are not yet localised by ENCORE & Iceberg Data Lab
- Agriculture is **heavily reliant on water** and ENCORE contains many **water-related ecosystem services**. As a result, the differences between companies are quite reduced, especially when looking at provisioning ecosystem services.

Yet, **the dependency score gives an order of magnitude**, allowing for:

- **Comparisons between economic sectors** and **between companies** belonging to a same sub-industry;
- **Monitoring progress** of a given company over time.

3. Risk analysis

The following method was followed to assess physical and transition risks :

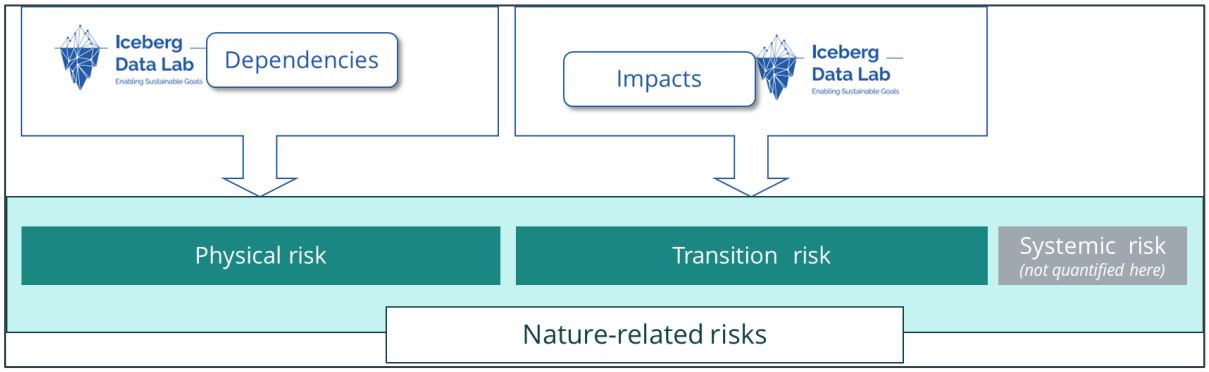


Figure 5. Risk analysis methodology

a) Transition risks

We used **deforestation, overfishing** and **water pollution** to evaluate the three following **main direct drivers of biodiversity loss** identified by the 2019 IPBES assessment[8] :

- Land use change
- Direct exploitation of organisms
- Pollution

The two remaining pressures are out of scope of our analysis: climate change transition risks can already be assessed via existing frameworks and methods and no metric currently exists for alien invasive species.

These proxies seemed all the more suited since the **Kunming-Montreal Global Biodiversity Framework**, agreed during COP15, defined ambitious goals with regards to those proxies:

- Reduce risk from pesticides by at least 50% by 2030
- Reduce pollution risks and negative impacts of pollution from all sources by 2030
- Stop the extinction of known species, and by 2050 reduce tenfold the extinction risk and rate of all species
- Restore 30% of degraded ecosystems globally (on land and sea) by 2030
- Sustainably manage areas under agriculture, aquaculture, fisheries, and forestry and substantially increase agroecology

For the analysis of **deforestation-related transition risks**, we analysed the consumption (in tons) of all portfolio's companies regarding the **seven commodities** (soy, cattle, cocoa, coffee, palm oil, rubber and wood fiber) responsible for 57% of **agriculture-related forest loss** between 2001 and 2015 according to WRI's Global Forest Review[9]. Companies were analysed in detail only if one of these commodities represented a significant quantity or impact of its total inputs (more than 3% of company's total agrifood inputs or more than 3% of a company's total CBF).

The country of production has also been considered for each at-risk commodity, to **highlight companies with a high consumption of at-risk commodities in at-risk countries** such as defined by the WWF in its deforestation[10] report.

[8] IPBES, Global Assessment Report on Biodiversity and Ecosystem Services, 2019

[10] https://wwf.panda.org/discover/our_focus/forests_practice/deforestation_fronts_/

Only direct inputs, or tier one, were considered such as cattle meat or palm oil. Indirect inputs, such as commodities used to feed the cattle upstream, were not included in the data.

For each company and portfolio, **we assigned a qualitative level of risk (low, medium, or high) based on**:

- **Absolute amount of input** (tons);
- **Relative** share of inputs and impacts;
- As pointed out by the pilot test on palm oil led by Global Canopy, the **Carbon Disclosure Project (CDP) Forest questionnaire** was helpful when it came to assigning a qualitative grade

Overfishing is used to evaluate transition risks as fish species are overexploited or exploited at their maximum sustainable yield. Companies therefore face reputation risks, legal risks (illegal, unreported and unregulated fishing), market risk (decline in public subsidies, need to change suppliers, etc.) and technology (new and sustainable ways of producing fish emerge, for instance sustainable aquaculture). Companies and portfolios were assessed based the absolute quantities and the relative share of fish products used as input (no distinction was made between species), and the share of portfolio companies linked to the proxy.

Regarding pollution, companies were assessed based on their absolute and relative impact (km2.MSA) due to water pollution.

b) Physical risks

To analyse physical risks, a **first-level analysis regarding water-stress** and a **default analysis of physical risks linked to the state of ecosystem services** were conducted**.**

The most important ecosystem services were identified at each portfolio level. We extracted their state at a global scale from the IPBES 2019 Global Assessment.

To assess exposure to **water-stress-related physical risks**, we identified the most water-consuming commodities (> 5,000 m^3 / ton), according to the Water Footprint Network[11], in countries whose water-stress level is ranked from medium to extremely high by the WRI Aqueduct Country Ranking[12].

[11] https://waterfootprint.org/en/resources/waterstat/product-water-footprint-statistics/

[12] https://www.wri.org/data/aqueduct-30-country-rankings

For each company and portfolio, we assigned a qualitative risk level based on:

- Absolute and relative quantity of the commodities consumed;
- Level of water-consumption of the commodities consumed;
- Level of water-stress of the country of production of the commodities consumed;

We also used the **CDP Water questionnaire** and looked at both the grade and the answers regarding water stress provided by companies.

4. Opportunities

The TNFD defines nature-related opportunities as activities that create **positive outcomes** for organizations and nature by creating positive impact on nature or **mitigating negative impacts** on nature.

We listed opportunities through **three main levers of change**[13] as part of supply and demand in the agrifood industry, that influence each other:

- Redesigning existing agroecosystems (supply) towards less impacting practices involving changes to agricultural ecosystems to improve sustainability and resilience (e.g., reducing the use of pesticides and fertilizers, improving soil health, and using sustainable livestock practices.
- Reduction of food waste and resources used and change in consumption patterns and diets (demand), meaning the shift of consumer expectations and habits (e.g., vegetarian diet) toward less impacting products.

5. Risk mitigation & risk and opportunity management

The existing risk and opportunity management of the four financial institutions was assessed using our **in-house analysis grid** for financial institutions, which is **based on international standards and regulations.**

The latter is **to a large extent aligned** with the recommendations put forward by both the LEAP-FI approach and the V-Process.

Data was collected through questionnaires and public reports. After reviewing the answers, a qualitative grade evaluating **the participant's maturity on risk management** was given according to the following criteria:

- High for best practices in the market and/or among other participants;
- Medium for several good practices or initiatives to be reinforced, systematized, or deployed to a larger scale;
- Low for little or no practices in place.

[13] HEC Paris, Biodiversity : a call for a decisive action, 2022, p.82

Recommendations were made to the participants, according to the results of the risk & opportunity assessment on their sample portfolio (agrifood only) and their level of maturity on the above risk & opportunity management analysis at group level.

C. Global Results on Iceberg Data Lab sample of 123 companies

1. Impact analysis

Results show that the biodiversity impact of the portfolio come primarily **mainly Scope 3 upstream (see Figure 6).**

The land use pressure (upstream scope 3 and scope 1) accounts **for the large majority of the global sample's total impact.** As the sample here focuses on agricultural value chains, it is no surprise to see the land use pressure as the most contributing to the total impact. It relates notably to the fact that:

- Agriculture is contributing to deforestation (change of land use) on several deforestation front to expand both pasture lands and crop fields;
- Agricultural land under a conventional exploitation model has a very poor level of on-field biodiversity (because of many practices, among which monoculture, tillage, use of pesticides, fungicides, reparcelling, standardisation of cultivated species, etc.);
- Most production in the sample are depending on a conventional farming model.

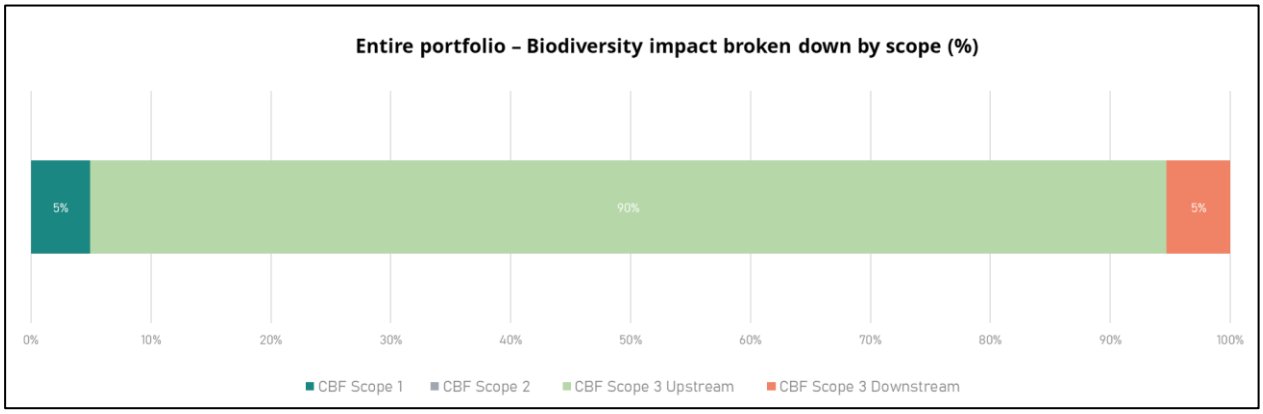


Figure 6. Biodiversity impacts broken down by scope on IDL's sample portfolio of 123 agribusiness companies

Regarding the **average CBF per sector,** results show that **the closer an activity is from the upstream food value chain, the higher the impact of a million euro of turnover on biodiversity**. For instance, a farmer will have both a higher direct and overall impact, mainly through its scope 1, than a retailer whose impact originates from further up its value chain (scope 3 upstream). As a matter of fact, in the agrifood value chain, most significant impacts originate "at field"' (related to land use change, pollution and climate change), whereas transformers, wholesalers and retailers have a quite limited scope 1 impact (related mostly to occupation of the land of industrial plants, shops and energy

consumption and transportation). As a consequence, walking down the value chain, the added value increases more than the biodiversity impact, and hence the biodiversity impact intensity (per million euro turnover) decreases.

Agro-chemicals have the higher global biodiversity impact per turnover due to the high impact caused by **water pollution** (that covers impacts linked to freshwater ecotoxicity, but does not include impacts linked to plastics pollution and eutrophication)**.**

If we look at commodity-related subindustries for food manufacturers, the most impacting companies have activities related to **meat** and **cereals (see** Figure 7**).** Their higher impact is explained as follows:

- The **meat industry** has a high impact on biodiversity, first because of the surface dedicated to their feeding (especially when animals are fed with other resources than pastured grass, and when the pastures or field crop land are previously deforested lands), because of the water needs of animals, and because of the risk of nutrients' excess and release into the environment
- **Cereals** also show high up on the comparison because activities are classified by **turnover intensity**. Since cereals are on average relatively cheaper than other commodities, each million euro turnover of cereals production correspond to very large occupied surface for production, making their impact per million euro of turnover high.
- The rank of the **fish industry** among others does not a priori reflect the reality. Indeed, the fish industry stands among the most contributing to the pressure of overexploitation of species – a pressure not quantified by the CBF due to limits in data and scientific knowledge coverage. The ranking here should then be considered very carefully.

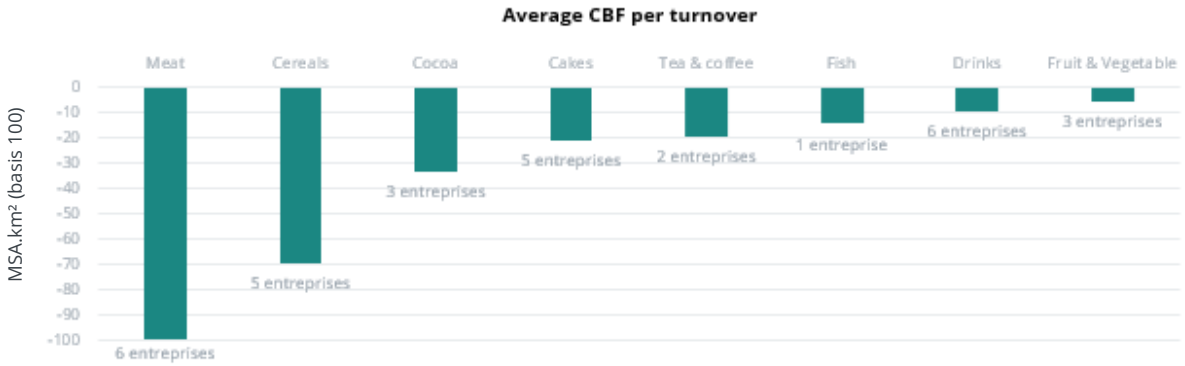


Figure 7. Impact per turnover intensity of companies belonging to the « food manufacture » industry - Global sample

2. Dependency analysis

Results of the dependency analysis show that most dependent activities are linked to **animal farming** (pigs, poultry, fish, cattle). On average, the dependency score of the whole sample is 16 points (out of 100, although most companies in the total IDL universe are scoring below 50). The split among the different types of ecosystem services is disclosed on Figure 9. The maximum dependency score of the portfolio is 40 pts (animal-products companies), the lowest is 3 pts (services companies).

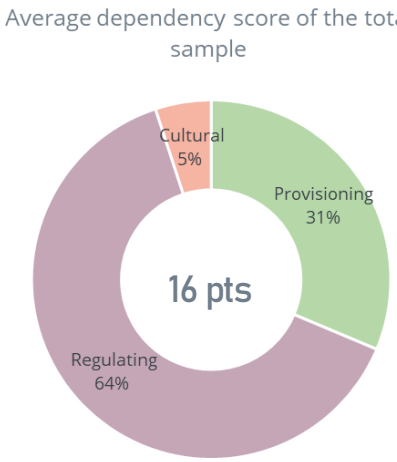


Figure 8. Average split of types of dependencies for the whole sample - and average dependency score.

When looking at the detail of dependencies per type of dependency (provisioning, regulating, cultural), Figure 9 shows the contribution of each ecosystem service to the average dependency score:

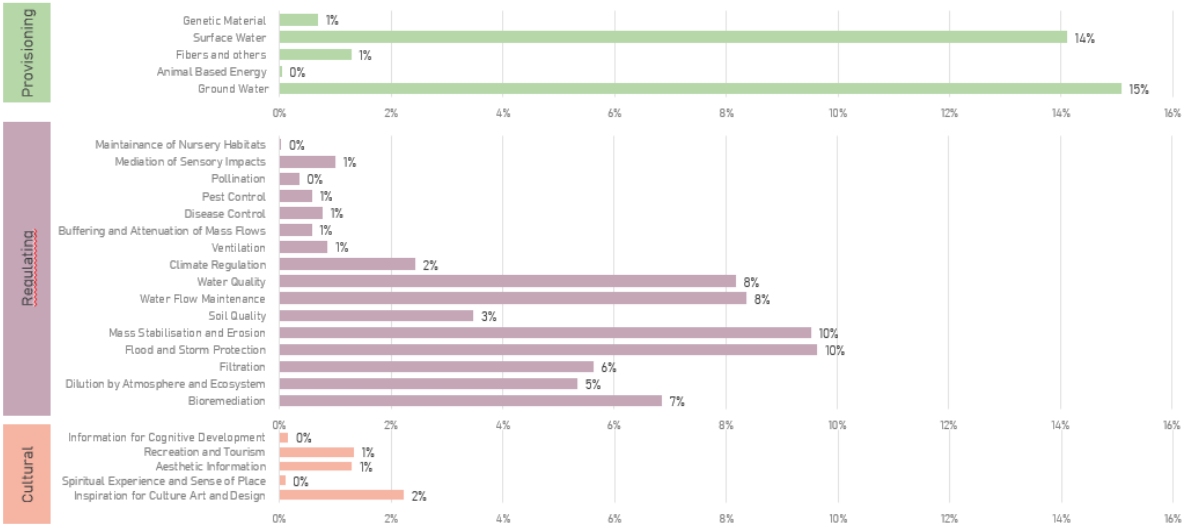


Figure 9. Average contribution of each ecosystem service to the dependency score of the sample

The analysis of Figure 8 and 9 reveals that although the sample is globally more dependent on regulating services (through a quite large variety of services, like flood and storm protection, mass stabilisation and erosion control, water flow maintenance and water quality), the dependence on provisioning services is quite acute, through ground

and surface water provisioning. In fact, water-related dependencies are important, and this appears quite logic considering the agrifood focus of the sample (water is essential to grow food).

When taking a closer look at dependencies, it emerges that:

- **Ground water** and **surface water** are the two ecosystem services on which the sample is the most dependent (resp. 15% and 14% of the total dependency score of the portfolio). They are both provisioning services.
- Flood and storm protection, mass stabilization, water flow maintenance and water quality are secondly important (resp.10%, 10%, 8%, 8% of the total dependency score of the portfolio). They are all regulating services.

3. Transition risks

As explained in the methodology section, we use deforestation, overfishing and water pollution as proxies for the three following main direct drivers of biodiversity loss identified by the 2019 IPBES assessment, that is respectively land use change, overexploitation of natural resources and pollution. The proxies are exposed to all four transition risks as defined by the TNFD: market, legal/policy, technology and reputation.

a) Deforestation-related transition risks

The overall exposure of the portfolio's sample – that is the share of companies using inputs both linked to deforestation and sourced in countries facing deforestation – was measured for **the four financial institutions.** The level of risk was deemed low or medium.

Out of the four participants' portfolio samples, **nearly half** of the total companies sources deforestation-linked inputs in countries facing risks of deforestation, with part of them **using large or very large quantities** of the seven identified commodities. **A handful were deemed, as a company, highly exposed** after applying the methodology detailed in the first part of the report (absolute amount and relative share of both inputs and impact, CDP grade and responses).

Commodities that stood out the most were **cocoa beans, palm oil, soy, and products of meat cattle**. **West African countries** (Ghana and Ivory Coast especially) were often related to cocoa beans. Palm oil was often associated with **Indonesia** while products of meat cattle were more commonly sourced in **Brazil**. The localization of soy was more varied.

Portfolio company	Commodity/country	CDP Forests grade	Company risk level
European food & beverage company	• **Cocoa beans** – **H** :Ghana, Indonesia • **Cocoa beans** – **VH** : Ivory Coast • **Oil, soybean** – **VH**: Australia • **Oil, soybean** – **H** : Brazil	• **A** – : Palm oil • **B** : Soy • **B** : Cattle products	**High :** • High-profile company; • Exposure to multiple countries; • CDP grade; • High absolute amount and low input share (0.3%)
Asian agri-business company	• **Oil, palm fruit** – **VH** : Indonesia • **Palm, kernels** – **VH** : Indonesia	• **D** : Palm oil, Soy	**High :** • Very high level of input & medium input share (7%); • Level of scrutiny regarding commodity & country; • Very poor CDP grades
European food service company	• **Meat, cattle** – **H** : Brazil	• **C** : Cattle, Soy • **B** – : Palm oil	**Low :** • Single commodity & country ; • Low absolute level of input and low input share (1.5%) ; • Poor CDP grade
Asian vegetable oils company	• **Oil, palm fruit** – **VH** : Indonesia	• **B** : Palm oil	**High :** • Very high level of scrutiny towards both country and commodity ; • Very high input amount and high input share (30%) ; Wilmar is a leading palm oil producer ; • CDP grade shows no significant action

Figure 10. Example of a participant's results to deforestation-related transition risk assessment

b) Transition risks related to overfishing

Overall, while many portfolio companies use fish products as input, **only a few companies use a very large amount**. It could be further noticed that:

- **Only one analysed company of the sample is specialized in fish production** (aquaculture). A closer look has been taken at its sustainability practices and, in particular the composition of fish feed;
- Other companies belong to the **retail industry**. While the input share is low overall, the absolute amount of fish can be high.

Lastly, it should be noted that overfishing transition risks exemplify **how specific are overexploitation of resources risks.** For instance, they depend on the **type of practices**, specific **species**, **location** (state and status of ecosystems) or **institutional environments** (regulation and harmful subsidies for instance).

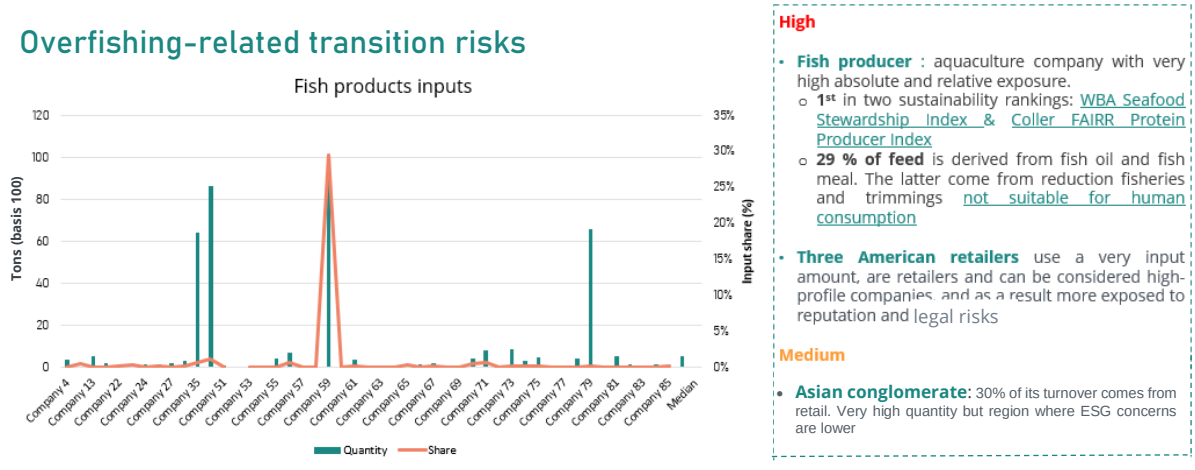


Figure 11. Example of a participant's results to overfishing-related transition risk assessment

c) Water pollution transition risks

The **relative share** of impacts attributed to water pollution is low because the bulk of the agrifood industry's impact is due to land use. The number of companies found to have a high absolute water pollution impact is low. Moreover, water pollution is to a large extent **location specific.**

The risk analysis led allows us to identify agrochemical companies as the subsector most contributing to water pollution. Besides, **thanks to IDL's data**, we could take a deep dive and look into **which commodities caused water pollution**. The analysis showed that the impact was not always due to commodities related to the agri-food industry. It can happen indeed that the water pollution impact is attributed to commodities used for other purposes, for instance pharmaceuticals or fragrances.

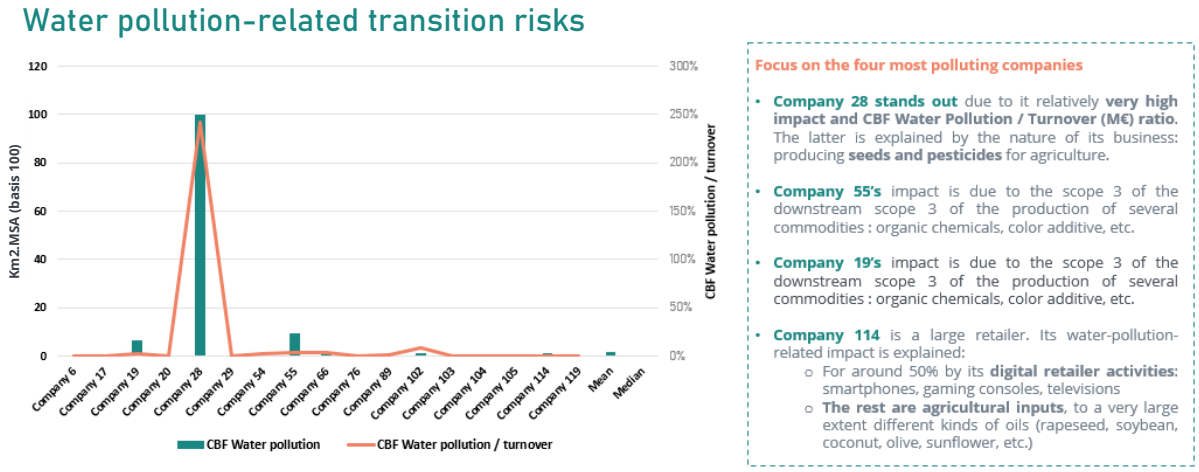


Figure 12. Example of a participant's results to water pollution-related transition risk assessment

4. Physical risks

The most important ecosystem services identified for the sample (surface and ground water provision, water flow maintenance and quality, mass stabilisation and erosion control, flood, and storm regulation)[14] are all decreasing worldwide. This means that all dependencies are potentially a factor of high-risk because their quality is depleting.

Regarding water-stress physical risk, the **share** of companies sourcing water-intensive commodities in countries experiencing a medium to very high level of water stress, according to the WRI, was measured. The level of risk was deemed low or **medium**.

[14] IPBES, « Global Assessment Report on Biodiversity and Ecosystem Services of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services ».

Out of portfolio samples' companies assessed across all four participants' portfolio, **nearly half** source water-intensive commodities in countries experiencing a medium to very high level of water stress. More than a dozen **uses large or very large quantities** of the identified water-intensive commodities (over 5,000 tons / m^3) with a couple of them evaluated, as a company, as **having a high risk**.

Commodities that stand out the most are **products of meat cattle, products of meat pigs and different kinds of oil**. Taking into account all water-intensive commodities, and regardless of the amount, countries of production vary and include not least Australia, Mexico, China but also several European countries. Only one country considered by the WRI as very highly exposed to water stress, that is **India**, is a sourcing country.

It should be noted that **water stress is a very localized pressured** (between and within countries) and that, **depending on the quantity of inputs, other commodities can have a high water-stress impacts**.

Company	Commodity / country	CDP Water	Company risk level
European food distribution & retail group	• Oil, soybean– Large: Portugal • Oil, sunflower – Large : Portugal	B	Low: • One strong water-intensive commodity • High water-stress country • Quantity in the lower tier of large quantities • Low input share
European retail company	• Oil, rapeseed – VL : Belgium • Products of meat cattle – L : Belgium • Products of meat pigs – VL : Belgium	C-	Low: • Poor CDP grade • Medium water stress country • Low input share
American agri-business group	• Cocoa beans– VL: Indonesia	A-	Medium: • Strong water-intensive commodity • Medium water-stress country • Large absolute quantity but low input share • Good CDP grade
European wholesale company	• Oil, rapeseed– VL: Germany – L : China • Oil, soybean – VL : Germany, China • Products of meat pigs – VL: France, China – L: Germany	B	Medium: • Strong water-intensive commodity (soybean oil) • High overall quantity & medium input share • Average CDP grade
Multinational food company	• Cocoa beans –L: Indonesia, Ghana • Oil, linseed – VL: Mexico, Australia; • Oil, maize – VL: Mexico, Australia • Oil, olive – VL: Mexico, Australia • Oil, rapeseed – VL: Mexico, Australia • Oil, sesame – VL: Mexico, Australia • Oil, safflower – VL: Mexico, Australia • Oil, soybean – VL: Mexico, Australia • Oil, sunflower – VL: Mexico, Australia • Sorghum – VL: Mexico, Australia	B	High: • Multiple types of commodities in a high water-stress country (Mexico) • Very high absolute quantities for all commodities • High overall input share • Average CDP grade

Figure 13. Analysis of water-stress-related physical risks of a portfolio

5. Opportunities

As identified in the methodology, we conducted an analysis on **three levers of change** [redesigning existing agroecosystems, change in consumption patterns and diets, reduction of food waste, and resource consumption] as detailed below. For each one a list of **practices leading to opportunities, illustrative indicators** and **type of business opportunities** is given (see figure 15, 16 and 17). Indicators and business opportunities are required by the TNFD framework.

Investors can **play a role in helping agri-food sector companies improve their biodiversity practices**. This can be achieved by engaging in dialogue with companies, proposing incentive policies to encourage sustainable practices, financing sustainable projects, and voting in general assemblies to encourage the adoption of sustainable biodiversity practices. By seizing this opportunity, investors can contribute to the long-term financial stability and growth potential of the company, increased social and environmental responsibility, and access to green financing. Additionally, financial institutions can help companies reduce their impact on the environment and promote biodiversity. Therefore, it is **important for financial institutions to understand how a company can improve its biodiversity practices,** as this can help them make informed decisions about their investments and contribute to a more sustainable future.

There is a significant opportunity for investors and businesses to leverage biodiversity for their long-term success. However, in order to do so, governments will need to play a crucial role in transforming current agricultural practices, shifting consumption patterns, and reducing food waste. While the private sector can certainly take action on its own, systemic changes will only come about through concerted efforts between governments businesses and investors. Thus, there is a need for increased collaboration between public and private sectors, as well as for government policies and regulations that incentivize sustainable practices and support businesses that prioritize biodiversity.

Main levers	Practices leading to opportunities	Illustrative indicators	Type of business opportunities
Redesigning existing agroecosystems (A transition to sustainable agricultural practices is needed)	Limit the expansion of agricultural land at the expense of natural land	Converted and conserved/managed areas in each ecoregion since 2020 (ha)[15]	Access to new source of finance for financing agroecological transition[16]: green bond, carbon farming (carbon credits), biodiversity credits, income through intercropping and animal grazing, etc.
	Increasing agricultural biodiversity through labels • Regenerative agriculture • Organic food • Agroforestery *E.g.: label AB; label eurofeuille; label demeter; HVE 3; RSPO segregated/no deforestation policy; rainforest alliance; regenerative Organic Certified (ROC)*	Surface of intensive agriculture transform in organic food agriculture (ha)	
	Increasing agricultural biodiversity through less impacting practices • Hedges, no-till farming • Reduction of pesticides • Reduction of chemical fertilizers (therefore reduce risks of eutrophication) • Intercropping, polyculture-livestock • Increase cultivated species diversity with local seeds • Limit the number of animals per ha of farmed land (pasture)	Water pollutant loading rate (kg pollutant/month)[17]; Mean Species Abundance (MSA)[18]; number of animals per ha of farmed land (pasture)	

Figure 14. List of opportunities linked to redesigning existing agroecosystems.

[15] Interim targets – Science Based Targets Network
[16] The TNFD Nature-related Risk and Opportunity Management and Disclosure Framework Beta v0.3 Annex 3.2 'Illustrative Indicators for Nature-related Risks and Opportunities November 2022
[17] Step_3_Freshwater_Public_ConsultationFINAL.docx (sciencebasedtargetsnetwork.org)
[18] 1 (wbcsd.org) & GLOBIO 3.5 technical model description | PBL Netherlands Environmental Assessment Agency

Main levers	Practices leading to opportunities	Illustrative indicators	Type of business opportunities
Change in consumption patterns and diets	Promoting and proposing alternatives to meat or dairy products with plant- or insect-based proteins at different step of agrifood chain: • Food producers: developing sustainably produced plant-based products & plant-based proteins • Food manufacture: Develop new plant-based protein offering • Food services: promoting meat-free menus and vegetarian offerings • Food Retailer: Provide substitution to proteins	% of plant- or insect-based protein sold. % of vegetarian meal present on the menu; amount invested in R&D to develop sustainably produced plant-based products	Increased market valuation through resilience planning Increased revenue due to better competitive position[19] Investments in start-ups moving toward vegetarian products
	Promoting and proposing local & seasonal diets	% of local & seasonal product in the supply	
	Promotion and offering a wide and affordable selection of organic foods	% of organic product in the supply	

Figure 15. List of opportunities linked to change in consumption patterns and diets.

[19] The TNFD Nature-related Risk and Opportunity Management and Disclosure Framework Beta v0.3 Annex 3.2 'Illustrative Indicators for Nature-related Risks and Opportunities November 2022

Main levers	Practices leading to opportunities	Illustrative indicators	Type of busin. opportunities

Reduction of food waste and resources consumption	Reduction of food waste at different step of the agrifood chain:
	• On field (adaptation to the demand)
	• During transformation processes and distribution
	  • Readapt industrial plants to treat with diversity of varieties and fight against standardization
	  • Systematically valorized by-products
	• At consumption level (rise awareness and promote good practices)
		Tons of food waste on field;
		Quantity of valorized by-products
			Ressource efficiency[20]:
			risk Reduced (operational costs, adaptation to the demand)
			Reputation improvement

	Limit water consumption step of agrifood chain: • On field: improve water infrastructure and produce in local region where crops can be mainly rainfed. • During transformation processes: manage wastewater, recycle water •	% of crops growing in region where crops can be mainly rainfed; water withdrawals (m3 /month) during transformation process[21]	
	Food products produced with sustainable packaging, green electricity, green transportation	Share of green electricity in the supply	

Figure 16. List of opportunities linked to food waste and resources consumption.

[20] The TNFD Nature-related Risk and Opportunity Management and Disclosure Framework Beta v0.3 Annex 3.2 'Illustrative Indicators for Nature-related Risks and Opportunities November 2022

[21] Step_3_Freshwater_Public_ConsultationFINAL.docx (sciencebasedtargetsnetwork.org)

D. TAKEAWAYS FROM THE PILOT TEST

1. Outcome of the analysis

Throughout this pilot, the risk & opportunity analysis could be **performed efficiently on a wide variety of financial portfolios** of corporate companies:

- Both investor portfolios and bank loan books;
- Top-down portfolios and thematic portfolios;
- From large-listed company to small non-listed private equity.

The agrifood centred pilot **enabled to discriminate risks & opportunities within the sector:**

- The "quantified impact footprinting" approach allowed impact **dispersion among corporate companies** to a certain degree**;**
- Discriminating impact **across sub-industry categories** (food production, food retail, agrochemicals, ...) and **across "main food manufacturing" categories** (Meat vs. Cereal, etc.).

A **quantitative value chain approach** proved both necessary and possible for the agrifood sector corporate companies. The industry shows a **highly predominant indirect impact** (scope 3 upstream at field) vs. a limited direct impact (scope 1). Subsequently, **the "localization" of direct impacts of these companies is less relevant** than for other sectors and focusing on company sites does not reveal the risks associated with main impacts & dependencies.

The **"localization" of upstream impact** has been performed but relies mainly on **statistical models** in the absence of exhaustive and detailed disclosure by companies of the localization of their sourcing, commodity by commodity.

2. Use of analytical methodologies

At company level, **the impact analysis has proved more robust & relevant** than the dependency analysis.

The impact analysis benefits from a **three-year track record of methodology development and use as well as the coverage of most pressures** (although overfishing is missing). The richness of underlying impact models (e.g., LCA), and existing disclosure on pressures allowed us to perform a thorough assessment based on the data that is available to date, public and private.

Although, CBF uses country-level data based on revenues (but not location data based on specific sites of production) and while this TNFD pilot demonstrated that the CBF can be

used to identify publicly listed companies at 'high to medium' risk from a potential impact perspective, the approach is still too nascent to be used to make actual financing or investment decisions.

As of today, the dependency analysis is less mature than the impact analysis and detailed due to the underlying frameworks, as ENCORE, and the low level of data availability from companies. We see a **strong need for detailed localization** to ensure relevance of dependency analysis.

A **specific "agri-food" risk mapping** could be established by combining underlying CBF data with geographical database. This would enable to run a risk analysis on a geographical basis by matching activities with geographical, biodiversity hotspots, for each company.

A **specific "agri-food" opportunity mapping** could be established and used for pure players which disclose their detailed product mix and specific practices. However, an industrialized analysis at portfolio level would require a **more standardized and detailed company reporting** on agriculture practices.

To date, **targets adopted by companies so far are too qualitative** to be used by data providers.

3. Practicality of LEAP-FI and the V-Process

From a financial institution perspective, very limited disclosure of location-based data at the company level makes it **irrelevant to start at the « Locate » step** for company portfolio assessment, **even if a localized approach is indeed embedded in the impact model**. A location-based approach could also be implemented in the risk analysis on **specific hotspots.**

Scenario-analysis at company level is hard to run in the absence of official and standardized transition scenarios, whether for biodiversity in general, or for agricultural systems.

Likewise, **financial valuation** of nature risks is requiring additional work from the stakeholders. The same goes with risk evaluation: Common biodiversity scenario and associated public policies & regulations are necessary to provide a **more solid ground necessary for risk materiality**.

Finally, models are still being built to **bridge extra-financial biodiversity impacts & dependencies** with financial risk.

E. FEEDBACK TO THE TNFD

1. Localization

While it is recognized that priority can be given to sectors, too much emphasis is put on **localization** at the Evaluate phase for financial institutions (LEAP-FI). It should be made clearer that, for equities and general-purpose debt/insurance, localized data of activity and supply chains can be used as a second step.

For instance, they could be put to good use when it comes to carry out a deeper analysis of most impacting or dependent companies or during risk assessment as done in this pilot.

Notwithstanding according to pilot participants, both **availability of data (not only location-based) and using data in a business context** remain a challenge. Hence, there is a need for both development of fit for purpose data and capacity-building within financial institutions.

2. Guidance

Sectoral guidance is still awaited, even for priority sectors like agriculture.

Besides, LEAP-FI requires many steps, areas of expertise, resources (cooperation between various services of an organization e.g.), and time, even when looking at 123 companies that only make up a small share of the pilot participants' portfolios or loan books. As a result, there will be a **steep learning curve** and reporting will be imperfect during the first years. It could therefore prove helpful to **specify what should be prioritized and how it should be done**.

As of today, many **steps or requests are out of reach** (systemic risks, scenario analysis). The TNFD should recommend focusing first on impact, risk, and opportunity assessment.

3. Taking biodiversity reporting to the next level

The TNFD has a **significant role to play in pushing for building underlying frameworks & standards** that are necessary to perform a thorough risks & opportunities assessment. Those frameworks and standards include:

- Construction of widely accepted biodiversity and nature **scenarios** alongside central banks for financial institutions;
- Setting **target** framework for companies (g. in coordination with SBTN);
- **Disclosure** framework for companies on **pressures**, **localization** (including upstream), and **practices;**

- **Biodiversity credits** framework that will help providing financial incentives for the biodiversity transition in close collaboration with governments and organizations with technical expertise on this topic.

4. Incentives

The TNFD should promote, through examples if need be, that **financing and investing in sustainable activities or "opportunities"** as highlighted by the framework **is or can be profitable or economically viable** both financial institutions as well as for companies as a mutual benefit.

Finally, there is an **urgent need for public policies, regulations, and incentives**, not least **financial**, to take agrifood industry transition to the next level. A close partnership with public authorities and regulators is consequently at stake, to also be able to make the link between the energy sector and the agricultural sector.

GLOSSARY

Biodiversity: The Convention on Biological Diversity (CBD) defines biodiversity as the variability among living organisms from all sources including, inter alia, terrestrial, marine, and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species (genetic), between species and of ecosystems.

Biodiversity footprint consists of modelling the pressures (e.g., emissions, resource use) and associated biodiversity impact throughout the whole value chain (both upstream and downstream) based on input/output-databases and biodiversity impact models

Corporate Biodiversity Footprint (CBF): The Corporate Biodiversity Footprint is a tool which assesses biodiversity footprinting using the metric of Mean Species Abundance (MSA). The CBF models the impact of corporates on biodiversity through four main environmental pressures on species and habitats (land use change, climate change, air pollution, and water pollution). These pressures are calculated along the whole value chain of the corporate, appraising their processes, products, and supply chains.

Dependency: Aspects of ecosystem services that an organisation or other actor relies on to function.

Ecosystem services: The Millennium Ecosystem Assessment (MEA) defined ecosystem services as "the benefits people derive from ecosystems". Four major categories of ecosystem services are identified: provisioning, regulating, cultural and supporting services:

- **Provisioning services** are the benefits that people can extract from nature (food, drinking water, timber, etc.).
- **Regulating services** are processes that moderate natural phenomena. They include pollination, decomposition, water purification, erosion and flood control, carbon storage, etc.
- **Cultural services** are non-material benefits that contributes to the development and cultural advancement of people (aesthetic inspiration, cultural identity, sense of home, spirituality).
- **Supporting services** are underlying natural processes that allow the Earth to sustain basic life forms (photosynthesis, nutrient cycling, creation of soils, water cycle). Other ecosystem services could not exist without supporting services.

ENCORE: ENCORE (Exploring Natural Capital Opportunities, Risks and Exposure) is a tool that helps users better understand and visualise the impact of environmental change on the economy as well as businesses' dependencies on ecosystem services.

Impact: The TNFD defines an impact as a change in the state (quality or quantity) of natural capital, which may result in changes to the capacity of nature to provide social and economic functions. Impacts can be positive or negative.

Land use change: Within the context of this pilot test, land use change is the combination of both land occupation and land transformation, according to the CBF methodology.

- **Land occupation** corresponds to the consequence of maintaining an area in a different biodiversity level than before due to current operations. It results from a company's current and recurring operations.
- **Land transformation** is the change in the use or management of land by humans, resulting in a difference in biodiversity before and after the transformation of the area, considering the time required for a spontaneous rehabilitation of biodiversity loss.

LEAP (Locate, Evaluate, Assess, Prepare): The LEAP approach is a four-step guidance developed by the TNFD to support internal, nature-related risk and opportunity assessments within corporates and financial institutions

Mean Species Abundance (MSA): The « Mean Species Abundance » (MSA) is a biodiversity indicator expressing the average relative abundance of native species in an ecosystem compared to their abundance in undisturbed ecosystems. This indicator is based on species abundance. It is therefore an indicator that measures the conservation status of an ecosystem in relation to its original state, undisturbed by human activities and pressures. For instance, an area with an MSA of 0% will have completely lost its original biodiversity (or will be exclusively colonised by invasive species) whereas an MSA of 100% reflects a level of biodiversity, equal to an original, undisturbed ecosystem.

Opportunities: The TNFD defines nature-related opportunities as activities that create positive outcomes for corporates and/or financial institutions and nature by avoiding or reducing impact on nature or contributing to its restoration. Nature-related opportunities can occur: i) when organisations mitigate the risk of natural capital and ecosystem services loss; and ii) through the strategic transformation of business models, products, services, and investments that actively work to halt or reverse the loss of nature, including the implementation of nature-based solutions or support for them through financing or insurance.

Pressure: Pressures or impacts drivers are measurable quantities of a natural resource that are used as an input to production and measurable non-product outputs of a business activity that affects biodiversity and ecosystem processes. The IPBES defined five main direct drivers of biodiversity loss: **land use change, climate change, natural resource use and exploitation, pollution, and invasive alien species.**

Risk: The TNFD defines nature-related risks as the potential threats posed to an organisation linked to its, and other organisations', dependencies on nature and nature impacts. Risks fall into three categories:

- **Physical risks** are a direct result of an organisation's dependencies on nature. These can be acute (e.g., natural disasters), chronic (e.g., decline in pollination services) or both. Nature-related physical risks arise as a result of changes in the biotic (living) and abiotic (non-living) conditions that support functioning ecosystems
- **Transition risks** are risks that result from a misalignment between an organisation's or an investors strategy and management and the changing landscape in which it operates. Four types of transition risks are identified: policy/legal, technology, market, and reputation)
- **Systemic risks** arise from the breakdown of the entire system, rather than the failure of individual parts. They are characterised by modest tipping points combining indirectly to produce large failures with cascading of interactions of physical and transition risks. Systemic risks are ecosystem collapse, aggregated risk, and contagion (financial stability)

V-Process: The V-Process is a five-step process developed by the Finance for Biodiversity Foundation to help financial institutions to effectively integrate biodiversity into their activities based on existing frameworks, standards, commitments, tools, and databases.

ABOUT I CARE BY BEARING POINT

I Care by BearingPoint, the leader in impact transformation, is BearingPoint's sustainability consultancy.

Its experts support companies, financial institutions, and public organisations in their transition, from strategic thinking to implementation, by offering concrete and innovative solutions.

I Care's ambition is twofold: to provide technical expertise on the environment, climate, biodiversity, social impact, and the circular economy; and to combine this with its know-how in transformation to engage its clients in the necessary evolution of their businesses and business models.

I Care by BearingPoint is a leading player in the field of sustainable development and brings together an international community of consultants.

Because our **impact** matters

I Care by BearingPoint

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