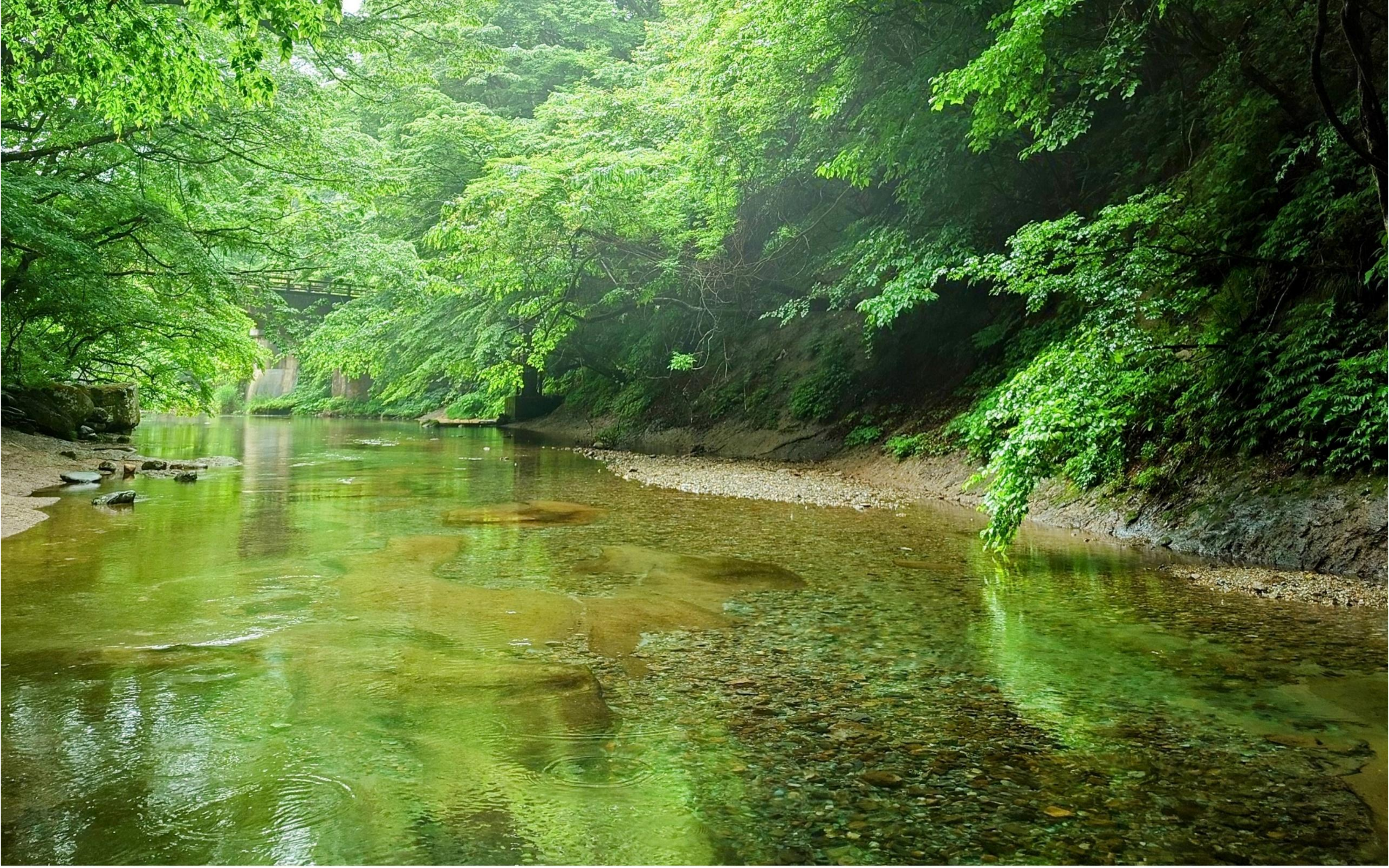

Climate- and Nature-related Financial Disclosure Report 2025

SHISEIDO

CONTENTS

PHOTO LOCATION

Front Cover: Kinomata Valley, Nasushiobara, Japan ©2026 Tomomi Kamimura

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Introduction

As non-financial information is increasingly utilized as a basis for evaluating a company's future value, companies are now required to provide transparent disclosure regarding sustainability targets and initiatives, including climate change. By providing a clear framework consisting of "Governance," "Strategy," "(Impact and) Risk Management," and "Metrics and Targets," the TCFD[1-3] and TNFD[4] have demonstrated to corporate management the importance of addressing climate issues and biodiversity as key business priorities. This growing importance of non-financial disclosure is evidenced by the International Sustainability Standards Board (ISSB)—established by the IFRS Foundation. Building upon TCFD recommendations, the ISSB published "IFRS S1; General Requirements for Disclosure of Sustainability-related Financial Information" and "IFRS S2; Climate-related Disclosures" in 2023, subsequently setting "Biodiversity, ecosystems and ecosystem services" and "Human capital" as its next agendas.

Furthermore, the World Economic Forum's Global Risks Report 2026[5] warns of "Extreme weather events," "Biodiversity loss and ecosystem collapse," and "Critical change to Earth systems" as the top three long-term risks for the global economy. Given the intensifying damage caused by natural disasters, accurately analyzing and proactively addressing climate- and nature-related risks and opportunities is crucial for sustainable business growth. For example, as many cosmetic ingredients derive from agricultural products such as oil palm, stable weather conditions, including rainfall and temperature, are indispensable for ensuring stable business continuity. Climate change can lead to water shortages or floods, broadly impacting the entire value chain and society.

The name of the "資生堂 (Shiseido)" is derived from a passage in the classical Chinese text, the 易経 (*Book of Changes*): "至哉坤元万物資生 (Praise the virtues of the Earth, which nurtures new life and brings forth significant values.)" Since our foundation, respect and gratitude for the blessings of the Earth have been positioned at the core of our business. Guided by our corporate mission, "BEAUTY INNOVATIONS FOR A BETTER WORLD," we pursue harmony between people and the planet, and are promoting "Circular Product Lifecycle Design" toward the realization of sustainable value creation. Recognizing the severe impact of climate change issues on business growth and social sustainability, the Shiseido Group expressed its support for the TCFD in 2019 and has since advanced the analysis of climate- and nature-related risks and opportunities. To mitigate climate change, we have committed science-based targets aligned with the 1.5°C trajectory and are progressively incorporating GHG emission reductions into our business operations. We have published this report as part of our ongoing efforts to ensure transparent disclosure of risks and opportunities—not only concerning climate but also biodiversity and nature—by referencing standards such as the TNFD and SSBJ (Sustainability Standards Board of Japan). Our initiatives regarding climate, water, and forests are disclosed through our corporate website, Integrated Report, and Sustainability Report, as well as through our responses to surveys such as those conducted by the CDP. This report outlines the risks and opportunities related to climate change and details the results of scenario analyses conducted as comprehensively as possible based on scientific and statistical evidence. Chapter 1 summarizes these results and provides an overview structured around the framework of "Governance," "Strategy," "Risk Management," and "Metrics and Targets." Chapter 2 details the scenario analysis conducted under "Strategy," including the modeling for each risk assessment, the indicators used in the analysis, the interpretation of the results, and the practical initiatives associated with them.

Please note in advance that the analysis results are accompanied by significant uncertainty. This is because analyzing phenomena related to global environmental issues such as climate change requires assuming a time scale that vastly exceeds normal business planning and risk management, and it is impossible to foresee all the various social and market changes that could arise from environmental issues.

Chapter 1:
Disclosures based on the TCFD and TNFD frameworks

1-1. Governance

The Shiseido Group has established "BEAUTY INNOVATIONS FOR A BETTER WORLD" as Our Mission in its Corporate Philosophy The Shiseido Philosophy, and defines the corporate governance as our "platform to realize sustainable growth through fulfilling Our Mission". The Company is committed to maintaining and improving management transparency, fairness and speed, by putting into practice and reinforcing the corporate governance, and strives to maximize medium- and long-term corporate and shareholder value through dialogues with all stakeholders, "employees," "consumers," "business partners," "shareholders," and "society and the Earth." In addition, while fulfilling social responsibilities, the Company aims to achieve optimized distribution of values to respective stakeholders.

At Shiseido Group, the Sustainability Committee was established to ensure timely management decisions related to sustainability efforts and their proper implementation across our Group, and meetings were held regularly in 2025.

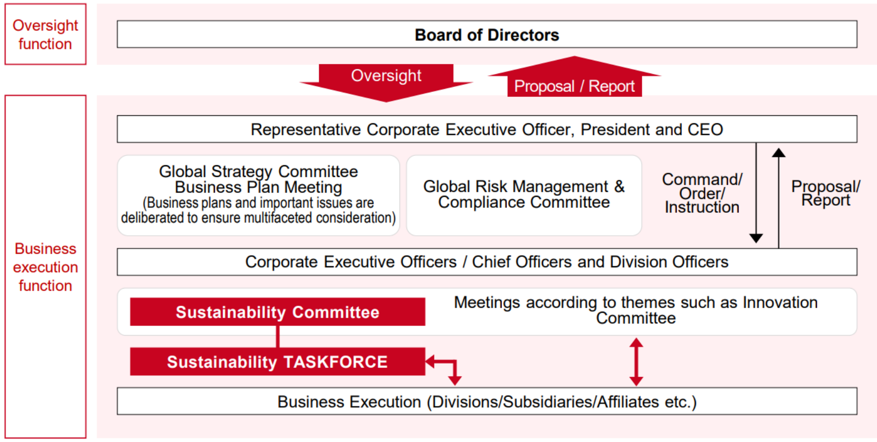

Figure 1 - Sustainability Governance Structure (As of January 1, 2026)

The committee makes decisions on specific action plans, including strategic actions and policies across Shiseido Group, climate- and nature-related risks and opportunities, and human rights initiatives, while also monitoring the progress of medium- to long-term targets in our sustainability strategy. The committee consists of the Representative Corporate Executive Officers and Officers from different fields, enabling discussions on a range of issues from diverse perspectives. Important matters requiring approval are proposed or reported to the Global Strategy Committee or the Board of Directors. Additionally, a Sustainability TASKFORCE, consisting of the heads of key relevant functions, discusses practical approaches to achieving long-term goals and solving sustainability-related issues, accelerating these efforts across departments, including overseas.

1-2. Strategy (Scenario analysis)

In this report, we adopted a double materiality approach to conduct a scenario analysis. We evaluated both the impact our economic activities directly or indirectly have on society and the Earth system as the impact materiality and the impact our company receives as feedback from society and the Earth system as the financial materiality. The analysis was conducted following the steps below:

1. Assessment of impact materiality using the environmental impact assessment method "LIME3[6-14]."
2. Screening of financial materiality due to physical factors via literature review.
3. Quantitative assessment of the financial impacts of risks and opportunities for factors judged to have a significant influence.

For the evaluation of impact materiality, we utilized LIME3, an environmental impact assessment method that monetizes the social and environmental impacts associated with economic activities. LIME3 is a life cycle impact assessment method, and can analyze the extent to which specific environmental impacts—such as climate change, air pollution, and resource consumption—damage four key areas: human health, social assets, biodiversity, and primary production of plants. It integrates and evaluates this damage in monetary terms based on the willingness to pay to avoid it.

We evaluated the impact materiality for individual environmental impacts and specific damage targets by conducting an organizational Life Cycle Assessment (LCA) using the LIME3 method. This assessment was based on our activity volume across the value chain in 2025, encompassing energy and water resource consumption during procurement and operations, industrial waste treatment, logistics, sales, product use, and product waste treatment.

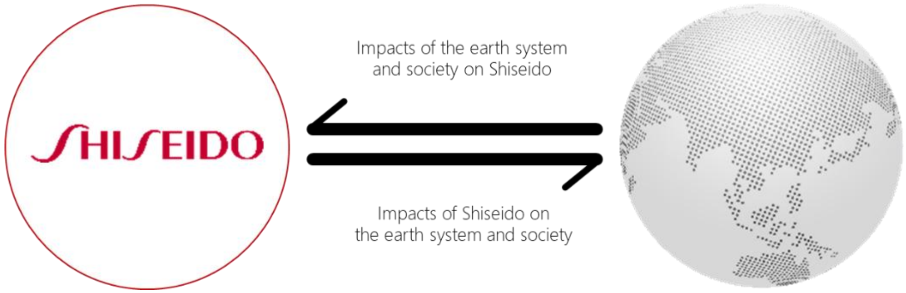

Figure 2 - Double Materiality

In accordance with ISO 31000, risk is defined as the "effect of uncertainty on objectives." The magnitude of a risk is determined by the balance between the hazard, consequential damage of an event, and its probability of occurrence. For example, in the flood risk assessment detailed later, the financial damage in the event of a flood corresponds to the "consequence," while the current and future probability of a flood occurring corresponds to the "probability."

In climate and nature-related risk analysis, we forecast how rising temperatures and progressive biodiversity loss will alter the severity of event consequences (e.g., flood scale) and their return periods or probabilities, thereby assessing the magnitude of resulting damages. Therefore, understanding the relationship between climate change or biodiversity loss and specific risk factors, such as floods or water shortages, is crucial. However, it is important to note that floods and water shortages occurred globally even prior to the Industrial Revolution. Thus, these risks would not drop to zero even if the impacts of climate change were eliminated. Naturally, not all future anticipated risks originate solely from climate change.

To account for climate change factors, we established virtual scenarios in accordance with the IPCC Sixth Assessment Report (AR6)[15)], ranging from RCP1.9-SSP1 to RCP8.5-SSP5. These include the 1.5°C/2°C Scenario; a world that unites in mitigation efforts and successfully curbs climate change, and the 4°C Scenario; a world where no mitigation efforts are made, leading to significant temperature increases. Under these scenarios, we analyzed the market and social environment changes accompanying societal shifts (transition risks/opportunities) and the impacts of natural phenomena driven by temperature rises (physical risks/opportunities). Because various events and relationships can generate climate-related risks and opportunities, we screened physical risk factors based on the IPCC AR6 and the Shiseido Group's operational regions. Regarding the transition Risks, impacts from changes in policies, regulations, technology, markets, and reputation associated with the shift to a decarbonized society were extracted. For the physical

Risks, we identified impacts from acute and chronic changes, such as floods and shifting weather conditions driven by rising temperatures.

In the biodiversity domain, a clear correlation between the extent of its loss and the subsequent impact on individual socio-economic activities has not been firmly established. This makes it challenging to draft highly valid scenarios that define changes in occurrence probabilities. Furthermore, it is currently difficult to evaluate the risk mitigation effects of substituting ecosystem services with artificially introduced organisms or relocating economic activities. Therefore, while we anticipate the future development of scientifically rational and versatile forecasting scenarios, this report utilizes the hazard assessment results under extreme scenarios as a proxy for biodiversity risk assessment.

To forecast the financial impact of individual risks, we establish the damage cost of a triggering event as the hazard—based on our current operational footprint (e.g., operating regions and activity volumes) and our dependencies and impacts on natural and climate systems. We then multiply this hazard by the event's probability of occurrence. This probability is determined by social (e.g., countries, regions) or geographical (e.g., river systems) divisions, as well as constraints from the natural and social environment, such as water availability and water stress. For instance, when assessing water shortage risks, we determine frequency using statistical data from the past 30 years regarding water supply restrictions due to droughts, which we then apply to the impact assessment of the "current" risk. For future financial impact projections, we overlay multiple climate scenarios from 1.5°C/2°C to 4°C with some future parameters such as the future rainfall forecasts, the demographic projections, the forecasts of our business growth and asset sustainability, and the lifespans of businesses and facilities. By superimposing these factors while accounting for uncertainties, we calculate the relative fluctuation rate of the probability of future water supply restrictions due to droughts. This rate is then multiplied by the current risk assessment results.

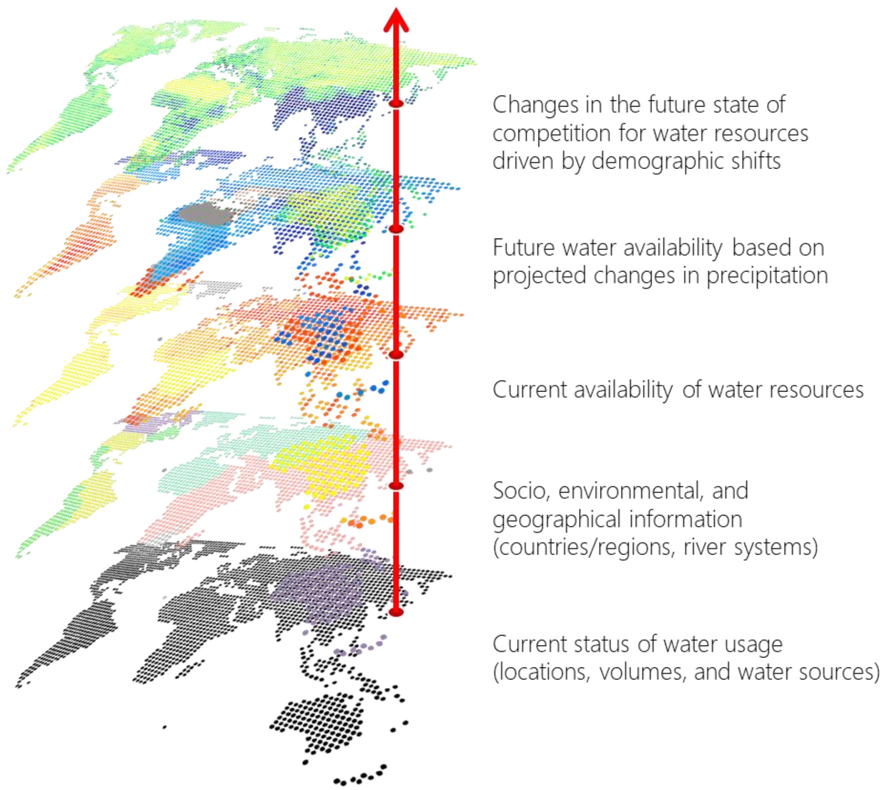

Figure 3 - Image of Financial Impact Assessment of Risks

The impact materiality and financial materiality results evaluated through this comprehensive methodology are summarized in Table 1.

Table 1 - Climate and Nature-related Impacts, Risks, and Opportunities

Category	Midpoint			Financial impact	Endpoint	Financial impact
Impact materiality	Climate change			10 bil. JPY	Human health	3.7 bil. JPY
	Water resource			30 mil. JPY	Social asset	8.4 bil. JPY
	The others			7.6 bil. JPY	Biodiversity	3.2 bil. JPY
					Primary production	2.4 bil. JPY
Category	**Risk / Opportunity**			**Driver**	**Event**	**Financial impact**
Financial materiality	Opportunity			Climate change	Expansion of sales opportunities for UV care products	1.6 bil. JPY
					Reduced dependence on fossil resources through renewable energy introduction and energy conservation	—
				Climate change, nature	Expansion of sales opportunities for circular products like refills	—
	Risk	Transitional driver		Climate change	Increased operational costs due to expanded carbon tax implementation	53 mil. - 2.2 bil. JPY
					Increased procurement costs due to expanded carbon tax implementation	3.5 bil. JPY
		Physical driver	Acute	Climate change	Production and logistics stoppages due to natural disasters (floods)	870 mil. JPY
					Destabilization of palm oil production due to natural disasters	140 mil. – 290 mil. JPY
			Chronic	Climate change	Production stoppages due to water shortages	3.2 bil. JPY
				Nature	Increased procurement costs due to the decline of pollinators	2.6 bil. JPY

1-3. Risk management

Shiseido Group promotes risk management with a primary focus on building trust with all stakeholders and achieving our management strategy. We define risk as the effect of uncertainty on strategic objectives, encompassing not only threats but also opportunities, and have established a framework that enables proactive and timely responses.

To identify and assess material risks, we take a holistic, multifaceted approach. We gather perspectives through interviews and discussions with our Officers, regional CEOs, and Directors, and combine these insights with regional risk assessments, information sharing by relevant departments, analyses conducted by the risk management function, and insights from external experts. Through this process, we identify material risks including climate- and nature-related risks such as "Environment (Climate Change, Biodiversity, etc.)" and "Natural Disasters, Infectious, Diseases, and Terrorism" that could affect the achievement of our 2030 Medium-Term Strategy.

Identified risks are evaluated by the risk management function along three dimensions: potential business impact, likelihood of occurrence, and vulnerability. Company-wide risks and risks related to individual cases, together with their counter measures, are regularly reviewed by the Global Risk Management &Compliance Committee and the Global Strategy Committee, both chaired by the CEO and comprising Officers and regional CEOs. The material risks identified and assessed each year are reflected in the formulation of our Group's management strategy. Furthermore, to mitigate their potential impact, a designated risk owner is assigned to each material risk and a consistent framework is applied that covers the formulation of counter measures, progress monitoring, and regular discussions with the above Committee members and Directors.

1-4. Metrics and targets

The Glasgow Climate Pact, which agreed to limit global average temperature rise to 1.5°C above pre-industrial levels, was adopted in 2021. Achieving the 1.5°C target requires reducing global human-induced GHG emissions to net-zero by around 2050; in other words, the Pact signifies the world's shared recognition of the goal to transition society toward net-zero. There is no doubt that business environments will be significantly impacted as society aims for low-carbon and decarbonization.

In 2025, Shiseido Group reviewed the material issues defined in 2019, taking into account changes in society and the industry, as well as related risks and opportunities. Through dialogue with a wide range of stakeholders, including employees, consumers, business partners, and shareholders, and consideration for society and the environment, we identified 19 material issues. These were assessed from the two perspectives of "importance to all stakeholders" and "importance to Shiseido Group's business," and organized into four categories aligned with the 2030 Medium-Term Strategy.

Lifelong QOL improvement through diverse "power of beauty"	1 Consumers' QOL 2 DE&I 3 Respect for human rights 4 Innovations	5 Product safety 6 Responsible marketing and advertising 7 DX
Resilient management foundation building	8 Governance & accountability enhancement 9 Fair business transactions 10 Information security, cybersecurity & privacy	11 Stakeholder engagement
Our people and organizations to create beauty value	12 Our people & organization for value creation 13 Occupational health and safety	
Harmonization with nature (Circular Product Lifecycle Design)	14 Climate change 15 Biodiversity 16 Water usage 17 Circular products and manufacturing	18 Chemical safety and management 19 Responsible procurement

Figure 4 - Shiseido Group's Materiality

Based on these materialities, we have set new medium-to-long-term targets in the environmental and social domains toward 2030. As shown in Table 2, many of the new environmental targets relate to mitigating climate and nature-related risks.

Table 2 - Shiseido Group's Environmental KPIs (Metrics and Targets) and Relationship to Climate- and Nature-related Risks

Strategic action	Domain	Indicator	Target	Scope 1 & 2 emissions	Scope 3 emissions (Category #)	Nature and Biodiversity	Related Risk
01 Reducing our environmental footprint	CO_2	CO_2 emission reduction〈Scope 1・2, validated by SBTi〉	46.2%	✓	✓		Carbon tax, Regulation, Reputation
		CO_2 emission reduction〈Scope 3, validated by SBTi〉	55%		✓ (ALL)		
	Water	Water consumption reduction	50%	✓	✓ (1)	✓	Operation
	Waste	Waste to be recycled or recovered for energy	100%		✓ (5)		
02 Developing sustainable products	Ingredient	Circular ingredient usage	90%		✓ (1, 12)	✓	Procurement
		Eliminating controversial ingredients from formula	100%			✓	Reputation
	Packaging	Recycled or bio-based materials used in cosmetic primary packaging	15%		✓ (1, 12)		Procurement, Regulation, Reputation, Human rights
		Recycled material used in cosmetic PET packaging	30%		✓ (1)		
		Reduction of virgin petroleum plastic used in cosmetic primary packaging	20%		✓ (1, 12)		
03 Promoting sustainable and responsible procurement	Palm oil	Procurement of sustainable palm oil	100%		✓ (1, FLAG)		
		Traceability of oil mill	85%			✓	
	Paper	Procurement of sustainable paper	100%		✓ (1, FLAG)	✓	
		Traceability of pulpwood to the state or prefecture level	100%			✓	
	Soy	Procurement of RTRS-certified raw materials or procurement not involving deforestation	100%		✓ (1, FLAG)	✓	
	Mica	Procurement from suppliers not involved in child labor	100%				
	Conflict minerals	Procurement that does not contribute to the financing of conflict or acts of war	100%				
	Supplier management	Critical risks from direct and indirect suppliers	0				

Their structure is such that they either contribute to improving business resilience or, by advancing initiatives to achieve the targets, lead to the suppression of Scope 1, Scope 2, and Scope 3 GHG emissions, culminating in the achievement of science-based GHG reduction targets. These material issues represent key focus areas and the new medium-to-long-term environmental and social targets based upon them directly linked to Shiseido Group's sustainable growth and the enhancement of corporate value. We will address social issues through our business while pursuing sustained profitability and creating new value through beauty.

This chapter also details the transition plan toward decarbonization and biodiversity conservation related to the new targets, alongside their relationship with risk/opportunity management. When longer-term and more specific activities are added, we will append or amend them as necessary to advance transparent information disclosure.

1-4-1. GHG Emissions and Renewable Energy

Recognizing the importance of a sustainability perspective in decision-making, the Shiseido Group has adopted ESG elements, including the "Achievement Status of CO_2 Emission Reduction Targets," with a 20% weight as an evaluation metric for the long-term incentive-type executive compensation.

Approximately 60% of GHG emissions from energy used in our activities (Scope 1 and 2) originate from production activities at our factories. For this reason, since 2023, we have introduced internal carbon pricing as a shadow price for capital investments in factories. By conducting cost-benefit analyses that include carbon prices, we are backing decision-making in decarbonization investments, such as improving energy efficiency. We have set the carbon price at 130 USD per ton of GHG emissions (CO_2 equivalent) in alignment with the IEA NZE scenario. Moreover, by utilizing the latest IT technologies like energy management systems, we are suppressing unnecessary energy consumption while visualizing GHG emissions from production processes, striving to improve employee education and motivation for energy-saving activities. Concurrently, regarding the electricity we use, we aim to transition to 100% renewable energy-derived electricity by 2030.

Regarding GHG emissions, with a long-term goal of net-zero by 2050, we have set intermediate targets by 2030 aligned with the 1.5°C trajectory: a 46.2% reduction in Scope 1 and Scope 2 GHG emissions, and a 55% reduction in Scope 3 indirect emissions from the value chain per economic unit (per value added in US dollars). In addition to internal initiatives such as selecting raw materials based on green chemistry principles, proactively introducing plant-derived raw materials, expanding refill/replacement products, optimizing designs to reduce container weight, improving the recyclability of containers, and adopting EVs to lower energy in outbound logistics, we aim to reduce GHG emissions across the entire value chain. This is pursued through collaboration with various stakeholders, including suppliers, through actions such as procuring raw materials without land conversion or natural forest destruction, introducing renewable energy into the supply chain, and developing and implementing social models to efficiently recover and recycle a broader range of materials

Strategic initiatives toward decarbonization based on our climate policy are identifying and utilizing decarbonization-related opportunities, such as financing, and mitigating risks by lowering dependence on fossil-derived energy. By repeatedly reviewing practical activities and their effects, we aim to achieve our climate change countermeasure goals by establishing an environment that creates a virtuous cycle that also impacts business strategies and financial plans.

Table 3 displays the GHG emissions associated with our 2025 activities. Our disclosed GHG emissions (Scope 1, Scope 2, and major categories of Scope 3) are verified by SGS Japan Inc., an independent third-party verification body. Furthermore, our targets related to GHG emission reduction have been certified by the SBTi as targets aligned with the 1.5°C trajectory.

1-4-2. Water

Water is not only an important ingredient for cosmetics but also an indispensable resource in every aspect related to cosmetics, including the cultivation of crops for raw materials, heat transfer media and cleaning during production, and the usage of the products. Because climate change affects global atmospheric circulation, precipitation conditions are predicted to change significantly. Furthermore, while glaciers in the Himalayas and the European Alps act as water sources supporting societies in Asia and Europe, there is concern about their retreat due to rising temperatures. Due to these climate change impacts, some regions currently blessed with water resources may face concerns about drought in the future.

Therefore, aiming for the effective utilization of water resources and the mitigation of water risks caused by climate change, Shiseido has set a target to reduce the volume of water resources consumed at its business sites by 50% (per sales unit) by 2030 compared to 2014. We are advancing water conservation activities primarily centered on production factories with high water consumption. In addition to optimizing equipment cleaning and reviewing manufacturing processes to save water, our factories in France—a country highly concerned with water issues—have set proprietary targets. They have implemented initiatives such as reusing water that has been used once and switching from water cleaning to alcohol cleaning for fragrance manufacturing equipment, achieving a water saving of over 60% per bulk production volume relative to 2009 levels, prior to the launch of the initiatives.

Moreover, given the critical impact that water resource availability has on our business, we participate in the "Water, Climate Change, and Sustainable Development Study Group" led by Professor Taikan Oki of the University of Tokyo, striving to acquire the latest knowledge in hydrology and climate change. We continually aim to refine the validity of our company's water resource risk analysis methods through discussions with experts not only in academia but also in civil engineering and architecture.

1-4-3. Ingredients

Not only energy such as electricity and gas, but also chemically synthesized materials that we take for granted in our daily lives—such as plastics, high-molecular-weight polymers, and fertilizers essential for agricultural production—rely on fossil resources. To realize a net-zero society, we must transition these carbon sources from fossil resources to biomass carbon or recycled carbon derived from biomass. In a society involving no substantive GHG emissions, utilizing fossil resources will require combining them with carbon sequestration processes like CCS and BECCS, implying that chemical synthetic products derived from fossil resources will lose their price advantage in the future. The University of Tokyo and Systemiq conducted a scenario analysis on future demand forecasts and carbon source transitions for the chemical industry in Japan and globally, with a net-zero society in mind, reporting that a sustainable chemical industry operating within planetary boundaries is achievable[16, 17]. For cosmetic ingredients manufactured through chemical synthesis, it is vital for long-term business continuity to attempt to transition carbon sources, just as with other chemical products.

Based on backcasting from a net-zero society and green chemistry principles, the Shiseido Group has set a medium-to-long-term environmental target, using 2030 as a milestone: "90% of cosmetic ingredients will be raw materials that are regenerated and circulated within human society and natural systems." This target marks the start of a "long journey" looking even further beyond 2030, and it reflects a piece of our determination to "become a company that continues to shine for 100 years and is trusted by diverse people worldwide."

On the other hand, as the transition from fossil resources to biomass resources progresses globally toward a net-zero society, there is concern that adverse effects on deforestation and biodiversity will increase as a trade-off. Building a sustainable and responsible supply chain that considers the deforestation and human rights risks described later aims to minimize the trade-offs associated with climate change and carbon management.

1-4-4. Packaging

Cosmetic packaging uses various materials, including glass, plastic, paper, and metal. In 2025, we procured approximately 37,000 tons of cosmetic packaging materials, of which approximately 13,000 tons were plastic (including some estimates). Aiming to transition to a circular economy, conserve and effectively utilize limited resources, and reduce GHG emissions associated with the procurement and disposal of packaging, the Shiseido Group has set new targets by 2030: (1) to achieve a 15% ratio of recycled or bio-based materials in cosmetic packaging; of that, (2) to achieve a 30% ratio of recycled materials in cosmetic PET containers; and (3) to reduce the amount of virgin plastic used in cosmetic containers by 20%.

For example, Kyoei Industry Co., Ltd., a Japanese recycled PET manufacturer, reports that the GHG emitted during the recycling process—which includes collection, sorting, crushing, washing, and impurity removal via solid-state polymerization of waste PET containers—is 0.583 kg-CO_2e per 1 kg of recycled PET resin[18]. Compared to petroleum-derived virgin PET for bottles, this can reduce GHG emissions from PET manufacturing by approximately 83%, and even if 100% incinerated at the disposal stage, it can achieve a 51% reduction in total emissions across procurement and disposal stages.

As for bio-based materials, high-density polyethylene manufactured from Brazilian sugarcane is reported to have a total emission of -2.12 kg-CO_2e across the procurement and disposal stages[19]. Compared to petroleum-derived high-density polyethylene, it is possible to reduce GHG emissions by approximately 80% over the lifecycle. By proactively using recycled materials, consumer goods manufacturers can stimulate demand for them, work to promote consumer understanding of recycling, and contribute to society's transition to a circular economy.

By increasing the use of recycled or bio-based materials in containers while continuing efforts like lightweighting and utilizing alternative materials to reduce virgin plastic usage, our other aim is to decrease the GHG emissions associated with the procurement of packaging materials and their post-use disposal stage.

1-4-5. Biodiversity and Human Rights in Supply Chain

The largest contributor to the Shiseido Group's carbon footprint is the procurement of raw materials. We recognize the importance of reducing GHG emissions related to raw material procurement through collaboration with suppliers, who are crucial partners in our sourcing.

Depending on the material, some involve significant indirect emissions upstream in the supply chain. Palm oil and palm kernel oil, used not only in cosmetic ingredients but also in many products like food and daily necessities, are sourced from palm trees grown in Southeast Asian regions such as Malaysia and Indonesia. Palm plantations are often developed by clearing biodiversity-rich tropical rainforests; Germer et al. report that if 1 hectare of tropical rainforest is developed for a plantation, between 777 and 1,443 t-CO_2e of GHG will be released over the subsequent 25 years due to the land conversion[20]. Analysis using agricultural statistics and inventory databases for LCA indicates that approximately 80% of the forest-to-land conversions associated with the production of our procured materials are highly likely caused by palm tree cultivation.

Therefore, to prevent GHG emissions accompanying such land conversion and to conserve valuable tropical rainforest ecosystems, Shiseido aims to switch all directly purchased palm-derived cosmetic ingredients to RSPO-certified ingredients by 2026. The GHG emissions that can be reduced through this initiative amount to a maximum of approximately 70,000 t-CO_2e annually for cosmetic palm-derived ingredients. In 2025, out of a total procurement volume of approximately 3,300 tons (in palm oil and palm kernel oil equivalents), we switched 87% to Mass Balance RSPO-certified ingredients. Furthermore, as a new target for 2030, we have set the goal of ensuring traceability to the oil mill for 85% of the palm-derived ingredients procured by the Group. Regarding paper, for which we set a target to switch to sustainable paper such as certified or recycled paper by 2023 and have continued initiatives post-achievement, we have established an additional 2030 target to trace plantations down to the provincial/state level alongside utilizing sustainable paper.

Additionally, for soybeans, mica, and conflict minerals—which harbor high deforestation and human rights risks—we have set 2030 targets to source from risk-free countries or regions. By promoting sustainable and responsible procurement and minimizing complex risks related to climate change, nature/biodiversity, and human rights, we will contribute to improving business resilience.

Message from the stakeholder—***FANPS**

Shiseido Group's climate- and nature-related financial disclosure stands at an advanced tier among Japanese corporations. Notably, the company was quick to adopt sophisticated methodologies like LIME3 to assess its extensive value chain, including raw material procurement. By applying a double-materiality lens, Shiseido Group clearly quantifies both its environmental impact and business continuity risks in terms of "external economic costs" and "financial impacts." We highly commend their forward-looking approach to analyzing and disclosing risks and opportunities, which factors in long-term procurement costs and supply chain resilience.

Aligning evidence-based analysis with mid-to-long-term environmental targets and actions not only makes ESG management more effective, but also enhances credibility with investors when they objectively assess a company's long-term earning power. Because securing natural ingredients is vital for cosmetics, transitioning toward net-zero and nature-positive operations is directly tied to business sustainability. Integrating substantive initiatives into core operations—such as procurement of sustainable palm oil and developing reef-safe products—transcends mere CSR marketing. It firmly substantiates corporate resilience and aligns with modern institutional investor requirements.

Moving forward, the key will be presenting a concrete transition plan that fully integrates climate and nature positive action into corporate strategy. Long-term efforts, such as shifting to circular materials, will inevitably involve operational challenges, including adjustments to procurement strategies and sourcing alternative ingredients. Along with these challenges, the transition plan should highlight new business opportunities driven by social value and the interests of future generations, which ultimately strengthen long-term competitiveness. It is equally important to demonstrate clear governance by showing how the Board of Directors and management oversee them. By weaving this narrative into the sustainability strategy of its Medium-Term Strategy, Shiseido Group can become a global role model for ESG leadership, setting an example far beyond Japan

FANPS (**Finance Alliance for Nature Positive Solutions**)

Established in 2023, FANPS is a Japan-based financial alliance dedicated to support corporate transitions toward nature-positive management. The alliance comprises Sumitomo Mitsui Financial Group, MS&AD Insurance Group Holdings, Development Bank of Japan, and the Norinchukin Bank. Leveraging the diverse expertise of these financial institutions, FANPS facilitates the transition by offering a catalog of solutions that outlines nature-positive business models.

Table 3 - GHG Emissions (Unit: metric t-CO_2e)

Scope and Category		Description	Internal data	Emission factor	2019	2025
Scope 1		Direct emissions from operations	Fuel consumption	Reference-1[21]	27,036	17,608
Scope 2		Indirect emissions from energy supplied by others	Electricity/steam consumption	Emission factors provided by power companies	51,714	6,571
Scope 3		Indirect emissions other than Scope 2				
1	Purchased goods and services	Emissions from upstream supply chain (raw materials, packaging, advertising, land use conversion for palm-derived materials and paper)	Procurement volume, POSM volume, media AD expenses, Palm/paper material volume	AIST-IDEA v3.5、Ecoinvent 3.9、Reference-2[20]、Reference-3[22]	1,210,000	402,000
2	Capital goods	Emissions generated when manufacturing capital goods	Capital investment amount	Reference-2	231,000	108,000
3	Fuel- and energy-related activities	Emissions from extraction, refining, and transportation of energy/fuel	Energy consumption	AIST-IDEA v3.5	15,600	7,700
4	Upstream transportation and distribution	Emissions from procurement and outbound transportation	Procurement volume, Transport volume, Distance between factory and retailer	AIST-IDEA v3.5、Ecoinvent 3.9	110,000	63,300
5	Waste generated in operations	Emissions from waste treatment of industrial waste	Waste volume by material and disposal method	AIST-IDEA v3.5	20,700	16,800
6	Business travel	Emissions from employee business travel	Travel expenses, trips by destination, distance	AIST-IDEA v3.5、Reference-2	14,700	5,260
7	Employee commuting	Emissions from employee commuting	Commuting expenses	AIST-IDEA v3.5、Reference-2	5,200	7,210
8	Upstream leased assets	Leased properties (e.g., warehouses)	Electricity/fuel consumption	AIST-IDEA v3.5	0	7
9	Downstream transportation and distribution	Emissions from sales activities and storage	Sales volume, product base area	Reference-4[23]	252,000	88,600
10	Processing of sold products	N/A			0	0
11	Use of sold products	Emissions generated during product use	Energy, water, consumable usage during use	AIST-IDEA v3.5	1,580,000	141,000
12	End-of-life treatment of sold products	Emissions from decomposition of ingredients, transport, and disposal of product waste	Fossil-derived carbon in ingredients/packaging, waste volume by material	AIST-IDEA v3.5	148,000	43,000
13	Downstream leased assets	N/A			0	0
14	Franchises	N/A			0	0
15	Investments	Emissions from unconsolidated affiliates and equity investments	Scope 1 & 2 from affiliates, ownership ratio, Scope 1 & 2 from investments		4,240	1,540

Chapter 2:
Scenario Analysis

2-1. Assessment of Impact Materiality Associated with Business Activities

To financialize the magnitude of environmental impacts related to climate and nature associated with business activities, we conducted a Life Cycle Assessment (LCA) using LIME 3, targeting the Shiseido Group's 2025 activities, including upstream and downstream value chains. While LIME3 provides damage factors for each country or region where environmental impacts occur, for cosmetic ingredients obtained by processing agricultural crops, such as fatty acids and surfactants, the land conversion, land occupation, and water consumption associated with agriculture do not align with the procurement region, but rather occur in the upstream supply chain activity regions.

Therefore, based on supplier interview survey results, FAOSTAT[24)] (agricultural statistics), crop market prices, etc., we mapped the producing countries/regions for each major agricultural crop that serves as a material for procured raw materials in 2023, calculating the land conversion area, land occupation area, and water consumption associated with agricultural production. By supplementarily adding these results as elementary flows, we attempted an analysis that considered regionality for environmental impacts occurring upstream in the supply chain as well. As for analysis conditions, recognizing the reality that GHG emissions in non-developed countries have not decreased, we adopted SSP2-RCP4.5 and used a 1% discount rate for future damage.

The revised and expanded version of LIME 3, released in January 2024, models mammals, birds, amphibians, reptiles, fish, and vascular plants, providing the expected value of the increase in extinct species per 1,000 species over 1,000 years as an endpoint metric for biodiversity loss. In addition to biodiversity loss, LIME 3 calculates human health damage, degradation of social assets due to resource consumption, and inhibition of primary plant production as endpoints, presenting an integrated indicator converted into monetary amounts based on the willingness to pay to avoid such damage.

The LCA analysis revealed that the hotspot for biodiversity impact lies in the raw material procurement stage, and that much of this impact is caused by land development accompanying the cultivation of material crops like oil crops and grains used to manufacture ingredients. This suggested the importance of gathering more detailed information and analyzing agricultural impacts during raw material procurement to grasp the effects of biodiversity loss. Furthermore, integrating the analysis using the willingness to pay based on the population-weighted average of the G20 indicated that the externalized costs caused by the environmental load generated from one year of business activities, converted at 145 JPY to 1 USD, evaluates to approximately 17 billion JPY. Of this, the external cost related to GHG emissions is 10 billion JPY, and water resources is 30 million JPY. As for endpoint damages, human health was evaluated at 3.7 billion JPY, biodiversity at 3.2 billion JPY, social assets at 8.4 billion JPY, and primary plant production inhibition at 2.4 billion JPY.

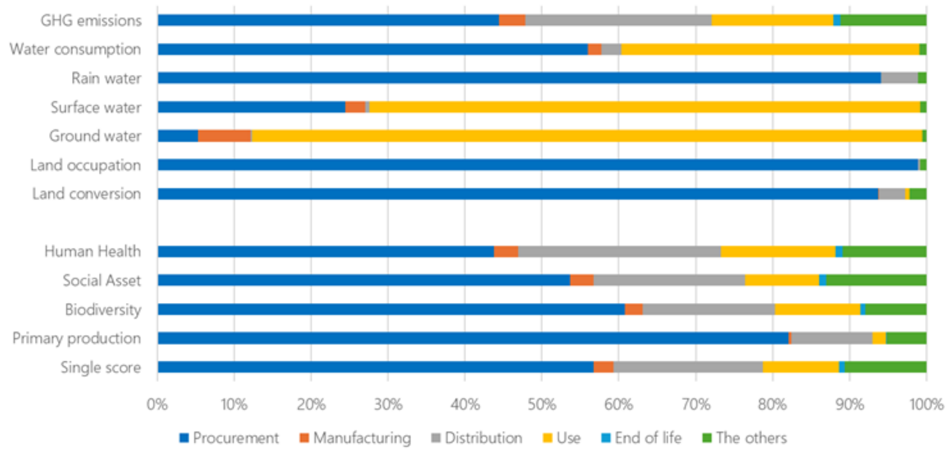

Figure 5 - Environmental Impact Assessment Across the Value Chain Using LIME3

Because the integrated indicator presented by LIME 3 is an implicit societal agreement amount to avoid damage from environmental impacts, it can be interpreted as the financial impact (impact materiality) of the "impact" aspect required for disclosure by the TNFD. Furthermore, being able to identify the magnitude of influence on endpoint damages, including biodiversity loss, by individual factors can also be considered a benefit of LCA.

2-2. Screening of Factors Related to Climate-Related Risks and Opportunities

When considering factors related to climate change, we established virtual scenarios: a 1.5/2°C world (1.5/2°C scenario) where the world unites in mitigation efforts and successfully curbs climate change, and a 4°C world (4°C scenario) where mitigation fails and temperatures rise by 4°C. We analyzed market/social environment changes accompanying societal shifts (transition risks/opportunities) and the effects of natural phenomena caused by rising temperatures (physical risks/opportunities) using RCP and SSP scenarios. Since various events and relationships are conceivable as factors bringing climate risks and opportunities, we conducted a screening of major physical risk factors based on the IPCC Sixth Assessment Report and the Shiseido Group's regions of activity. For transition risks, we extracted impacts centered primarily on policy, regulatory, technological, market, and reputational changes accompanying the shift to a decarbonized society. For physical risks, we extracted impacts from acute/chronic changes such as flood occurrence and weather conditions accompanying rising temperatures.

In the following sections, considering the sustainability and uncertainty of business and assets, and the lifetime of operations/equipment, we detail the results of a quantitative analysis on the financial impacts projected for 2030, based on scientific and statistical data, for the highly impactful items selected from individual risk/opportunity factors presented in the IPCC AR6.

Table 4 - Major Global Physical Risks and Our Areas of Activity

Region	Key Risk	Procurement	Manufacturing	Distribution
Europe	(1) Coastal and inland flooding (2) Increasing temperatures and heat extremes (3) Ecosystem disruptions (4) Water scarcity (5) Losses in crop production	✓	✓	✓
North America	(1) Mental health and mortality (2) Increasing temperatures and heat extremes (3) Ecosystem disruptions (4) Water scarcity and quality (5) Losses in crop production (6) Sea level rising	✓	✓	✓
South America	(1) Water scarcity (2) Infectious diseases (3) Coral ecosystem disruptions (4) Food security (5) Floods (6) Sea level rising	✓		✓
Asia	(1) Human health (2) Floods (3) Ecosystem disruptions (4) Sea level rising (5) Water scarcity (6) Food security	✓	✓	✓
Oceania	(1) Ecosystem disruptions in ocean or alpine area (2) Sea level rising (3) Losses in crop production (4) Increasing temperatures (5) Wildfire	✓		✓
Africa	(1) Ecosystem disruptions (2) Food security (3) Human mortality (Heat and infections) (4) Economic growth and poverty (5) Water scarcity	✓		

2-3. Carbon tax

There are concerns about the financial impacts of carbon pricing during the transition to a decarbonized society. Various systems and frameworks for carbon pricing are being discussed, such as carbon taxes paid according to GHG emissions from activities within target countries, border carbon adjustments applied to goods moving from regions with weak GHG regulations to those with strong ones, and market trading systems like Cap & Trade or ETS (Emissions Trading System).

Currently, in Europe, carbon tax prices are set between 1.5 USD and 145 USD per ton of GHG emission, showing vast disparities among countries[25)]. Since carbon taxes are utilized as financial resources for executing climate mitigation/adaptation measures or compensating for climate disasters, or set as Pigouvian taxes to internalize external diseconomies, it is anticipated that in the near future, the burden amount will be determined by the Social Cost of Carbon (SCC). The International Energy Agency (IEA) projects carbon prices reflecting climate policy implementation costs in 2030 at 120 USD (Announced Pledges scenario) to 130 USD (Net Zero Emissions by 2050 scenario) per ton, but some countries have already applied taxes exceeding these predictions. By 2030, France and Iceland announced they will introduce a 100 EURO tax, and Canada a 170 CAD tax, suggesting the trend of soaring carbon tax prices will likely continue.

Recent years have seen successive publications of studies on SCC, with some reporting appropriate future carbon prices at 500 USD or 1,500 USD[26, 27)]. Accompanying the high pricing of carbon taxes, ETS market transaction prices are also expected to rise, following the carbon tax prices of each country/region.

Based on this current landscape of carbon pricing, we analyzed the financial burden of carbon taxes for the short-term in 2025 by adopting the levels of France, where we have production factories. For medium-to-long-term impacts, we analyzed the annual burden in 2030 using the IEA AP and NZE scenarios. Assuming that by 2030 border carbon adjustments at equivalent prices are introduced within the EU or in all countries where our production factories are located, we evaluated the financial impact based on our forecasted Scope 1 and Scope 2 GHG emissions in 2030 using the following formula:

$$\text{Carbon tax impact} = GHG_{in} * CP_{in} + GHG_{out} * CP_{out} + GHG_{out} * (CP_{in} - CP_{out}) * S_{in}/(S_{in}+S_{out})$$

GHG_{in}: GHG emissions in countries/regions with border carbon tax
GHG_{out}: GHG emissions in countries/regions without border carbon tax
CP_{in}: Carbon tax price in countries/regions with border carbon tax
CP_{out}: Carbon tax price in countries/regions without border carbon tax
S_{in}: Sales volume for products destined for countries/regions with border carbon tax
S_{out}: Sales volume for products destined for countries/regions without border carbon tax

Table 5 - Financial Impact of Carbon Tax Based on NZE Scenario

Scenario	Period	Carbon price	Region	Impact
1	2030	130 USD	EU	53 mil. JPY
2	2030	130 USD	All region	0.87 bil. JPY
3 (w/o renewable energy)	2030	130 USD	All region	2.2 bil. JPY

As a result, if carbon taxes including border adjustments are introduced within the EU in the medium to long term (Scenario 1), an annual burden of approximately 53 million JPY is estimated in 2030. If carbon tax prices of the same level are applied in all countries hosting our factories (Scenario 2), an annual burden of approximately 870 million JPY is estimated. If the level of renewable energy introduction in 2030 remains the same as in 2020 (Scenario 3), an annual burden of approximately 2.2 billion JPY is expected, demonstrating that proactive introduction of renewable energy mitigates financial impact.

At COP27 in 2022, the establishment of a fund to compensate for loss and damage caused by climate change was agreed upon. Long-term, the movement for developing nations to seek compensation for climate disasters from developed nations—who historically emitted massive amounts of GHGs—is expected to strengthen further. According to the Sharm el-Sheikh Implementation Plan[28], 5.8 trillion to 5.9 trillion USD in funding will be required by 2030 for such support to developing nations. Assuming future funding for these losses and damages is sourced from carbon taxes in developed and emerging nations, even if we reduce our Scope 1 and Scope 2 GHG emissions by 95% by 2050, we estimate a burden of approximately 250 million to 840 million JPY annually under the 1.5°C scenario, and roughly 360 million to 1.2 billion JPY under the 4°C scenario.

Carbon taxes also raise concerns about affecting procurement costs, such as raw materials. If a carbon tax is imposed only on primary suppliers, procurement costs will increase based on the proportion of GHG emissions generated by electricity and fuel consumption at the primary supplier. Realistically, it is reasonable to assume that electricity and fuel consumption at upstream suppliers, especially those in carbon tax-implementing countries/regions, will also be subject to the tax. When encompassing all upstream suppliers, the proportion of GHG emissions subject to carbon tax is calculated as the sum of the following infinite series:

$$\text{Carbon tax coverage} = \sum_{n=1}^{\infty}\{(1-x)^{n-1} * x\}$$

x: The proportion of GHG emissions from electricity and fuel consumption relative to the total GHG emissions of raw material manufacturing

If “0 < x < 1”, this infinite series converges to 1. If a global carbon tax is introduced, the entirety of GHG emissions derived from raw material procurement would be taxed; however, at COP discussions, constraints are often primarily demanded of developed countries. Therefore, conservatively assuming that up to Tier 3 suppliers operate in taxed countries, we calculated the carbon tax impact on raw material procurement costs under the IEA NZE scenario. We estimated the proportion of GHG emissions from supplier electricity and fuel consumption out of the GHG emissions of cosmetic ingredients and packaging materials procured by our company, based on our procurement track record, using the life cycle inventory database IDEA.

$$\text{Carbon tax impact} = \left(\sum_{n=1}^{3}\{(1-x_m)^{n-1} * x_m\} * GHG_{C1m} + \sum_{n=1}^{3}\{(1-x_p)^{n-1} * x_p\} * GHG_{C1p}\right) * CP$$

x_m: Proportion of GHG emissions from electricity/fuel consumption in cosmetic ingredient procurement

x_p: Proportion of GHG emissions from electricity/fuel consumption in packaging material procurement

GHG_{C1m}: GHG emissions of cosmetic ingredient procurement

GHG_{C1p}: GHG emissions of packaging material procurement

CP: Carbon tax price

As a result, it is expected that an additional burden of approximately 3.5 billion JPY annually will occur, suggesting the importance of advancing supply chain decarbonization collaboratively with direct and indirect suppliers.

2-4. Floods (Extreme Weather Events)

We evaluated the impact of large-scale 100-year floods accompanying temperature increases. For flood frequency, we adopted the inverse of the return period for large-scale floods under the RCP 2.6 to RCP 8.5 scenarios reported by Hirabayashi et al[29]. As the current flood frequency (as of 2020), we set an initial relative flood risk value based on the disaster database of the Université catholique de Louvain[30], dividing each country's average number of floods per unit area over the 20 years from 2000 to 2019 by Japan's average. We treated the inverse of the return period in 2100 as the annual flood probability, and adopted the sum of the current probability and 1/3 of the difference from the current probability as the flood probability for 2030.

If a large-scale flood occurs in a production factory's river basin, and local municipal hazard maps predict inundation of more than 50cm, we assumed that 50% of the equipment would suffer water damage. We estimated the asset damage and set the total financial impact as the lost shipments resulting from a presumed 1-month production stoppage, referencing Japanese factories during the 2011 Thailand floods. For factories where hazard map inundation predictions are under 50cm, we assumed no equipment damage, but calculated a financial impact of a 3-day production stoppage due to surrounding logistics disruptions and employee commuting difficulties.

Because published return periods are evaluated at a spatial resolution of 0.25 degrees latitude/longitude, locations near grid boundaries could yield heavily fluctuating results from slight positional differences. Therefore, return periods were averaged by river basin for the evaluation. We evaluated all domestic and overseas factories on a facility-by-facility basis and calculated the total as the flood impact amount for the Shiseido Group.

$$f(F_{2030}) = FR_0 * FF_{2030} * (S + C)$$

$$\text{Flood impact} = \sum f(F_{2030})$$

FR_0: Initial value of flood risk

FF_{2030}: Probability of large-scale flood occurrence in 2030

S: Virtual sales of products whose shipment is stopped due to flood

C: Cost of renewing equipment damaged by inundation

As a result, the potential risk from floods under RCP8.5 (4°C scenario) in 2030 was estimated at approximately 870 million JPY annually, of which approximately 150 million JPY was evaluated as the impact from climate change. Particularly in Japan, where production factories are concentrated, flood impacts are predicted to increase toward the end of the century, highlighting the importance of formulating BCPs (Business Continuity Plans) for water disasters and implementing countermeasures such as inundation forecasting from a long-term perspective. Over a longer term, climate change impacts are predicted to increase significantly, with potential risk in 2100 evaluated at several times higher than in 2030; however, uncertainties across all aspects of the business environment—including socioeconomic and technological factors—are vast, rendering it meaningless as a realistic risk prediction.

Because extreme weather phenomena greatly affect logistics as well as factory production, we investigated flood risks for logistics hubs in Japan where flood risk is expected to significantly increase over the next 100 years. For domestic logistics hubs, we confirmed low actual inundation risk by conducting the aforementioned climate model flood frequency analysis and investigating inundation predictions using municipal hazard maps. For overseas production factories and logistics hubs, since detailed hazard maps provided by municipalities/local governments are sometimes unavailable unlike in Japan, we are considering detailed analysis methods based on topographical information.

2-5. Drought and water shortage

Our company operates 11 factories in Japan, France, the US, China, and Taiwan, utilizing approximately 550,000 m^3 of water resources annually. While baseline water stress indicators are often used for evaluating water scarcity and physical risks, they face criticisms—such as evaluating the ratio of water volume to usage regardless of river scale, and not accounting for the water volume required by aquatic ecosystems.

To resolve these issues, we evaluated the water environments of our production factories' river basins using the characterization factor AWARE (Available Water Remaining per area in a watershed) [31], supported by the UNEP/SETAC Life Cycle Initiative, which indicates the relative volume of available water remaining after satisfying aquatic ecosystems and societal demand. A value of AWARE = 1 signifies the global terrestrial average. The Beijing factory in China was evaluated as being located in a region with higher water scarcity than the global average. Meanwhile, even in regions currently blessed with water, climate change is expected to reduce rainfall, or populations might increase remarkably in the future. Therefore, in this section, we evaluated how access to freshwater resources changes due to rainfall reduction and population dynamics caused by climate change, and how production factory operations would be impacted as a result.

Table 6 - Water Withdrawal at Factories in 2025

AWARE	Area	Withdrawal (000 m^3)	
		Tap water	Ground water
1<	Japan France USA Taiwan China (Shanghai)	347	170
≧1	China (Beijing)	20.8	0

According to the Ministry of Land, Infrastructure, Transport and Tourism's "Current Status of Water Resources in Japan 2021[32]", in a survey covering approximately 170 locations nationwide, water supply restrictions were implemented 590 times due to droughts over the 30 years from 1991 to 2020. Of these, long-term restrictions occurred 40 times, spanning 2,865 days. This equates to 96 days of water supply restrictions per year. Assuming short-term restrictions last 7 days per instance, they are implemented for 128 days annually. If we assume the loss of factory production capacity due to short-term and long-term restrictions to be 10% and 100% respectively, we can set the current potential drought risk for factories in Japan at a 0.041% loss of production capacity. For overseas factories, we adopted an initial risk weighted by the Water Unavailability Factor f_{wua} of surface water developed by Yano et al. [33], using Japan's initial drought risk as a standard. The f_{wua} is provided per country or at a 0.5-degree spatial resolution as a characterization factor that weights water scarcity by the land area required to collect $1m^3$ of rainwater, surface water, and groundwater, respectively.

For fluctuations in water resource availability as of 2030, we used the relative change rate in rainfall from 2011 to 2040 under the RCP2.6 to 8.5 scenarios reported by Hanasaki et al.[34] Because published rainfall change predictions use a 0.5-degree spatial resolution, we averaged the rainfall change rates by river basin for evaluation to prevent significant fluctuations at grid boundaries. Since access to water is also affected by the population utilizing it, we adopted the population change rate of the country/region where the factory is located as an explanatory variable for a water resource competition analysis model, based on the UN's medium demographic projection scenario[35]. Rainfall change and population dynamics were weighted with a 9:1 ratio for their impact on risk.

Because rainfall changes exhibit interannual variation, mitigation effects from reservoirs like dams are expected, and factory water supplies may be halted during severe droughts exceeding a certain threshold (keeping risks high), the impact of droughts is not linear. We set a risk function drawing a sine curve between the threshold where impacts begin to manifest and the threshold where they are maximized.

We adopted the reciprocal of the standard deviation σN of rainfall fluctuation rates against average rainfall in years without long-term supply restrictions over the past 30 years as the threshold where impacts begin to manifest, and a decrease equivalent to 3σL (σL being the standard deviation in years with long-term restrictions) as the threshold where impacts are maximized. Using the following formula, we modeled the relative change in drought risk against the initial risk. We evaluated all domestic and overseas facilities individually, calculating the financial impact as the damage from factory stoppages, and summed them as the Shiseido Group's total water shortage impact.

$$f(P) = (\sin((TP_{min} - P) / (TP_{min} - TP_{max}) * \pi - \pi / 2) + 1) / 2$$

$$f(D) = (\sin((TD_{min} - D) / (TD_{min} - TD_{max}) * \pi - \pi / 2) + 1) / 2$$

$$\text{Drought impact} = \sum \{R * (0.9 * f(P) + 0.1 * f(D))\} * S$$

P: Relative change rate in rainfall from 2011 to 2040

D: Population growth rate from 2011 to 2040

R: Magnitude of initial risk

TP_{min}: Threshold of rainfall decrease rate where impact begins

TP_{max}: Threshold of rainfall decrease rate where impact is maximized

TD_{min}: Threshold of population growth rate where impact begins

TD_{max}: Threshold of population growth rate where impact is maximized

S: Sales of products shipped from the evaluated factory

As a result, the potential financial impact of water shortages in 2030 under RCP8.5 (4°C scenario) was estimated at approximately 3.2 billion JPY, but it was evaluated that the risk strictly from climate change would decrease by approximately 10 million JPY. This is because in Japan, which is our production center, rainfall is expected to trend upward toward the end of the century, and population decline is anticipated, which is expected to ease competition for water resources. Conversely, high potential risks were evaluated in China, which is already under high water stress, and Europe, where rainfall decreases are predicted to continue, necessitating careful water risk management centered on these regions.

For this reason, aiming to manage drought risk from a long-term perspective, we selected water consumption at our business sites as a metric and set a long-term target to reduce it by 50% (per sales unit) by 2030. Focusing on factories with high water usage, we are striving to mitigate risks and alleviate impacts on river basin environments through the introduction of water-saving and water-recycling equipment. Over a longer term, climate change impacts are predicted to increase significantly, with potential risk in 2100 evaluated at roughly double that of 2030. However, similar to the flood risk evaluation, uncertainties across all aspects of the business environment are massive, rendering realistic risk predictions meaningless.

As a pioneering initiative in basin management of water resources, the Nasu Factory has initiated surveys of the water environment across the entire composite alluvial fan area called as "Nasu-no-ga-hara". A 2023 survey included field investigations of surrounding rivers and computer simulations of surface and groundwater flows based on geological and statistical data. This revealed the geological feature that the entire Nasu-no-ga-hara is an alluvial fan composed of highly permeable gravel, where most precipitation infiltrates underground, making surface water difficult to obtain—explaining its historical background as a difficult area for agriculture until modern water infrastructure was established. In 2024, we conducted more detailed flow surveys, including seasonal fluctuations, of surface waters upstream and downstream of the factory, alongside measurements of water infiltration from downstream farmlands. We collaborated extensively with various stakeholders, including experts, municipalities, land improvement districts, local farmers, and agricultural high schools. These surveys revealed that surrounding groundwater is abundant, the factory's groundwater extraction has a limited impact on surrounding flows, and the factory's wastewater has extremely minimal impact on the water quality and flow of the waterway before merging with the Sabi River. Since the factory discharges wastewater into the river, the water used in production undergoes a 4-stage purification process (including physical and chemical treatments), is stored in a tank for water quality checks as a precaution, and is only

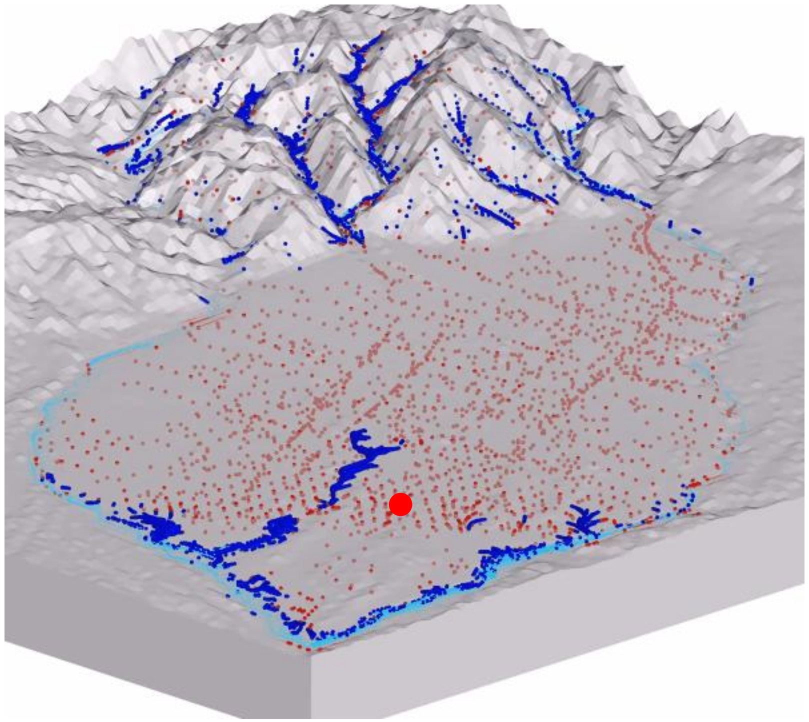

Figure 6 - Surface Water● and Groundwater● Flow in Nasu-no-ga-hara
(Nasu factory is marked with a ●)

discharged thereafter. Should it fail standards, it undergoes purification again; since operations began in 2019, such an instance has never occurred. In 2025, the factory joined the municipal Nature Positive Nasu-no-ga-hara Alliance. Moving forward, we aim for sustainable water resource use at the regional/basin level by not only conserving water and managing wastewater quality but also striving to understand total water inputs/outputs and the intake/discharge statuses of the entire basin society, while deepening stakeholder cooperation.

2-6. Raw Material Procurement

Many of the cosmetic ingredients purchased by Shiseido are made from plants, and rainfall changes accompanying climate change will affect the procurement of these raw materials. Therefore, based on actual material procurement data from 2019, we used the Water Footprint methodology[36)] to analyze where and how much water is invested in cultivating raw material crops. We analyzed the sustainability of this water resource usage using the average rainfall change rates and national population dynamic forecasts up to 2100, identifying material crops that would be significantly affected by weather changes.

Next, we analyzed the procurement cost increase caused by the destabilization of agricultural production for palm, the most widely used material crop in our cosmetic ingredients. First, from our 2019 procurement records, we identified raw materials containing ingredients derived from palm oil or palm kernel oil, such as glycerin and fatty acids. We calculated the total weight of the parts assumed to be derived from these oils and estimated the equivalent volumes of palm and palm kernel oil to be procured in 2030 by factoring in increased procurement volumes accompanying business growth.

Next, we conducted a regression analysis based on monthly market transaction prices of palm oil and palm kernel oil over the past 25 years (1997–2021), obtaining the rise in average prices, the standard deviation of price fluctuation ratios against the average, and the frequency at which transaction prices exceeded the average. From these trends, we determined the expected average prices for 2030, assumed the contribution of extreme weather to price upswing frequency to be 0.5, and calculated the potential price increase amount under the premise that the destabilization of production due to climate change would increase the frequency of above-average price spikes.

As the increase margin for the frequency of production destabilization, we used the sum of the change rates in the occurrence frequency of 10-year droughts, heavy rains, and heatwaves reported in the IPCC AR6. Since the report provides occurrence frequency predictions for extreme weather in 2100, we assumed a linear increase from 2020 to 2100 to determine the 2030 frequency under 1.5/2°C (RCP 1.9, RCP 2.6) and 4°C (RCP 8.5) temperature rises. By multiplying the expected average price and expected procurement volume in 2030 by the standard deviation of price fluctuations and the occurrence ratio of extreme weather, we evaluated the potential price increase due to climate change as the procurement risk.

$$\text{Procurement impact} = A_{2030} * P_{2030AVE} * \sigma * R_{AW}$$

A_{2030}: Expected procurement volume in 2030

$P_{2030AVE}$: Expected procurement volume in 2030

σ : Standard deviation of fluctuation ratio against moving average price

R_{AW}: Occurrence ratio of price upswings due to extreme weather

As a result, the cost increase due to climate impacts in 2030 was estimated at approximately 140 million JPY under the 1.5/2°C scenario, and approximately 290 million JPY under the 4°C scenario. We recognize the importance of grasping and avoiding risks by advancing sustainable palm oil procurement and conducting quantitative financial impact analyses for non-palm material crops that also face significant concern. Furthermore, since climate change may not only lead to future procurement cost increases but also make procurement itself impossible, it is vital to implement countermeasures to avoid or reduce risks for highly affected materials, such as changing materials or dispersing production locations.

2-7. Screening of Factors Related to Nature and Biodiversity

Compared to GHG emissions—where 1kg of CO_2 emitted anywhere on Earth is treated identically regarding radiative forcing—issues involving biodiversity and ecosystems differ vastly in that countless regional problems aggregate to form a global issue. While there are many reports on the impacts of economic activities and climate change on biodiversity, there are extremely few cases demonstrating quantitative, macro-level correlations regarding the impact of biodiversity loss on society and economic activities in the cosmetics and personal care sector. Therefore, as a screening of factors related to ecosystem services, we used ENCORE (Exploring Natural Capital Opportunities, Risks and Exposure) [37)] provided by the Natural Capital Finance Alliance to identify ecosystem services highly relevant to the business activities of the personal care industry, including cosmetics.

Table 7 - Dependence on Nature Indicated by ENCORE

Factor	Shiseido's activity
Dilution by atmosphere and ecosystems	Chemical spills due to accidents, discharge of ingredient components into the environment after use
Materials such as fibers	Raw material procurement
Surface water	Cultivation of raw material crops, manufacturing of raw materials, product manufacturing/equipment cleaning, product use
Groundwater	Raw material production, Product manufacturing/equipment cleaning, Product use

Table 8 - Impact on Nature Indicated by ENCORE

Factor	Shiseido's activity
Water use	Cultivation of raw material crops, Raw materials production, Manufacturing, Use of products
GHG emissions	Energy consumption, Activities on the value chain
Non-GHG air pollutants	NOx, SOx, and PMs from fuel combustion
Water pollutants	Eutrophication, Acidification, Heavy metal
Soil pollutants	
Solid waste	Waste from our business, Waste from sold products

As a result, it was indicated that we should consider the impacts of raw material procurement and production activities for both dependence on and impact on ecosystem services. Among these, the impact of water resource usage in production overlaps with the drought/water shortage risk of climate-related risks; therefore, the following sections detail the direct impact of production sites on biodiversity, and the indirect impacts of water and land use during raw material procurement in the value chain.

2-8. Biodiversity Around Our Sites

Although the relative impact is small within the entire value chain, grasping and minimizing the ecosystem impact of land occupation by our own sites is important from the perspective of land management responsibility. The TNFD Framework v1.0 requires identifying ecologically sensitive locations and material locations (places determined to be important from the perspective of nature-related dependencies, impacts, risks, and opportunities) and organizing them as priority locations in L2 and L3 of the LEAP approach. Therefore, with the support of MS&AD InterRisk Research & Consulting, Inc., we identified sensitive locations among our production sites with large footprints, viewing them through the lenses of biodiversity importance, biodiversity integrity, and the importance of ecosystem service provision.

Table 9 - LEAP Approach

L Locate	Understand the relationship between the company's activities and nature, including regional characteristics
E Evaluate	Analyze the magnitude of the company's impact on nature and dependence on nature
A Assess	Identify risks/opportunities the company's activities pose to nature, and risks/opportunities nature's degradation pose to the company
P Prepare	Set KPIs and targets, engage in nature conservation and recovery to minimize risks and to maximize opportunities, and disclose these actions

The importance of biodiversity was evaluated by "Proximity to Protected Areas" and "Integrated Taxon Conservation Priority." "Proximity to Protected Areas" evaluated the management categories of adjacent protected areas based on the World Database on Protected Areas (WDPA) [38] and Key Biodiversity Areas (KBA) [39] within a 100m and 1,000m radius of the business sites. "Integrated Taxon Conservation Priority" was evaluated based on data from Think Nature Inc., calculating the relative importance of biodiversity at each site from the perspective of vertebrate and tree species composition. This utilized Red List data from the IUCN and the Ministry of the Environment as reference, combined with predictive probability data of species habitats developed by Think Nature Co., Ltd.

Biodiversity integrity and the importance of ecosystem service provision were evaluated from both "Ecosystem Naturalness" and "Development Pressure" around the sites. "Ecosystem Naturalness" was evaluated based on the methodology of Tim Newbold et al. [40], layering habitat conditions using habitat and natural forest distribution data from Think Nature, and applying an index multiplied by the Mean

Species Abundance. "Development Pressure" was evaluated using the Human Footprint Index by H. Mu et al. [41], which indicates how much the environmental impact of human activities increased or decreased between 2000 and 2020.

In identifying material locations, we evaluated water resource use and land use from the perspective of our business activities' dependence on and impact on nature. For water resource use, we calculated the environmental impact of direct water use by weighting the actual tap water (surface water) and groundwater usage in 2023 with AWARE. For groundwater evaluation, we used the groundwater/surface water ratio of the Water Unavailability Factor f_{wua} multiplied by AWARE as a weighting coefficient at each location. Land use was evaluated by multiplying the area of each site minus its green space by the "Integrated Taxon Conservation Priority" and the land occupation characterization factor from Environmental Footprint v3.1[42]. The resulting environmental impacts of water use and land occupation were integrated using normalization and weighting factors from Environmental Footprint v3.1[42] to serve as an evaluation index for material locations.

Table 10 presents the heat map created based on these evaluations. The results confirmed no areas where both the importance and integrity of ecosystems were high. Regarding relationships with nature, as shown in 2-5, the Beijing Factory, located where water resources are highly scarce, scored relatively high compared to other sites. It must be noted that this heat map shows relative values between sites, not the absolute magnitude of the load.

Table 10 - Biodiversity Status and Endangered Species Habitat Status of Production Sites and Surrounding Areas

Site name	Country/ Region	Sensitive loction					Material location		
			Ecosystem Inportance		Ecosystem Integrity				
			Geography	Biology	Biodiversity Intactness	Development pressure		Water	Land use
Kakegawa	Japan								
Osaka	Japan								
Osaka ibaraki	Japan								
Nasu	Japan								
Fukuoka kurume	Japan								
Shiseido Cosmetics Manufacturing Co., Ltd.	China								
Shiseido Liyuan Cosmetics Co., Ltd.	China								
Taiwan Shiseido Hsinchu Factory	Taiwan								
Shiseido America Inc. East Windsor Factory	USA								
Val de Loire Factory	France								
Gien Factory	France								

Alongside identifying sensitive locations, we surveyed endangered species around the factories using the IUCN Red Data Book[43)] and the Ministry of the Environment's Red List. Beyond listed vertebrates[44)], a decline in honeybees is a recent concern in France, where two of our factories operate. To solve such region-specific problems, these factories have stopped using pesticides on-site and installed beehives to protect the bees. At the Kakegawa Factory, where mixed forests of chinquapin and oak cover about 17% of the site, healthy ecosystems were confirmed in 3.5 hectares of green space, leading to its certification as a "Nature Symbiosis Site" by the Ministry of the Environment in 2024. Through green space conservation and regular monitoring, the site serves as an employee welfare benefit, a relaxation spot for locals, and a nature education venue for children attending the on-site "Kangaloom Kakegawa" daycare. We are advancing ecosystem conservation efforts, including for endangered species, tailored to the unique circumstances of each region.

Figure 7 - Green Space Certified as a Nature Symbiosis Site at Kakegawa Factory

2-9. Biodiversity Impacts Related to Raw Material Procurement

Generally, many cosmetic ingredients such as surfactants and moisturizers are classified as chemicals, but in reality, all or part of these components often utilize biomass resources of agricultural products. Since packaging also uses many biomass resource-derived materials like paper and bio-based plastics, it is critical to conduct analyses considering the characteristics and regionality of individual ingredients for raw material procurement, which heavily impacts biodiversity.

To conduct a more detailed evaluation of upstream supply chain biodiversity damages, we participated in the "Development and Demonstration Project of Nature Footprint Premised on Financial/Investment Institution Nature-related Information Disclosure Promotion and International Standardization" (hereinafter "Nature Footprint Project") initiated by the Cabinet Office's BRIDGE program in October 2024. The project aims to develop evaluation methods addressing both impact and dependence by incorporating species extinction risks and economic valuations of ecosystem services into LIME3, an LCA evaluation method. It also aims to apply the developed method to corporate nature/ecosystem evaluations and for investors to utilize the results in ESG investing, drawing wide participation from academia, industry, and finance. In FY2024, the development of a damage coefficient for E/MSY (Extinct species per Million Species-Years) was advanced to evaluate impacts. The evaluation model for species extinction due to land use conversion and climate change was updated, and a new biodiversity impact evaluation from water resource consumption—previously not incorporated in LIME3—was introduced.

As part of the LEAP approach's "L" and "A" investigations, for cosmetic ingredients we procured in 2024 that were processed from crops (such as oils, fatty acids, higher alcohols, surfactants, moisturizers, and alcohols), we attempted to estimate the crop volumes and production countries/regions required to produce the procured amounts. For ingredients where supplier interview results existed, those results were prioritized. For ingredients lacking such primary data, we estimated crop volumes by country/region after considering availability inferred from production, import/export, and market price data, alongside the consistency between the ingredient's molecular structure and crop component compositions. Note that for materials like plant extracts and natural fragrances, where inferring material inputs during manufacturing is difficult, this geographical tagging and inventory correction was not applied. Next, we estimated land use and irrigation water consumption during crop cultivation based on FAOSTAT, Water Footprint Network reports[45)], and Joep F. Schyns et al.'s report[46)].

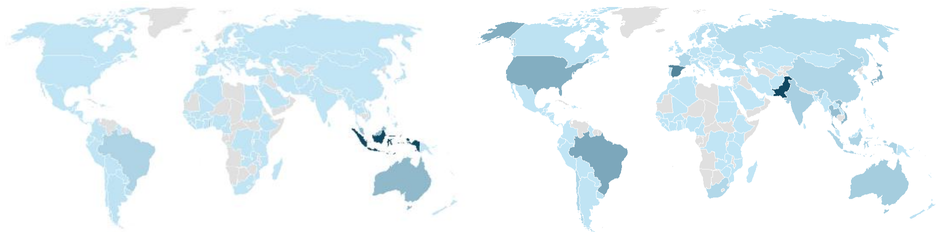

Figure 8 - Land Conversion (left) and Irrigation Water Consumption (right) Related to the Procurement of Agricultural-derived Ingredients

For agricultural land use data, we enhanced the reliability of the analysis by overlaying satellite image data[47)] analysis onto FAOSTAT statistical data.

Based on this inventory analysis, we evaluated the biodiversity damage (E/MSY) across the value chain using the newly developed Nature Footprint damage factor (Ver. 1) from the Nature Footprint Project. Shiseido previously set a goal to switch to sustainable paper, such as certified or recycled paper, for product cases and instruction manuals by 2023. We have already completed the switch for target materials and continue to use sustainable paper as of 2025. Furthermore, for palm-derived cosmetic ingredients, we aim to switch all directly purchased ingredients to physically certified RSPO ingredients by 2026, making steady progress toward this goal with supplier cooperation. This analysis clearly showed that most potential upstream biodiversity impacts from land conversion originate from paper and palm-related raw materials, and that switching to certified materials suppresses land conversion, thereby mitigating biodiversity impacts.

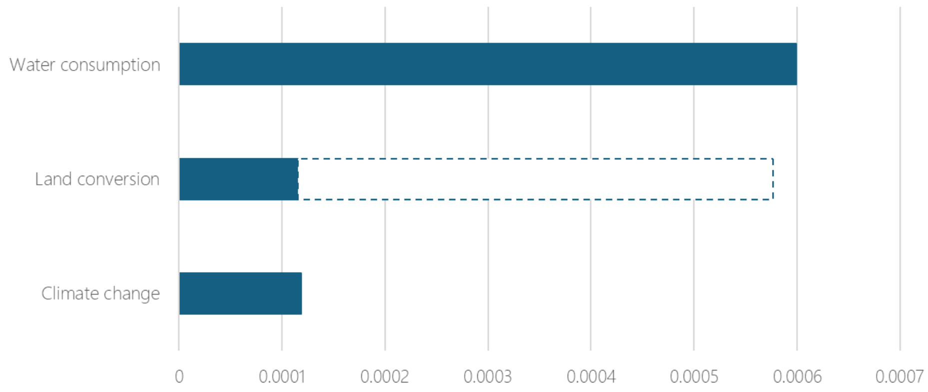

Figure 9 - Nature Footprint Across the Value Chain (E/MSY)

In Section 2-1, using organizational LCA based on LIME3, we evaluated the negative external diseconomies from our business activities at approximately 17 billion JPY. However, if we had not executed the switch to sustainable materials for paper and palm-related ingredients, it would be calculated at approximately 21 billion JPY. In other words, by switching to sustainable materials, we successfully mitigated approximately 3.2 billion JPY worth of damage regarding biodiversity and primary plant production inhibition (loss of ecosystem services).

Currently, various entities provide tools to visualize water and biodiversity risks. However, a problem exists in that there are no tools capable of evaluating the mitigation effects resulting from a company's efforts in water conservation or biodiversity protection. We increased the resolution of the impact aspect on biodiversity by developing a unique method that extrapolates upstream supply chain geographical information based on supplier and statistical data onto the existing LCA framework. Consequently, we reconfirmed that paper and palm materials are priority areas among procurement activities with large biodiversity impacts, and simultaneously, we could demonstrate the environmental impact mitigation effects of our strategic action of switching to sustainable materials. This analysis result is expected to yield a certain improvement in the motivation of internal and external stakeholders involved in nature and biodiversity activities, as well as the reliability of explanations given to society, including investors.

Conversely, there are rare ingredients contained in plants at levels of 1% or less. Normally, in LCA, when multiple products are produced from a single raw material, the environmental impact is allocated among the products based on physical quantities or economic value. However, the crop volume corresponding to the environmental load calculated by proportional allocation is significantly smaller than the actual crop volume required to cover the procurement of the rare ingredient. When evaluating business resilience or risk, care must be taken that risk may be underestimated by product-based proportional allocation. To avoid this, in addition to normal LCA evaluations, our company concurrently conducts evaluations without proportional allocation, treating the total crop volume required to produce our procured cosmetic raw materials as our environmental impact. We expect that the understanding and discussion among users of disclosed information, such as investors, will deepen regarding which evaluation methods are more appropriate to adopt in climate- and nature-related disclosures.

Through such inventory analyses incorporating upstream geographical information and the subsequent Nature Footprint evaluations, we can now grasp the entire picture coherently from "Locate" to "Prepare," including not only activities at our own sites but also indirect environmental impacts across the value chain. We are exploring the possibility of effective indexing for mitigating and regenerating biodiversity impacts utilizing this new method. We presented these findings to a global audience at the seminar titled "Nature Footprint -Development and Application for Nature-related Life Cycle Assessment-" Organized by the Ministry of the Environment, Government of Japan, the seminar was held at the Japan Pavilion during the 30th UN Climate Change Conference (COP30) in Brazil in November 2025.

Figure 10 - Reporting at COP30

Conversely, there are rare ingredients contained in plants at levels of 1% or less. Normally, in LCA, when multiple products are produced from a single raw material, the environmental impact is allocated among the products based on physical quantities (like weight) or economic value. However, the crop volume corresponding to the environmental load calculated by proportional allocation is significantly smaller than the actual crop volume required to cover the procurement of the rare ingredient. When evaluating business resilience or risk, care must be taken that risk may be underestimated by product-based proportional allocation. To avoid this, in addition to normal LCA evaluations, our company concurrently conducts evaluations without proportional allocation, treating the total crop volume required to produce our procured cosmetic raw materials as our environmental impact. We expect that the understanding and discussion among users of disclosed information, such as investors, will deepen regarding which evaluation methods are more appropriate to adopt in climate- and nature-related disclosures.

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2-10. Dependence on Biodiversity

As an example of "dependence" on biodiversity, the functions of pollinators, such as bees and weevils, in the production of agricultural products that serve as raw materials are well known. The FAO proposes methods to calculate the value of pollinators[48]: an evaluation method based on the additional costs of substituting them with other pollinators or human labor, and an evaluation method based on the financial loss accompanying supply-demand changes if pollinator functions are lost. This can be interpreted as a business risk when biodiversity is lost and ecosystem services by pollinators no longer function sufficiently.

Therefore, aiming to quantify biodiversity-related risk, we estimated the crop volumes required to produce raw materials from our 2023 procurement records and monetized our dependence on pollinators using the FAO methodology. The result estimated our dependence on pollinators at approximately 2.6 billion JPY annually.

However, services provided by these pollinators represent only a fraction of our dependence on biodiversity. If one attempts to germinate a plant seed in an entirely sterile environment utterly lacking biodiversity, a clumsy introduction of mold will easily allow the mold to kill the seed. It is no exaggeration to say that the ability of a plant to sprout and grow in soil inhabited by numerous bacteria and fungi is a blessing of biodiversity, which creates a balanced competitive state among various organisms. Plant-derived ingredients are formulated into almost all our products; in a broad sense, all our sales depend on biodiversity.

2-11. Geopolitical Risks

In 2021, while Asian countries were accelerating their move away from coal, a fuel shortage problem became apparent, primarily in Europe, compounded by economic stagnation from the Covid-19 pandemic. Global natural gas supply shortages rapidly heightened dependence on specific natural gas-producing countries, becoming one factor that sparked international conflict. At a glance, military conflicts and climate seem unrelated, but decarbonization is closely tied to each nation's energy security. While the global spread of renewable energy will promote local consumption and bring stability in the long term, in the short term, it serves as a factor that destabilizes international energy supply and demand balances.

Furthermore, due to the civil war in the Middle East in 2011, the acceptance of refugees remains a major social issue in Europe today. One cause of this civil war was the influx of rural people into cities after they lost their incomes when several years of severe drought caused catastrophic damage to local agricultural production; climate model analyses[49] suggest that this drought was caused by climate change. The breakdown of risks related to such conflicts and civil wars includes:

1. Opportunity loss due to the cessation of production and sales activities in the conflicting countries.
2. Increased procurement costs due to supply shortages of raw materials and energy produced in the conflicting countries.
3. Decreased sales in neighboring countries due to economic stagnation.

Because the potential financial impact of civil wars and conflicts—such as the loss from halted sales activities in conflict-related regions—depends on the scale and duration of the conflict and the economic size of the related regions, it can become extremely massive in some cases. Additionally, if social infrastructure is extensively damaged, the impacts are expected to prolong even after the conflict ends.

Recognizing such geopolitical instability factors and energy supply-demand imbalances as new climate-related risks, analyzing the magnitude of their potential impacts, and considering countermeasures is a critical future task.

2-12. Expansion of Opportunities Due to Climate Change and Nature Condition

In the 4°C scenario, where temperatures rise remarkably, sales opportunities for products used in the summer expand. Focusing on cell surface membrane structures, Shiseido elucidated a mechanism by which cooling ingredients like menthol impart a cooling sensation more effectively and sustainably[50)]. Cooling products based on such knowledge and technology are expected to see expanded sales opportunities not only in Japan and Asia but also in European regions, which have suffered significant heatwave damage in recent years.

Furthermore, the Japan Agency for Marine-Earth Science and Technology (JAMSTEC) announced a prediction that UV radiation reaching the Earth's surface in mid-latitude regions of the Northern Hemisphere, where megacities like Tokyo and Beijing are concentrated, will increase toward the end of the century due to various environmental factors including climate change. Beyond UV radiation, rising temperatures also increase opportunities for outdoor leisure, which is expected to lead to expanded sales of UV protection products and skincare products for UV-damaged skin[51)]. Therefore, we conducted a regression analysis on sunscreen sales in Japan and Japan's average temperatures from 2020 to 2025, discovering a correlation where sales improve dependently on temperature. From the average temperature rise due to climate change and the regression analysis results, it was suggested that temperature rises will lead to approximately 1.6 billion JPY in expanded opportunities by 2030.

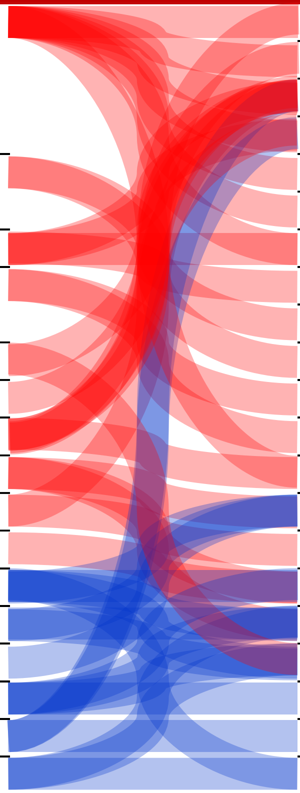
We concurrently forecast how future social and environmental changes related to nature, including climate change and biodiversity, will affect consumer behaviors and needs, and how these changes can turn into opportunities. While uncertainties in the related parameters for opportunities are large and quantitative analysis has not been achieved for factors other than expanded sunscreen sales from rising temperatures, we hope to share information and debate with internal and external stakeholders to improve reliability and accuracy, expanding the scope of evaluations and maximizing opportunities.

2-13. Nexus between Drivers and Business Impacts

The factors constituting climate and nature-related risks and opportunities are not independent variables; they are intricately connected. For example, climate change is a direct business risk factor in that it increases the probability of weather disasters like large-scale typhoons; conversely, temperature rises cause temperature-sensitive organisms like bees to lose or move their habitats, destabilizing agricultural production through ecosystem impacts, which can indirectly act as a factor weakening the supply chain. Conversely, natural forest logging accompanied by biodiversity loss causes the release of carbon stored in the soil, acting as a factor accelerating climate change—causes and effects can provide various positive and negative feedbacks mutually. While perfectly understanding the complex relationship (NEXUS) between human economic/social activities (including our business) and Earth systems (including climate and biodiversity) is difficult, unraveling and organizing it as much as possible is indispensable for understanding and addressing these risks and opportunities. Therefore, centering on the factors identified in previous sections, we organized the relationships between physical and transition factors regarding climate change, and factors related to ecosystems, water, and resources. We classified the magnitude of their impact into short-term (under 1 year), medium-term (1-5 years), long-term (5-10 years), and super-long-term (over 10 years) based on the time scale over which related events manifest. We share information on the obtained risks and opportunities with internal and external stakeholders to connect them to appropriate responses.

Table 11 - Relationship of Climate and Nature-related Risks and Opportunities

Trigger						
Physical driver	Acute	Climate change				Extreme weather event
	Chronic	Climate change				Temperature rising
		Climate change	Water			Drought
		Climate change				Sea level rising
		Climate change			Resource	Resource deprition
		Climate change	Water			Instability in agriculture
		Climate change	Water		Resource	Geopolitical instability
		Climate change	Water	Biodiversity	Resource	Pollution
		Climate change		Biodiversity		Biodiversity loss
		Climate change		Biodiversity		Land footprint increasing
Transitional driver	Market	Climate change	Water	Biodiversity		Consumer awareness change
		Climate change	Water	Biodiversity		Market change
		Climate change	Water	Biodiversity		Reputation decline
	Regulation	Climate change	Water	Biodiversity	Resource	Current/Emerging regulations
		Climate change		Biodiversity		Environmental taxation
	Technology	Climate change	Water	Biodiversity	Resource	New technology and innovations



Effect on Business	Time scale: Near to mid	Time scale: Long	Time scale: Super-long
Disruption of supplichain			+
Disruption of logistics			+
Increase in procurement costs	+	+	++
Increase in operation costs	+	+	++
Increase in insurance costs			+
Damage to facilities			+
Suspension of production activities	++	++	++
Costs for securing water resource			+
Health damage on emploees			+
Deterioration of product quality			+
Relocation of business sites			+
Decline in real estate prices			+
Suspension of sales activities	+	+	+
Increase or decease in product sales		+	+
Loss of innovation opportunities		+	+
Additional information disclosure	+	+	+
Sustainable and safe ingredients	+	+	++
Sustainable and circular packaging	+	++	++
Renewal of equipment	+	+	+
Additional tax burden		+	++
Sustainable brand marketing	+	+	++

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