THE CURRENT STATE OF NATURE-RELATED DATA AND EXAMPLES OF ITS USE — HOW TO TURN DATA INTO BUSINESS OPPORTUNITIES —

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SUMMARY

- The use of nature-related data is becoming more widespread. By making use of data analysis, it is possible to deepen understanding of the risks that business may pose to nature and the risks that nature may pose to business, thus enhancing disclosure.
- As disclosure regulations are implemented and data collection technology advances, the use of data is expected to become more widespread in the future. However, it will take time to standardize data and converge the various tools. Meanwhile, there is also the possibility that disclosure will be required on a best-effort basis as regulations are put in place.
- It would be reasonable for sogo shosha to first put in place a flexible system that can utilize and analyze data while responding to regulations and technology. The know-how gained from analyzing and disclosing the various businesses in which they are involved could also become an added value.

1. UTILIZATION OF DATA IN INFORMATION DISCLOSURE

1-1. EXAMPLES OF USE OF NATURE-RELATED DATA

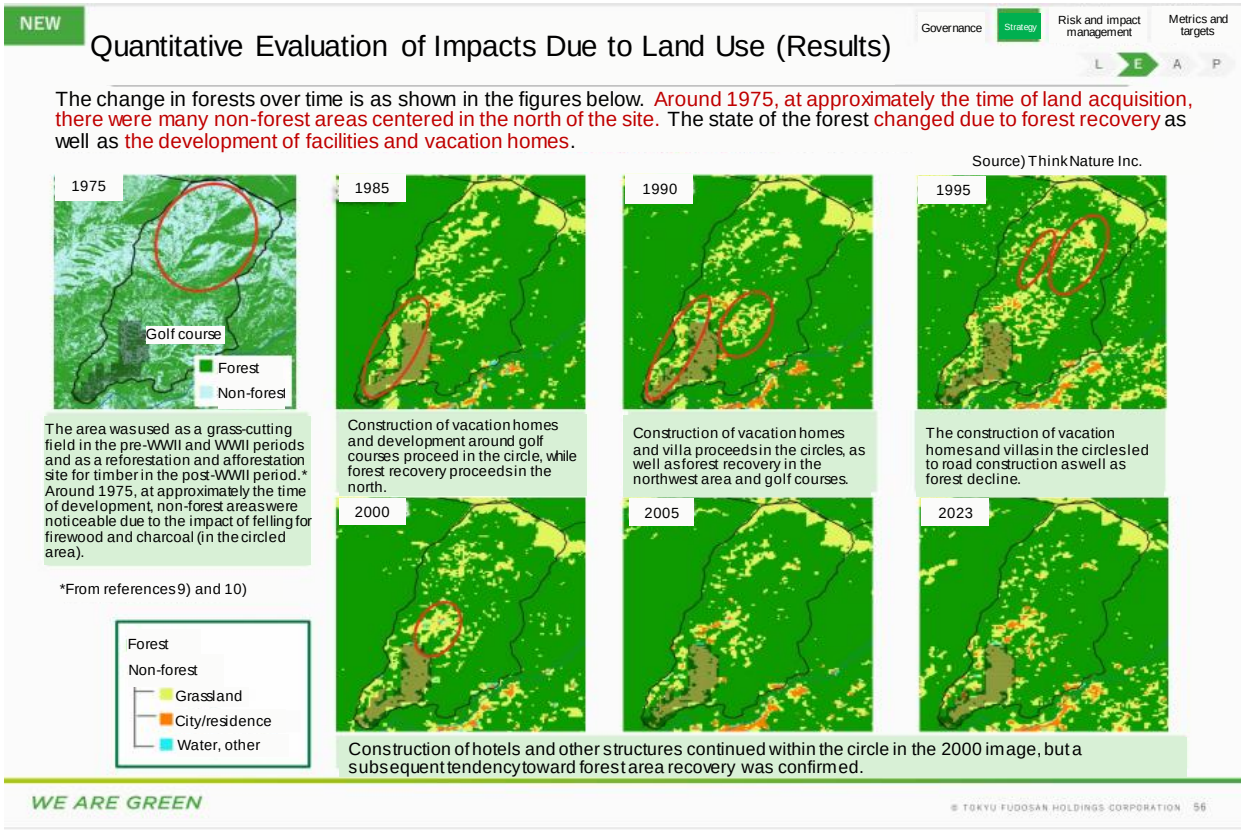
In 2023, the Taskforce on Nature-related Financial Disclosures[1] (TNFD) published recommendations on disclosure. As a result, there is increasing pressure to disclose nature-related information among non-financial information categories. On the other hand, there are examples of taking disclosure a step further by using data to improve the analysis of the risks that nature may pose to business and the risks that business may pose to nature. First, some case studies are presented below to get an idea of what kind of data can be used.

1-1-1. Case study: Tokyu Fudosan Holdings

The impact of land use in a multi-use resort project in Tateshina, Nagano Prefecture, Japan, was quantitatively evaluated (Figure 1). By comparing satellite images of land use of that area at the time of land acquisition (around 1975) to recently, and showing the percentage of forest area, the company demonstrated that the project has been operated while maintaining and restoring the forest.

[1] Taskforce on Nature-related Financial Disclosures: The taskforce has developed a set of disclosure recommendations and guidances that encourage and enable business and finance to assess, report and act on their nature-related dependencies, impacts, risks and opportunities.

Figure 1: Tokyu Fudosan Holdings "Quantitative Evaluation of Impacts Due to Land Use for Tateshina Resort Business"

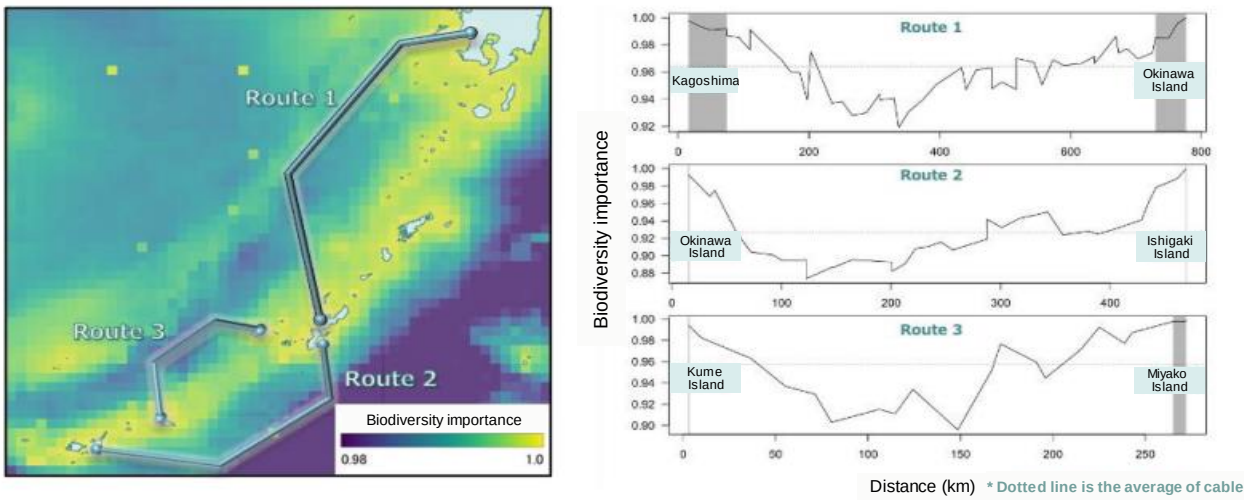


Source: Tokyu Fudosan Holdings "TNFD report (3rd edition) " [in Japanese], translated by MGSSI
https://tokyu-fudosan-hd-csr.disclosure.site/pdf/environment/tnfd_report_03.pdf
(accessed October 29, 2024), translated by MGSSI

1-1-2. Case study: Okinawa Cellular Telephone

Okinawa Cellular Telephone has identified environmentally sensitive locations and the impact of cable installation on the ecosystem for the three submarine cables it owns (Figure 2). This evaluation is useful not only for identifying the current situation, but also for recognizing the locations and ecosystems that should be considered in the future installation and operation of submarine cables.

Figure 2: Okinawa Cellular Telephone "Results of Evaluation of Biodiversity Importance for Submarine Cable Routes"

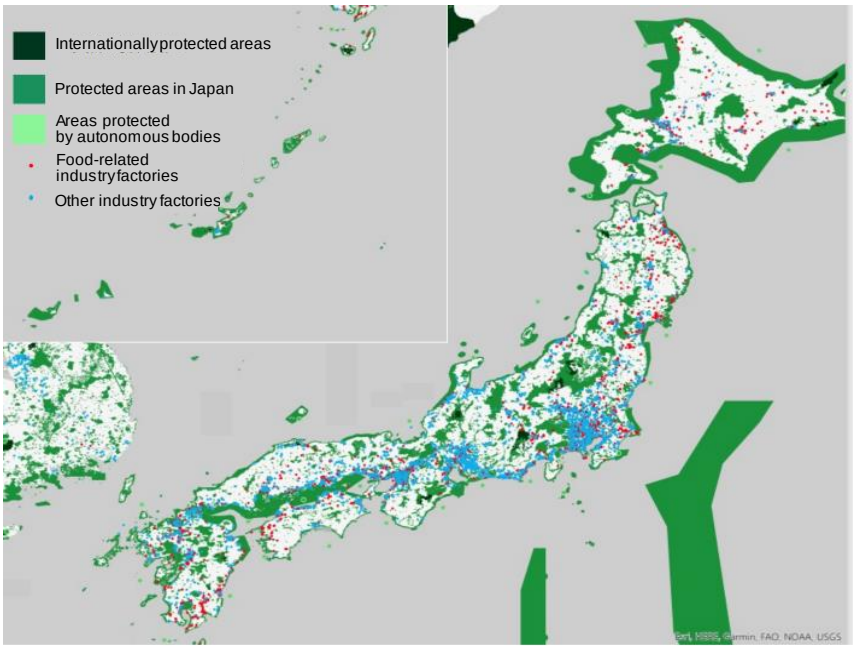


Source: Okinawa Cellular Telephone "TNFD report 2024" [in Japanese], translated by MGSSI
https://okinawa-cellular.jp/common/uploads/tnfd-report2024.pdf (accessed October 29, 2024), translated by MGSSI

1-1-3. Case study: The Norinchukin Bank

The Norinchukin Bank visualized the relationship between the critical sites of borrowers and protected areas on a map, and assessed that nature-related risks caused by the borrowers were limited (Figure 3). The company's dependence on nature for its business is shown visually.

Figure 3: The Norinchukin Bank "Mapping of Critical Sites of Borrowers and of Protected Areas"



Note: As there is little overlap between borrower factories (red, blue) and protected areas (green), it is recognized that there is little risk of borrowers having a negative impact on the natural environment of protected areas, with the statement that "the nature-related risk (of a borrower factory having a negative impact on a protected area's natural environment) is low."

Source: The Norinchukin Bank "Climate & Nature Report 2024" [in Japanese] https://www.nochubank.or.jp/sustainability/backnumber/pdf/2024/climate_nature.pdf (accessed October 29, 2024), translated by MGSSI

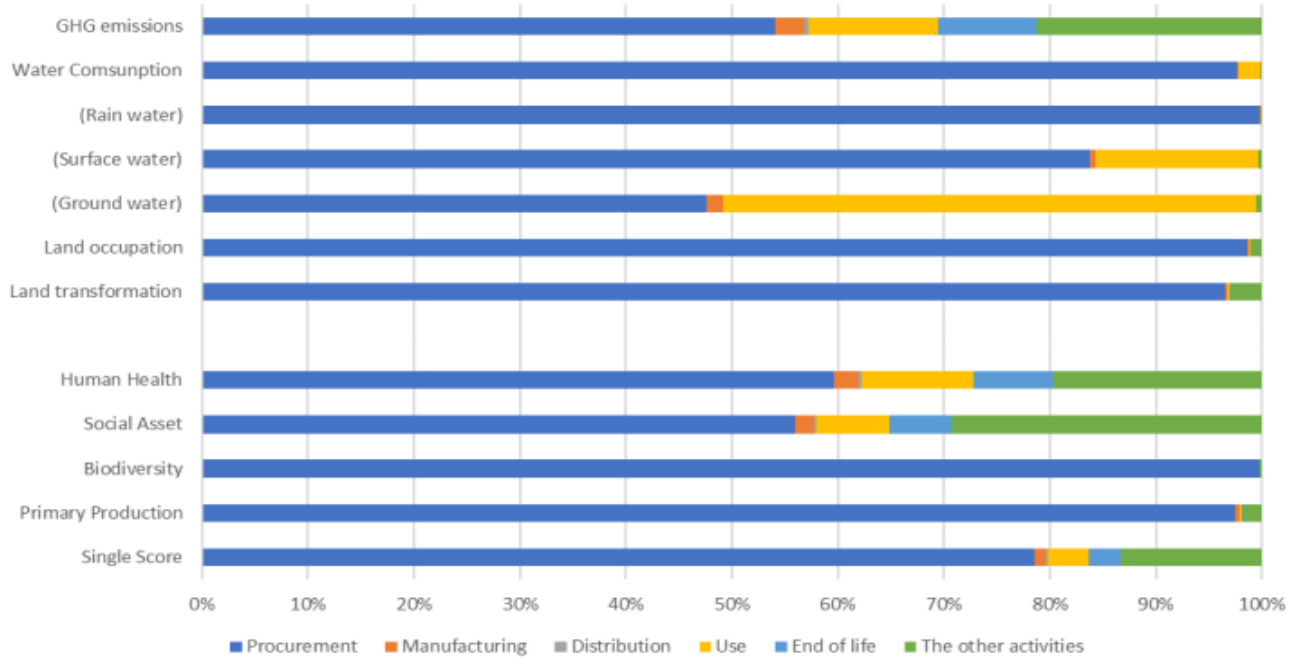
1-1-4. Case study: Shiseido

In order to gain a quantitative overall understanding of the scale of the environmental impact of business activities, Shiseido conducted life cycle assessment[2] using LIME3[3] for the Shiseido Group's activities in 2023, including the upstream and downstream in the value chain. It was shown that hotspots affecting biodiversity are in the raw material procurement stage, and that many of the impacts are due to land development associated with the cultivation of crops such as oilseeds and grains used in raw material production. This highlighted the importance of collecting and analyzing more detailed information on the impact of agriculture in raw materials procurement in order to identify the impact of biodiversity loss (Figure 4).

[2] This is an evaluation method based on Life Cycle Thinking, and it quantifies environmental burden from two perspectives (time axis / supply chain, and subject of evaluation). Time axis / supply chain refers to all processes from the extraction of raw materials to procurement, product manufacturing, transport, use, disposal, and recycling of products and services, and the subject of evaluation refers to various environmental burden items such as climate change (greenhouse gases), eutrophication, water resource depletion, and land use change.

[3] A method for analyzing the environmental impact of corporate activities, etc. on the world (for example, human health impact and species extinction) developed by a research team led by Professor Itsubo of Tokyo City University (at the time of development; currently a professor at Waseda University). The groundbreaking aspect of this method is that it enables the systematic analysis of climate change, air pollution, water and resource consumption, and other environmental impacts on the world, and enables the display of multiple environmental impacts in monetary terms. The results of the evaluation of environmental impact caused by corporate activities can be used as basic data for ESG investment.
Tokyo City University Press Release https://www.tcu.ac.jp/news/all/20181204-19073/ (accessed October 30, 2024)

Figure 4: Shiseido "Environmental Impacts Throughout the Value Chain (Assessment by LIME 3)"



Note: The larger the area, the greater the burden from the process. For example, with "GHG emissions," the process of "Procurement" is shown to have the largest GHG emissions in the value chain.

Source: "Shiseido Climate/Nature-Related Financial Disclosure Report"
https://corp.shiseido.com/en/sustainability/env/pdf/risks_report.pdf (accessed October 30, 2024)

1-2. CURRENT STATE OF DATA UTILIZATION

Disclosure of information related to nature analyzes both the impact of business on nature and the dependence of business on nature. In other words, the risks that nature may pose to business and the risks that business may pose to nature. The aforementioned disclosures by Tokyu Fudosan Holdings and Okinawa Cellular Telephone analyze the risks that nature may pose to business, while the disclosure by Norinchukin Bank analyzes the risks that business may pose to nature. In addition, the disclosures call for initiatives to reduce environmental burden and promote regeneration. Shiseido clearly shows which parts of its business should be focused on from the perspective of burden reduction. In all of these examples, the content of the disclosure goes beyond what is required by external standards, such as existing regulations, including environmental assessments, and the disclosure recommendations presented in the TNFD report. Their disclosures have been made with careful analysis and thoughtful consideration of the relationship between business and nature.

Increasing pressure for disclosure, as well as the availability of a wide range of data, are behind this kind of enhanced disclosure. This report summarizes the environment surrounding nature-related data and considers the implications for sogo shosha.

2. THE ENVIRONMENT SURROUNDING NATURE-RELATED DATA AND FUTURE PROSPECTS

2-1. REGULATORY TRENDS: THE NEED TO ANALYZE AND STANDARDIZE DATA DUE TO THE DISCLOSURE REGULATIONS AND NATURE CONSERVATION REGULATIONS BEING PUT IN PLACE

Looking at the need for data analysis, as awareness of risks to nature and biodiversity grows around the world, information disclosure rules are being established, with the TNFD recommendations of September 2023 at the

center. In addition to the pressure for information disclosure, regulations for operating businesses, such as the UK's Biodiversity Net Gain scheme[4], are being introduced and considered.

Under these circumstances, there is an increasing need for companies to conduct detailed analysis of the impact of their business on nature and the dependence of their business on nature, and to disclose such information in an easy-to-understand manner. At the same time, more companies are expected to follow the earlier examples: conducting their own analysis to gain a deeper understanding of their business-nature relationship and making this information clear to the public. Therefore, the demand for data that leads to improved quality of analysis and disclosure will remain strong, and its use is likely to continue to grow.

Still, it must be said that a considerable amount of time is needed for convergence in terms of data standardization. Disclosure of nature-related information is only in the trial stage, as demonstrated by the presence of placeholder[5] indicators in the 2023 TNFD recommendations (Figure 5). Although some progress has been made in organizing nature-related information through analysis by willing companies and research by the TNFD and other task forces, standardization remains challenging. This is because identifying the relevant location is crucial for nature-related information, but conditions vary widely from place to place. As a result, it is difficult to use a single indicator, such as GHG emissions for climate change, in discussions.

[4] Biodiversity Net Gain (BNG) development and land management regulations. These require that development plans for residential, commercial, and industrial areas increase biodiversity by at least 10% compared with before development.

[5] Although the TNFD recommends disclosure methods by sector, some of the indicators that are commonly recommended for all sectors (core global indicators) remain as placeholder indicators. Specifically, those are "unintentional introduction of invasive alien species," "ecosystem condition," and "species extinction risk," and research and development of appropriate indicators for those are underway (Figure 5, red text).

Figure 5: Indicators Recommended for Disclosure by the TNFD (Core Global Indicators) (announced in October 2023)

Category	Content shown	Specific disclosure indicators
Land/freshwater/ ocean (Use change)	Total spatial footprint	Total surface area controlled/managed by the organization
		Total disturbed area
		Total rehabilitated/restored area
	Extent of land/freshwater/ ocean-use change	The extent of use change is broken down into the type of ecosystem and the type of business activity, the extent of conservation or restoration is broken down into voluntary and mandatory, and the scope of sustainably managed ecosystems is broken down into the type of ecosystem and the type of business activity.
Pollution/ pollution removal	Pollutants released to soil	Total pollutants released to soil split by type
	Wastewater discharged	Volume of water discharged (split into total, freshwater, and other)
		Concentrations of key pollutants in the wastewater discharged (by type of pollutant)
		Temperature of water discharged
	Waste generation and disposal	Total waste generated spit into hazardous and non-hazardous waste
		Weight of hazardous and non-hazardous waste generated by type (split into incinerated, sent to landfill, and other)
		Weight of hazardous and non-hazardous waste diverted from landfill (split into reused, recycled, and other recovery operations)
	Plastic pollution	Plastic footprint as measured by total weight of plastics (polymers, durable goods, and packaging) used or sold broken down into the raw material content.
		Percentage of plastics that is re-usable, compostable, and recyclable technically, in practice, and at scale
	Non-GHG air pollutants	Percentage of non-GHG air pollutants by type 1. Particulate matter (PM2.5, PM10) 2. Nitrogen oxides (NOx) 3. Volatile organic compounds (VOC, NMVOC) 4. Sulphur oxides (SOx) 5. Ammonia (NH3)
Resource use/replenishment	Water withdrawal and consumption from areas of water scarcity	Water withdrawal and consumption from areas of water scarcity
		Quantity of high-risk natural commodities sourced from land/ocean/freshwater
	Quantity of high-risk natural commodities sourced from land/ocean/freshwater	Quantity of high-risk natural commodities
Invasive alien species and other	**Placeholder indicator (Measures against unintentional introduction of invasive alien species (IAS))**	Proportion of high-risk activities operated under appropriate measures to prevent unintentional introduction of IAS, or low-risk designed activities
State of nature	**Placeholder indicator (Ecosystem condition)**	**No indicator currently specified**
	Placeholder indicator (Species extinction risk)	

Note: “Placeholder” in red text means a placeholder indicator. It would suggest that research and development of appropriate indicators is underway.

Source: Compiled by MGSSI based on TNFD "Recommendations of the Taskforce on Nature-related Financial Disclosures"

2-2. TECHNOLOGY TRENDS: INCREASE IN AVAILABLE DATA THROUGH SATELLITE DATA, DRONES, ETC.

The increase in the number of small private-sector satellites, the development of drone technology, and other factors have led to an increase in the amount of data that can be collected. Driven by the growing demand for analysis of nature-related data, it is expected that these information-gathering technologies will continue to advance and that the amount of available data will increase in the future.

There are some limitations: (1) the difficulty of time-series analysis due to the lack of historical data, and (2) the impossibility of analysis due to issues such as resolution and data granularity. However, these can be resolved to a certain extent by combining multiple data sources, such as satellite, drone, and human-collected data.

2-3. INDUSTRIAL TRENDS: ANALYTICAL TOOLS AND BUSINESSES DEPLOYED IN A DISORGANIZED MANNER

As data standardization and technological progress are still underway, numerous data analysis tools are deployed in a disorganized manner. For example, the TNFD lists[6] more than 180 analysis tools on its official website, and the solution catalog[7] created by FANPS[8], an alliance of Japanese financial institutions, introduces 42 tools.

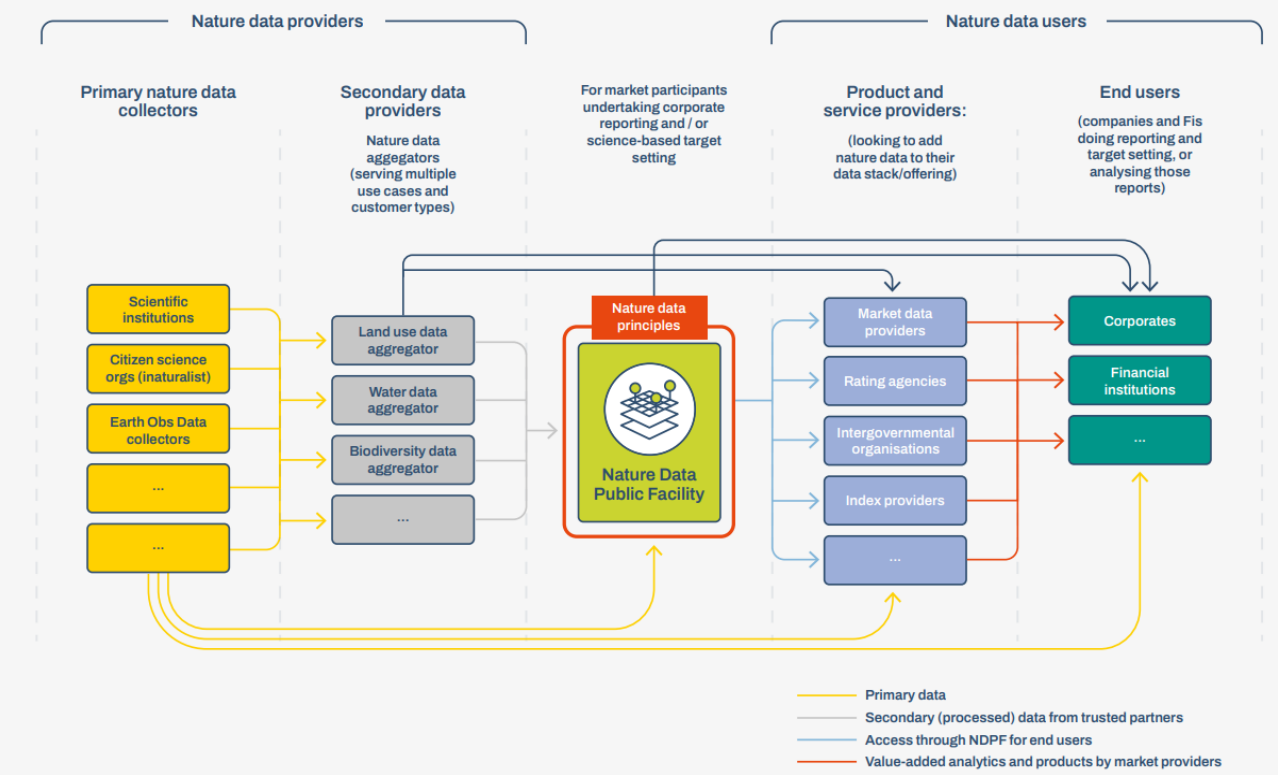
Each tool has a different method of data collection (satellite data, drones, etc.), different areas of collection (oceans, mountains, etc.), and different outputs (calculating original indices, color-coding and mapping, etc.). At this stage, it is appropriate to use each tool according to the purpose of the analysis, while being aware of the characteristics and technological trends of each tool.

2-4. DATA PLATFORM RESEARCH BY THE TNFD

The TNFD is researching the state of nature-related data, and in line with COP16[9] in 2024, disclosed a roadmap[10] toward organization of data. Upon organizing the supply chain for nature data, it announced the concept of the Nature Data Public Facility (NDPF) data platform (Figure 6).

6 Tools Catalogue – TNFD
7 fanps.jp/catalog
8 The official name is Finance Alliance for Nature Positive Solutions. This is an alliance established by four financial institutions—SMBC Group, MS&AD Holdings, Development Bank of Japan, and Norinchukin Bank—with the aim of promoting and supporting the transition of business activities in companies to nature-positive activities.
9 The 16th Conference of the Parties to the United Nations Convention on Biological Diversity. The venue was Cali, Colombia, and it began on October 21, 2024.
10 A roadmap for upgrading market access to decision-useful nature-related data – TNFD

Figure 6: TNFD's Concept of a Nature Data Public Facility



Source: TNFD "A roadmap for upgrading market access to decision-useful nature-related data" https://tnfd.global/publication/a-roadmap-for-upgrading-market-access-to-decision-useful-nature-related-data/ (accessed October 29, 2024)

The objective of the NDPF is provision of data that is accessible to all, inexpensive, timely, comparable, and of assured quality.

TNFD plans to publicly announce the partners and the NDPF at that time, begin pilot testing in 2025, compile results by the end of that year, and make the NDPF fully operational in 2026 after establishing a governance structure. While the TNFD will promote the NDPF, it does not envision operating it itself. It has announced that it will consider an appropriate operation system based on the results of the pilot tests.

2.5 FUTURE PROSPECTS

With the expansion of regulations and advances in technology, more and more companies will want to make use of nature-related data, and the demand for in-depth analysis using a variety of data is expected to grow. On the other hand, despite the research of the TNFD, it is difficult to predict the future because it takes a reasonable amount of time to standardize data and converge tools that are used in a disorganized manner, and development is based on trial and error through testing. In spite of this situation, work should begin as soon as possible to achieve nature positivity. There is a possibility that disclosure on a best-effort basis will be demanded as regulations are put in place.

For companies that have already started the analysis, it is therefore useful to consider appropriate data and tools and to deepen the analysis, rather than waiting for the system to be in place. They can do this based on the natural locations, conditions, and ways of interacting with nature identified through means such as the LEAP

approach[11]. By promoting utilization in advance, it is possible to immediately and reliably enjoy the benefits of technology progressing and systems being put in place.

3. SUGGESTIONS FOR SOGO SHOSHA

3-1. BETTER UNDERSTANDING AND DISCLOSURE FOR EXISTING BUSINESSES

A first step would be to put in place a flexible system that can utilize and analyze data while responding to regulatory changes and progress in technology. In each business division, it would be beneficial to consider what kind of data analysis would deepen understanding and enhance disclosure as the step after the LEAP approach, and to gradually build up practical initiatives. The effective use of data leads to a better understanding and disclosure of the relationship between businesses and nature. Even for businesses that are often overlooked, highlighting their nature-positive contributions can lead to the rediscovery of their value and provide an opportunity to communicate this in a way that is appealing to both employees and the public. Moreover, it would be beneficial to increase the volume of discussions and proposals on how to enhance business value based on the data analyzed and utilized.

3-2. IMPROVING ADDED VALUE THROUGH DEEPER UNDERSTANDING

In addition, deeper understanding of a business leads to improved added value. As previously mentioned, Tokyu Fudosan Holdings aims to create “experience-based sustainable resorts” in its resort business, and the more they understand their relationship with nature, the more they are able to improve the added value of their resort facilities through planning.

Sogo shosha, which operate across a wide range of businesses, possess a great deal of knowledge about the relationship between corporate activities and nature by accumulating analysis made by each department. This accumulation is believed to generate added value and contribute to the expansion of transactions in each business. The know-how of initiatives for nature-positivity and what kind of analysis is useful are advantages of doing business with sogo shosha.

[11] A method developed by the TNFD to evaluate and assess nature-related issues when companies make disclosures in line with the TNFD recommendations. It consists of four steps: identify interfaces between companies and nature (Locate), evaluate dependencies and impacts (Evaluate), analyze risks and opportunities (Assess), and prepare responses and reports (Prepare).