Kao Corporation
Accenture Japan Ltd

Business Risk and Opportunity on Biodiversity
- TNFD case study with Location analysis-

Preface

As it is clear from the planetary boundaries, the loss of biodiversity is an urgent societal challenge that, along with the climate crisis, will determine the future of humankind. At the international level, discussions are ongoing at the Conferences of the Parties (COP) to the Convention on Biological Diversity. As the loss of biodiversity progresses, the expectations for companies and the roles they should play are getting more significant.

The financial disclosure framework for biodiversity by "Taskforce for Nature-related Financial Disclosures" explains that its aim is to *support a shift in global financial flows away from nature-negative outcomes and toward nature-positive outcomes*. But from the perspective of corporate actions, this means nothing less than increasing resilience to biodiversity risks, discovering new business opportunities, and promoting innovation oriented toward corporate growth.

However, even companies that have already grappled with the climate crisis may be confused about biodiversity. While the climate crisis progresses globally and has the common "yardstick" of greenhouses gas emissions, biodiversity loss is a local challenge. Another reason is that the targets are wide-ranging, which means there simply is no common "yardstick." From the perspective of human rights, Climate Justice is emphasized in the climate crisis. In the same way, the burdening of Global South on a worldwide scale needs to be viewed as a local issue in biodiversity, and the rights of people living in those regions should be respected and dealt with appropriately. Furthermore, when considering measures to address climate crisis and biodiversity, some specific actions may affect each other and result in trade-offs. This characteristic of biodiversity is thought to complicate substantial actions toward problem-solving.

This report presents multiple unique visions of the future, based on scenario analysis that shows different patterns of changes in biodiversity and climate crisis. It should serve as valuable guide in tackling biodiversity. We hope that backcasting approach from future scenarios will help to understand the gap between the business as usual and ideal future and be useful for the discussion in corporate strategy.

This year is a crucial year for curbing the rapid degradation of biodiversity and aiming for a nature-positive world by 2030. The "Taskforce for Nature-related Financial Disclosures" (TNFD), a framework for financial disclosures that assesses the value of nature and seeks to show its impact on companies' operations, will officially start in September 2023. The time where we can no longer say that we know nothing about biodiversity, is approaching.

To know about the relationship between nature and business gives many hints for business management. Understanding the relationship between nature and business, including the previously unknown business dependence on nature and business vulnerability, and changes in the competitive environment brought about by changes in the macro environment, including nature, clarifies the direction of future management. If many companies recognize the importance of nature and take measures, this will lead to healthy development of society and the economy as a whole.

However, many companies are unfamiliar with nature and biodiversity. Our desire to break out of this situation and accelerate biodiversity actions was in agreement with Kao Corporation, and this time, we have conducted a joint survey.

In this joint survey, we followed the risk and opportunity analysis framework advocated by TNFD to reveal the relationship between Kao business and nature, as well as the associated risks and opportunities. As the word suggests, the components of biodiversity are "diverse," but by grasping the interactions between nature and business and depicting changes in the business environment, we have brought business risks down to a manageable level.

We hope that the approach to achieving compatibility between biodiversity and business proposed in this report will be useful to all stakeholders in society, including companies, and will lead you to take on new challenges. We are looking forward to working with you to take on challenges and discuss them.

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Kao and Accenture Joint Survey Introduction

Objectives Of the report

- By conducting case study on biodiversity-related business risks/opportunity assessment and sharing the information obtained in that process, this report was designed and issued in order to promote biodiversity protection, restoration and regeneration efforts in the industrial world
- To that end, this report focuses on presumed difficult aspects when companies assess these risks and opportunities, and provides case study and suggestions for conducting assessments, based on Kao business

Overview of Anaylsis

- Following the risk and opportunity study framework "LEAP" (**beta v0.3 guidance**[1] issued November 2022), proposed by the Taskforce on Nature-related Financial Disclosure, Accenture and Kao conducted business risk/opportunity case study regarding Kao businesses. The data used in the assessment was based on primary information held by Kao, and primary information that was difficult to specify was supplemented with public and analogical information
- Please refer to Kao Corporation Website* and "Kao Sustainability Report 2022"[2] for information on the company's biodiversity-related measures and strategies

*Kao | About the Kao Group

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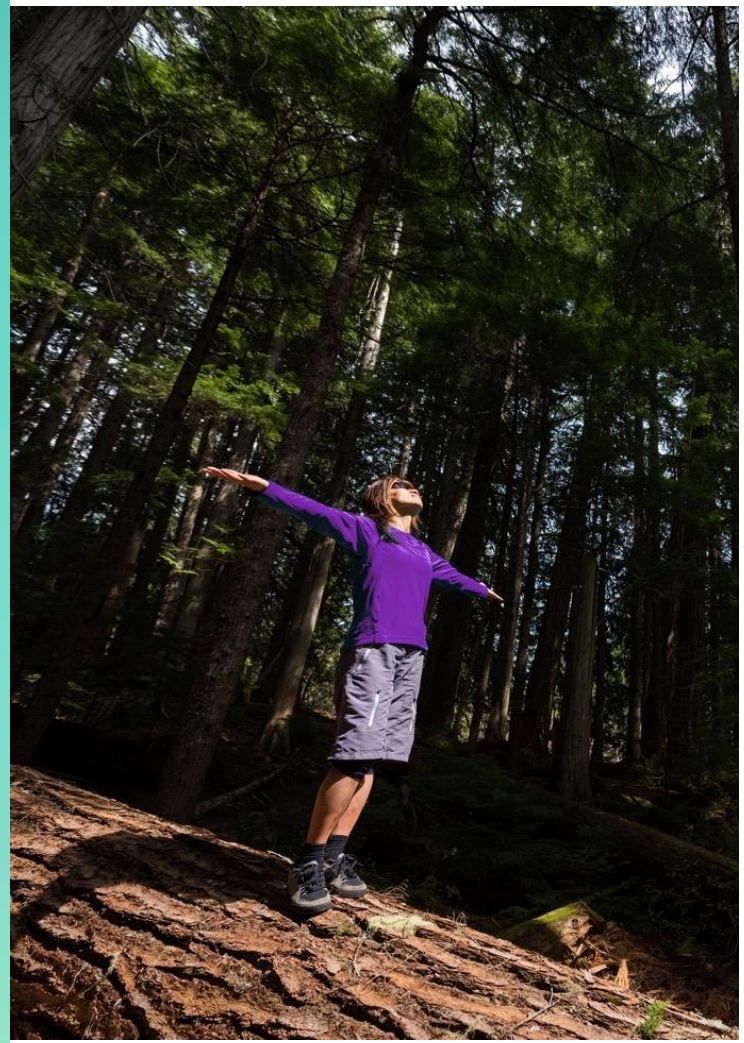

Introduction	**Executive summary**	• Executive Summary
Chapter 1	**Impact of Nature degradation on Kao business**	• The state of nature degradation • Potential impacts of nature degraded areas
Chapter 2	**Changes in the Kao's business environment that may affect nature risks**	• Future scenarios of macro environmental change • Changes in the business environment affected in each scenario
Chapter 3	**Priority risks and mitigation measures for each scenario**	• Prority risks of each scenario • Risk mitigation measures
Chapter 4	**Business opportunities**	• Overview of new business domains
Conclusion	**Outlook for the future**	• Actions to make for Biodiversity protection
Appendix	**Reference Information**	• Key Term Lists by TNFD • References

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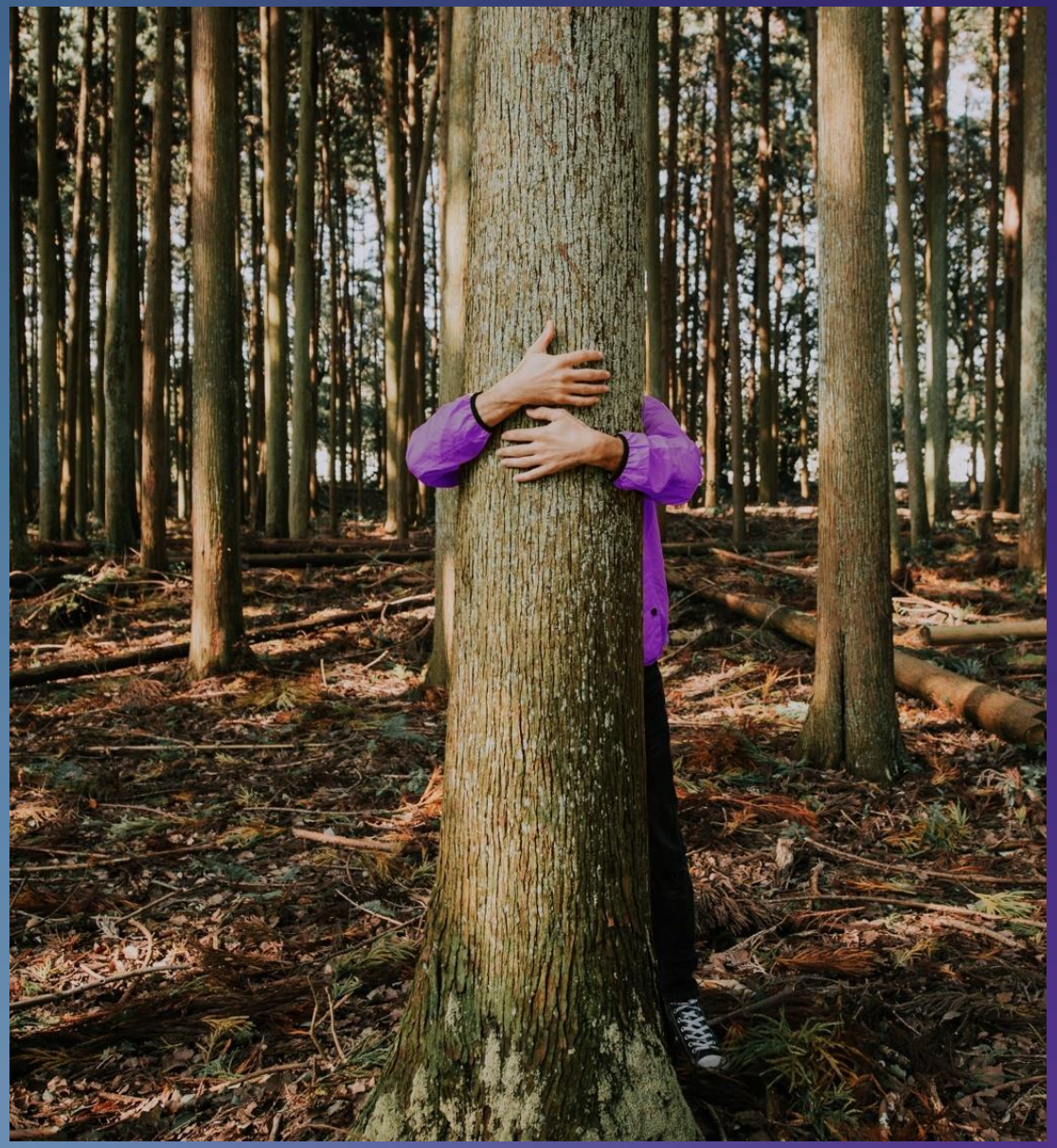
Introduction



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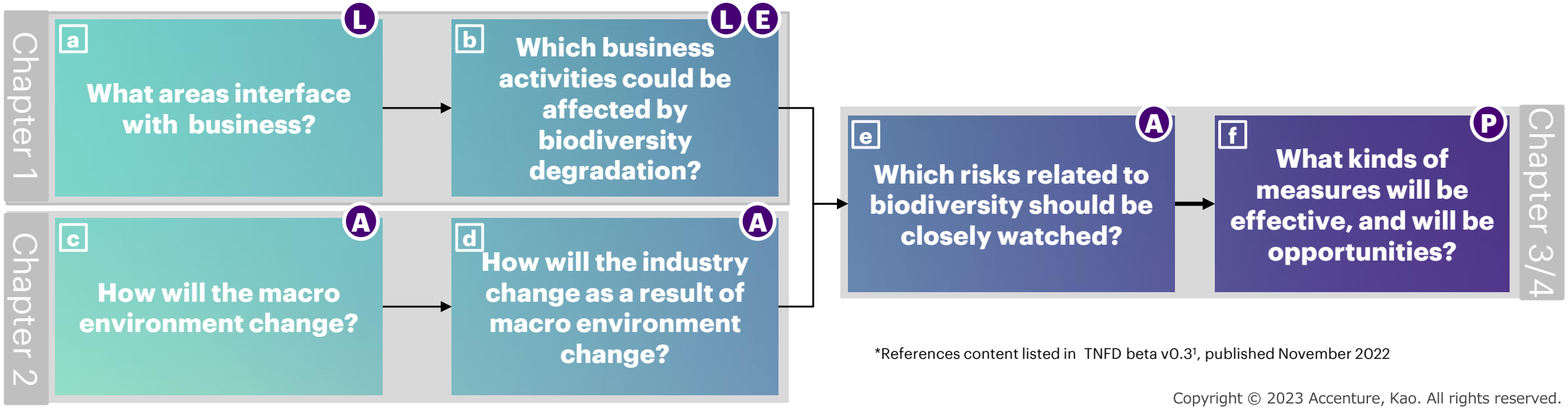
Key issues of case study

Kao and Acenture have conducted a case study on Kao business based on "LEAP*" framework (risk and opportunity analysis framework) proposed by TNFD

- In Chapter 1, we examined the relationship between the biodiversity crisis and business. We found out where upstream and downstream supply chain activities are located in the world (a. Locate), and assessed whether nature is tending toward degradation in those areas (b. Locate/Evaluate)
- In Chapter 2, we examined future changes that may affect biodiversity related risks. We set scenarios and analyzed how the macro environment including societal and economical aspect could change (c), and how this would bring changes to Kao business(d)
- In Chapter 3, we examined how to prepare for biodiversity related risks. We assessed the types of risks that may arise based on the business environment of each scenario (e), and which measures should be reinforced to reduce these risks (f) (c~f. Assess/Prepare)
- In Chapter 4, we examined business areas which could be business opportunities. We assessed the business areas which may contribute to both nature and the company.(f) (Prepare)



*References content listed in TNFD beta v0.3[1], published November 2022

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Executive Summary

Biodiversity degradation greatly undermines business continuity. Kao and Accenture have evaluated the state of nature affecting Kao's business, and analyzed future business risks and opportunities that may emerge.The analysis was conducted following the LEAP (Locate/Evaluate/Assess/Prepare) framework proposed by TNFD, and we are disclosing the survey results with the purpose of accelerating biodiversity initiatives in the industrial world.

In the "Locate" step, we divided a map of the entire world into units of 0.5° longitude by 0.5° latitude and mapped the places where Kao's business activities are practiced in each component of the supply chain (raw material production, manufacturing, consumption). We then analyzed the overview of biodiversity in three different percpsecives (biodiversity importance, ecosystem integrity, and water stress), and found areas that should be analyzed in detail later.

The result was, of the all areas in which Kao may be involved, 28% were higher in priority where the company's risks should be further reviewed.

In the "Evaluate" step, we analyzed areas detected in the Locate step, and found where nature are degrading. Then we estimated the potential impact on business in the case of nature degradation on those areas, based on the level of dependency (based on procurement volume, manufacturing volume, etc.), and identified the processes/areas where biodiveristy degradation could lead to large business impact.

The results reveald that, forest coverage(which provides protections* against natural disasater) and effect on terrestrial ecosystem in raw material production, water and soil pollution in manufacturing and consumption, and GHG emission in all proccesses of supply chain are deviating largerly from the safe zones** established in prior research and could lead to larger business impacts.

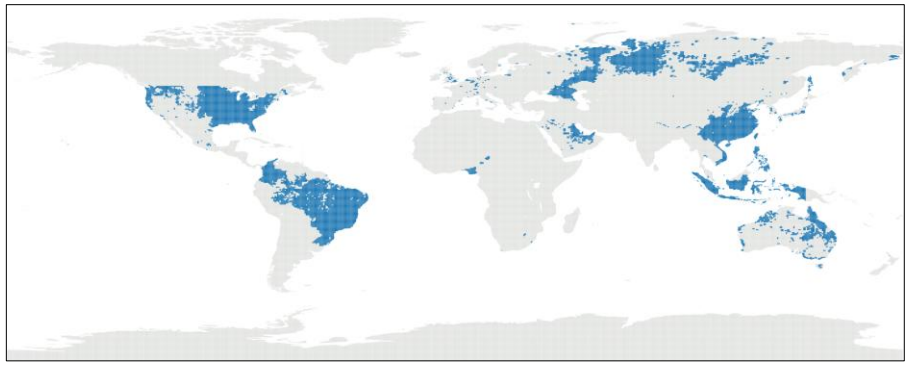

Figure 1: Potential areas of Kao business involvement worldwide

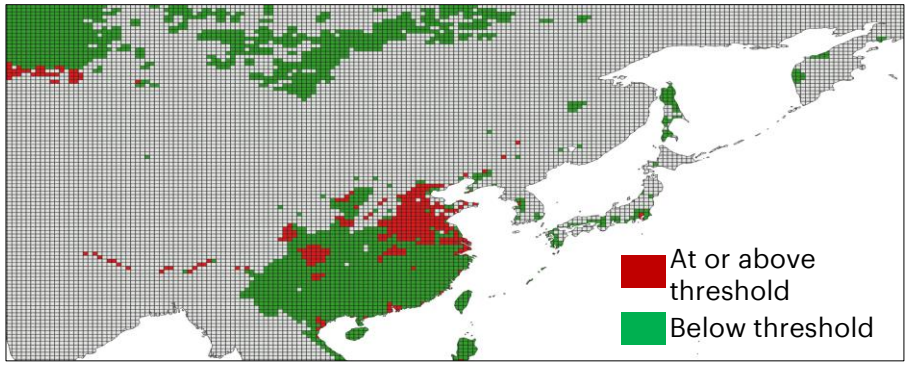

Figure 2: Assessment results for degree of nature degradation

*An ecosystem service provided by nature. Forests provide the function of protection against wind and rain
**"Planetary Boundary" indicators that establish permissible levels for the sustainability of the planet

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Executive Summary

In "Assess" step, we prepared different types of future macro environmental scenarios and specified important changes which affect relationship between biodiversity and Kao's business. 3 scenarios which differ from each other in terms of the state of macro environment and consumer segment(Mass and Small Mass) were prepared.

Base scenario

TNFD scenario[3]

High — Interconnection between nature conservation and economics/politics — Low

TNFD#1
Ahead of the Game
- Measures for both local nature and climate
- Rise of strong regulations and highly environmentally-aware consumers

TNFD#2
Go Fast or Go Home
- Expanding green regulations and investment in proportion to nature degradation
- Companies are responsible for restoring nature

TNFD#4
Back of the List
- Society prioritizes climate over local nature
- The developing countries, the more local nature degradation

TNFD#3
Sand in the Gears
- Environment and economy in opposition, nature is degraded
- Lack in effective regulation and company measures

Low ← Degree of nature degradation → High

SSP scenario[4]

SSP1 Taking the Green Road
- Economy and environment are compatible with regulations, consumer awareness and technological progress

SSP2 Middle of the Road
- Moderate nature conservation actions
- Average economic growth

SSP3 Regional rivalry-Rocky Road
- Prioritize economy with protective trade
- Degradation of both environment and economy

SSP4 Inequality – A Road Divided
- Developed countries proceeds nature conservation with high technology
- Environment and economic degradats in developing countries

SSP5 Fossil-fueled Development – Taking the Highway
- Growth with heavy use of fossil fuels
- Improvement of local environments with technological innovation

Customer segment

Mass
- Customer segment with common values and needs
- Applied to product groups where common values are important, such as family used detergents

Small Mass
- Customer segment subdivided according to consumer lifestyle and preferences
- Applied to product groups in which reflecting individual values is more important, such as cosmetics

Figure 3: Future scenarios and customer segments defined by TNFD or SSP, which were used to identify future scenarios

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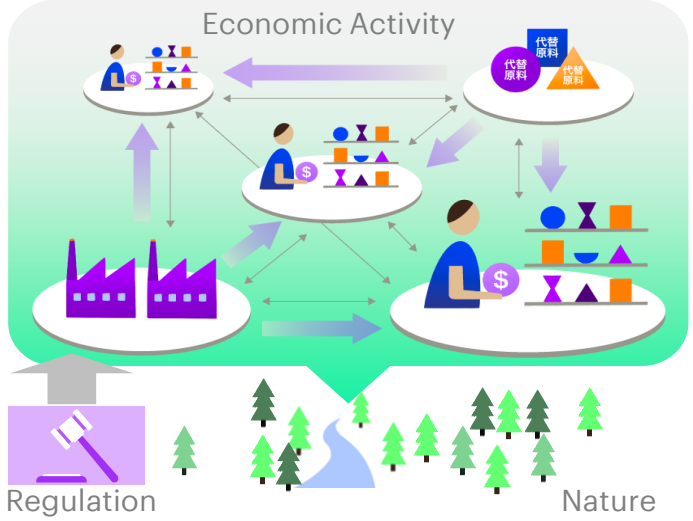
Executive Summary

The results found that the relationship between business and nature would differ by scenario, and that differences may lead to diversified products (origins of dependence and impact) and different degree of concentration or dispersion in the supply chain.

Scenario (I)-A

[Society] TNFD#1/SSP1
Nature/climate protection and economic growth both realized by strong regulation and technological innovation
[Customers]
Mass who are environmentaly conscious

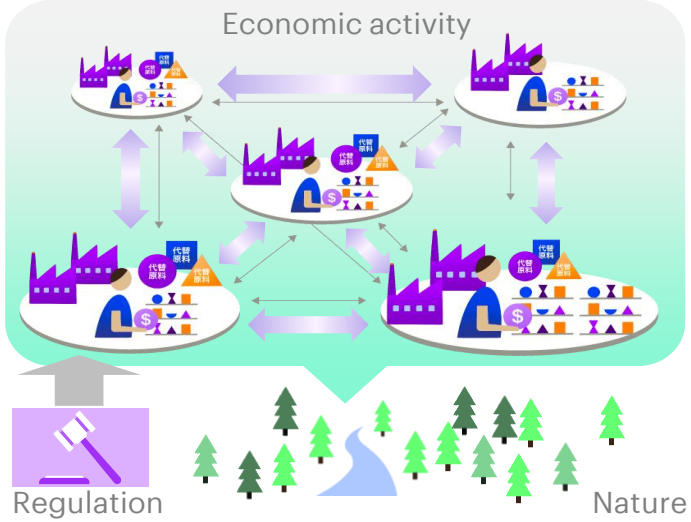
As limited high quality /environment-friendly products take over the market, supply chain become concentrated



Scenario (I)-B

[Society] TNFD#1/SSP1
Same as (I)-A
[Customers]
Small Mass, part of which choose nature conservation as a life value

As localy produced products are popular with short Lead Time, supply chain become decentralized



Scenario (II)

[Society] TNFD#3/SSP3
Markets divided due to protective trade
Mutual collapse of economy and environment
[Customers]
Mass with mass consumption

As protective trade and natural disasters interfere, supply chain is heavily hampered

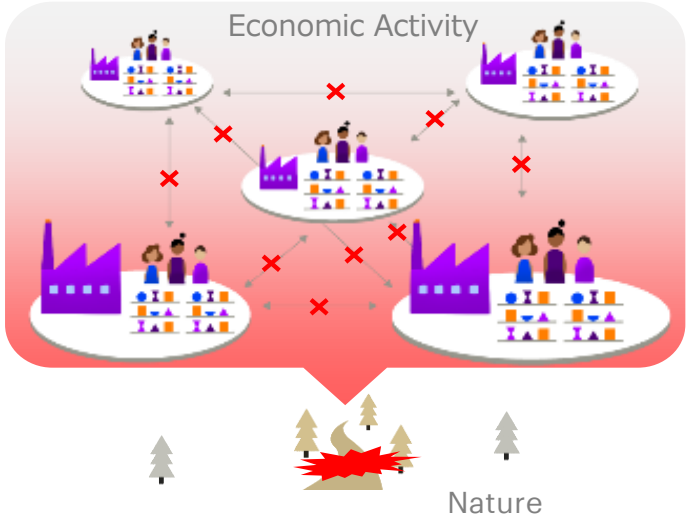


Figure 4: Three types of future scenarios surrounding biodiversity. The business environment may change depending on customer segments in addition to nature conservation or degradation trends

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Executive Summary

For each biodiversity-related risk defined by TNFD, we assessed the (i)probability of occurrence based on the direction of macro environment changes, and (ii)scale of impact of each risks based on the state of nature degradation and dependence on nature, both of which were found in the Evaluate section, in order to identify higher priority risks in each scneario.

The results confirmed that for Scenario(I), stricter regulations for nature conservation and stakeholder negotiation risks such as brand damage and animosity from NGOs are important, and for Scenario(II), procurement of raw materials are exposed to risks including decreased protective functions, rising costs and destabilization, are high priority.

: Priority risks* in each scenario

*Impact above "Medium"
Probability above "High"

			Scenario (I)-A		Scenario (I)-B		Scenario (II)	
			Impact	Probability	Impact	Probability	Impact	Probability
Physical		Changes to the **supply of natural inputs**	Small	Medium	Small	Medium	Small	Very High
Physical		Changes to **protection from natural hazards**	Large	Low	Large	Low	Large	High
Transition	Policy/ Legal	Strict **legislatrion/ regulation**	Large	High	Large	High	Large	Low
Transition	Policy/ Legal	More stringent **reporting obligation**	Medium	Very High	Medium	Very High	Medium	Low
Transition	Market	**Volatility/change to costs** of materials	Large	High	Large	High	Large	Very High
Transition	Market	Conflict with **stakeholders**	Small	Very High	Small	Very High	Small	Medium
Transition	Market	Changing **investor preferences**	Small	Very High	Small	Very High	Small	Low
Transition	Market	Changing **consumer preferences**	Medium	Very High	Medium	Very High	Medium	Low
Transition	Reputation	Decline in **brand proposition**	Medium	Very High	Medium	Very High	Medium	Low
Transition	Technology	Pressure to introduce **new technology**	Small	Very High	Small	Very High	Small	Low

1 Priority Risks* shared across multiple scenarios

2 Priority Risks* with high impact and probability of occurrence in each scenario

Figure 5: High priority risks and their types in each scenario

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Executive Summary

In “Prepare” step, how companies should approach biodiversity related risks, which varies greatly due to state of external environment, was considered.

First, given the recent unstable political and economic situation and the increasing trend of disasters, focusing only on the likely scenarios and risks will lead to major losses. By identifying the priority risks for each scenario, companies will be able to take risk mitigation measures immediately, when they face with changes in business environment. It is essential to prioritize, risks with higher impact or risks which are common between several scenarios.

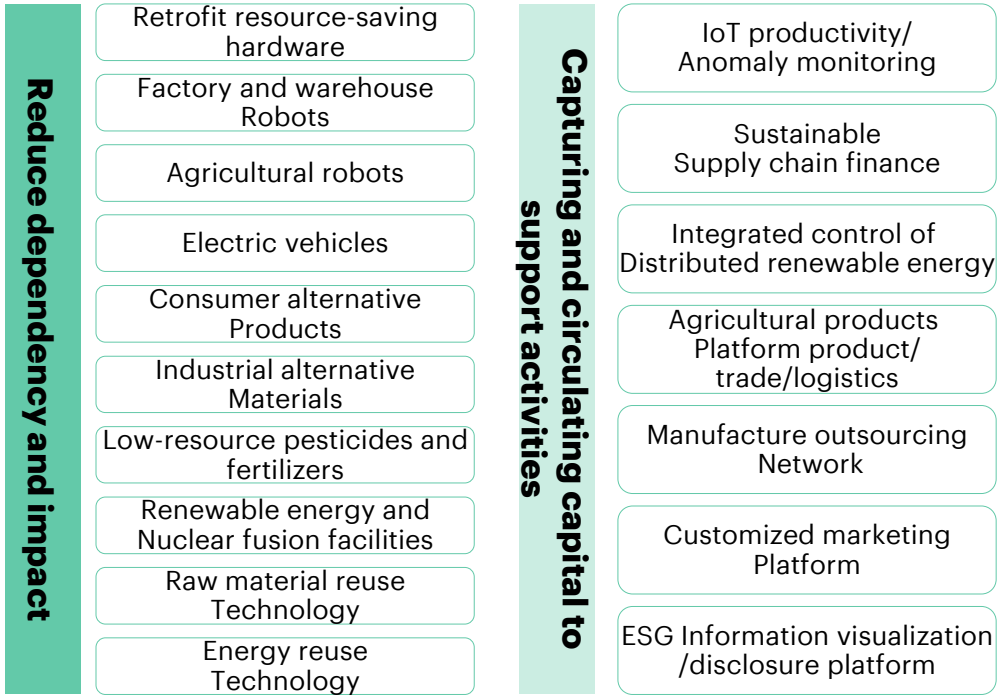
Risk mitigation measures can be organized into two categories: actions to reduce the dependency or impact towards nature (Avoid, Efficiency, Reuse, and Regenerate), or efforts to acquire and circulate capital (Human resources, Finance, Information, and Network) to support such action. When considering effective measures these categories will be supportive for listing possible measures thoroughly.

Opportunities, on the other hand, are defined in the TNFD as “Activities that have a positive impact or reduce a negative impact on nature and are beneficial to the company and nature.” Which means cooporates are expected to step in further than just taking care of its own risk management, and to make broader effects.

In this study, “opportunities” are defined as those that improve existing operations and those bring greater environmental impact and risk reduction and generate new revenue by rennovating operations.

Based on this definition, we examined new business opportunities which may emerge in near to medium term. As a result, identified 17 possible areas.

Figure 6: 17 business areas* that can contribute to reducing the impact on nature



*Above area has no relation to Kao’s strategy or future action

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Executive Summary

The study reveals that, given the biodiversity degradation that has already occurred, whether the international community follows the future where “active efforts are made to conserve, recover and restore" or "effective measures cannot be made in order to prevent degradation" will lead to significant impact on business activities.

It is not easy to fully prepare for these impacts, but to understand the contact point with nature and to evaluate how your business is dependent or has impact towards nature would be the very first step to take. And we believe it would lead to futher significant steps to reduce society’s impact on nature and generate opporutinies for business.

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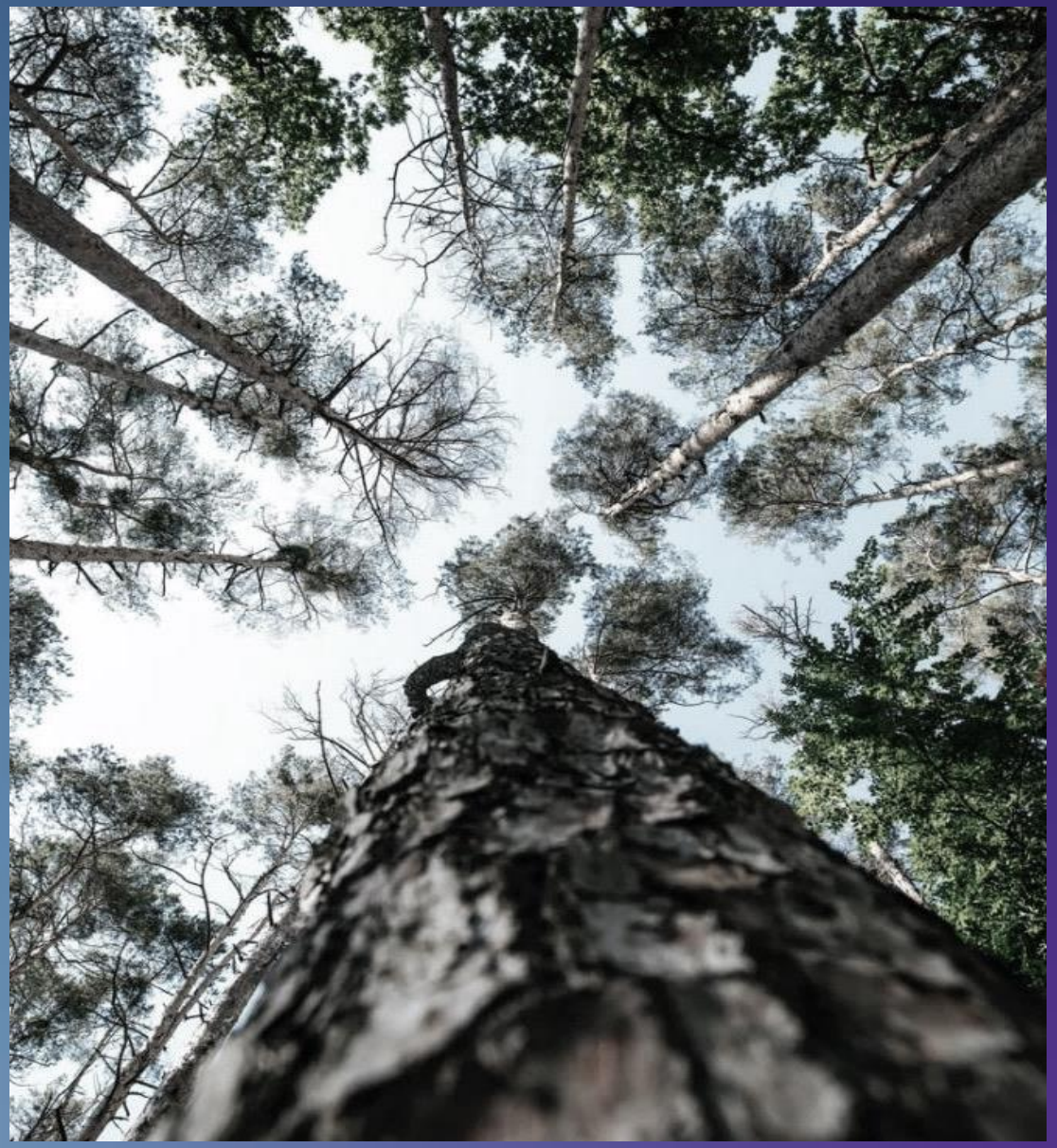
Chapter 1

Nature degradation and its impact on Kao business



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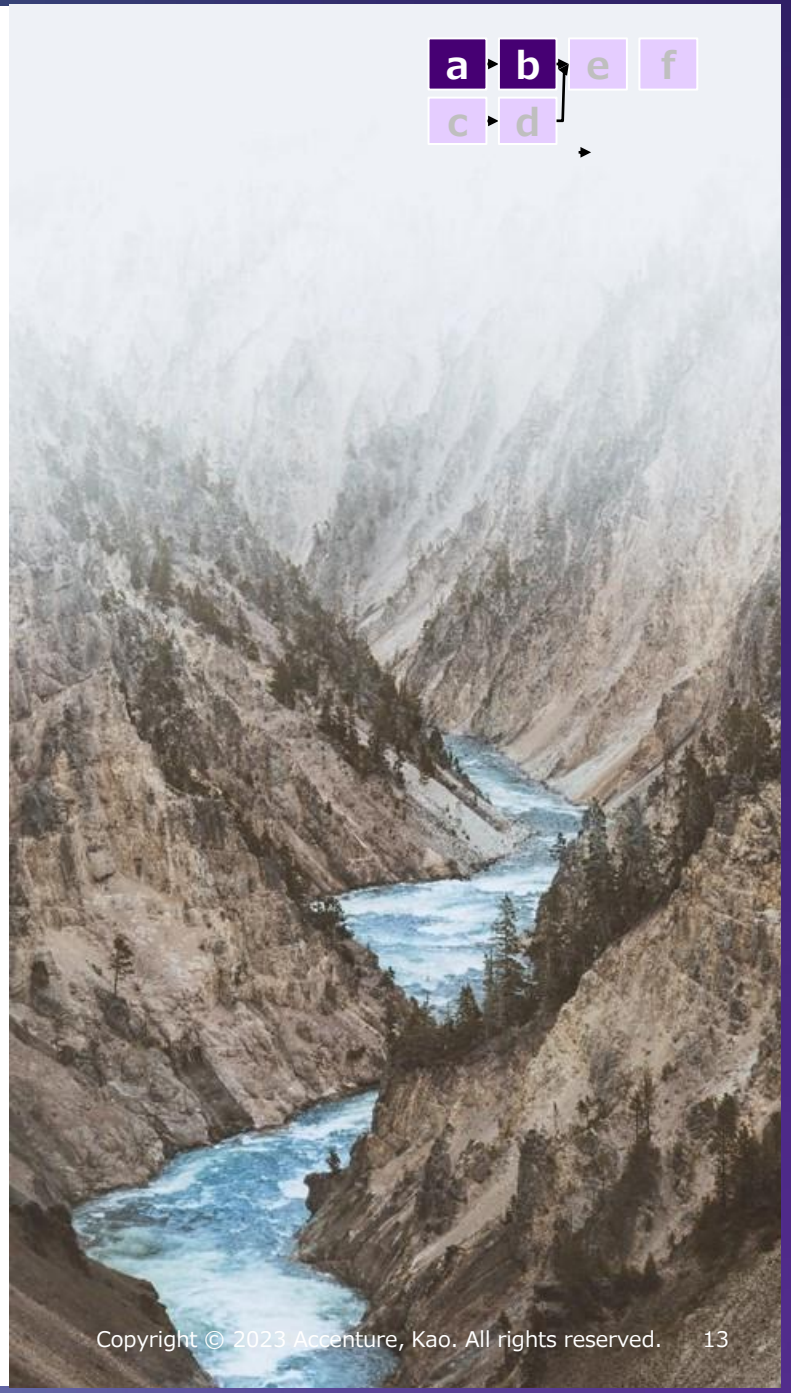
Chapter 1
Nature degradation and its impact on Kao business [Conclusion]

Biodiversity and business are closely related, with 52% of total global GDP depending on it. Kao also depends on and impacts nature extensively, including forests, water and the atmosphere, from upstream to downstream of its supply-chain, and may be exposed to business risks as a result of nature degradation.

- Business is established on the use of various materials and services that are provided by biodiversity. However, biodiversity as the source of these servies is being degraded significantly, and there are concerns that this will have a serious impact on business in near future.
- Kao (manufaturer of daily necessity and chemical products) is no exception. From raw material production to consumption, its supply chain spans all parts of the globe, potentially interfacing with 15% of the planet (on basis of analysis units). Furthermore, in all these areas it is closely related to various parts of nature, such as water, forests, soil and the atmosphere. Using TNFD criteria, 28% of the areas were especially important to biodiversity and should be prioritized for detailed assessment
- Of these, we found that adequate consideration will be needed to avoid deviating from the safe zones established in prior research: declining forest coverage (i.e. reduced protective functions) and impact on terrestrial ecosystems in raw material production, polluted water and soil in production and consumption, and GHG emissions throughout all processes.



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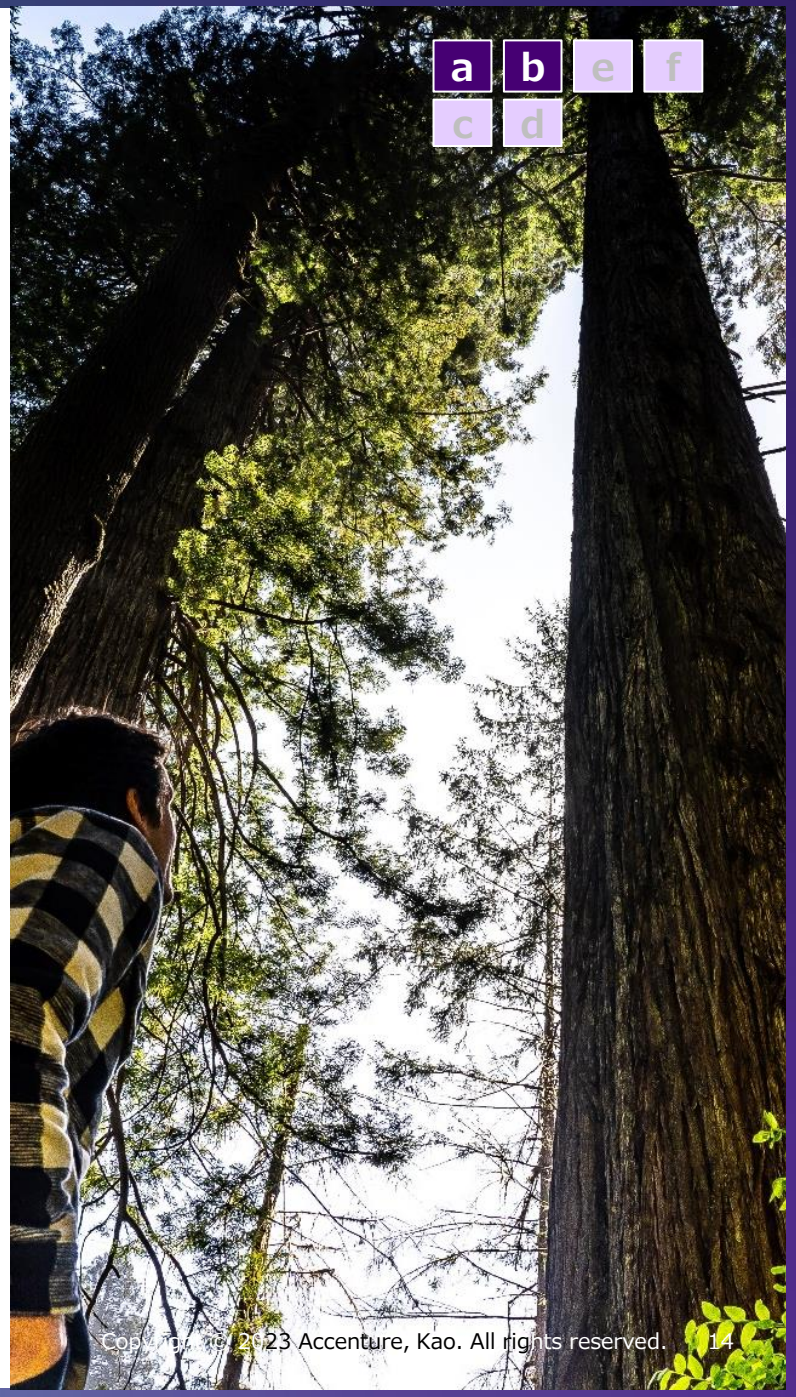
Chapter 1
Nature degradation and its impact on Kao business [Approach]

In this step, we identify business processes that have a large potential business impact from nature degradation. In this case study, we identified the processes with large business risks by (a) identifying areas where Kao business interface with, and (b) estimating potential business impact due to nature degradation based on business dependence in areas with particularly severe nature degradation.

- (a): To reflect differences in the state of nature in individual regions, we divided the world map into units of 0.5° longitude by 0.5° latitude, and mapped where business activities are performed at each stage of the supply chain: raw material production regions, Kao and supplier factories, and key consumption areas.
- (b): We evaluated and identified priority assessment areas from part (a), using the three perspectives defined by TNFD: (1) Integrity (rate of species loss 20% or greater); (2) importance (50% or more of the area is a nature reserve, or 0.4 or more endangered species per 10km2 inhabit the area); and (3) water risk (overall Aqueduct evaluation of 4 points or more). Then, we evaluated whether the state of nature of each region fell within the safety zone indicated by previous research. Finally, we calculated the business impact in the event of nature degradation based on the degree of dependence on the crisis area, and identified the business processes that would receive the larger impact.
- Evaluation by units of 0.5° latitude by 0.5° longitude (25km-50km) allowed us to achieve both local and global analysis which can account for locally diversified nature as well as Kao's globally established supplychain.

In the ensuing steps, we prepare multiple future scenarios for the industry and specify business risks that could affect operations where degradation of nature is expected.



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case study

Locating business footprint

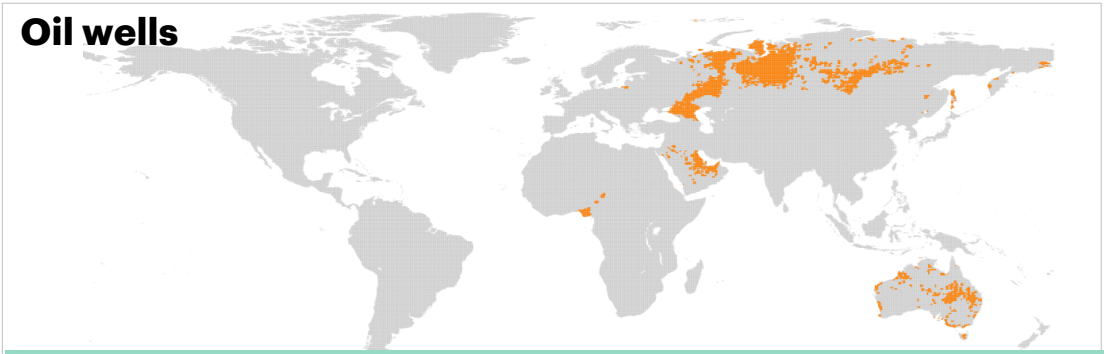
We divided the planet into segments(cells) of 0.5° latitude/longitude, and identified areas where Kao business interface with. With 96,000 cells worldwide, there may be participation in 15,000 of them.

Areas where Kao business interface with (sample)

Pulp timber forests

1,011 cells, 1 country / region

Oil wells



3,703 cells, 7 countries / regions

Supplier factories

53 cells, 7 countries / regions

Kao factories

27 cells, 11 countries / regions

Information used for regional analogical inference: [Pulp timber forests, oil wells, supplier factories] Inferred using public data(i.e.,national import and export statistics) in combination with data provided by Kao ; [Kao factories] Provided by Kao

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case study

Biodiversity degraded areas

Integrity was assessed from the perspective of "degree of species loss," importance from "endangered species and nature reserves," and water stress from "water risk." Risk trends vary by region.

Global nature degradation (sample)

Nature degradation in areas where Kao business interface with

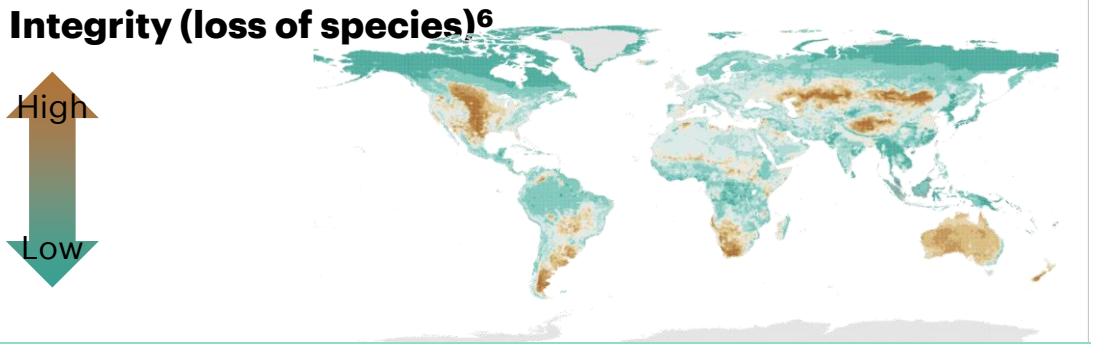
Water stress[5]

Biggest risk in South Asia and Africa, with weak infrastructure

Pulp timber forests

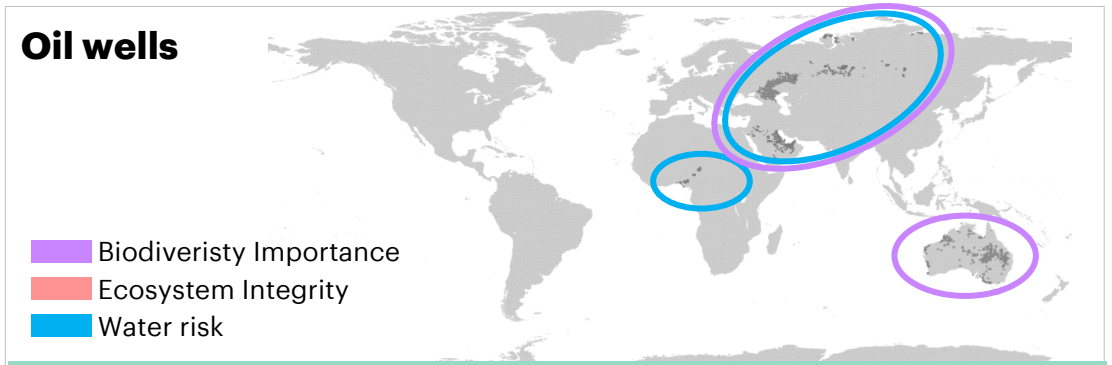
High water risk in certain parts of North America

Integrity (loss of species)[6]



Loss in North American agricultural zones and deserts of Asia and Australia

Oil wells



Importance and water risk are high from Middle East to Russia

Reference information for regional analogical inference: [Pulp timber forests, oil wells] Inferred using public data(i.e.,national import and export statistics) in combination with data provided by Kao

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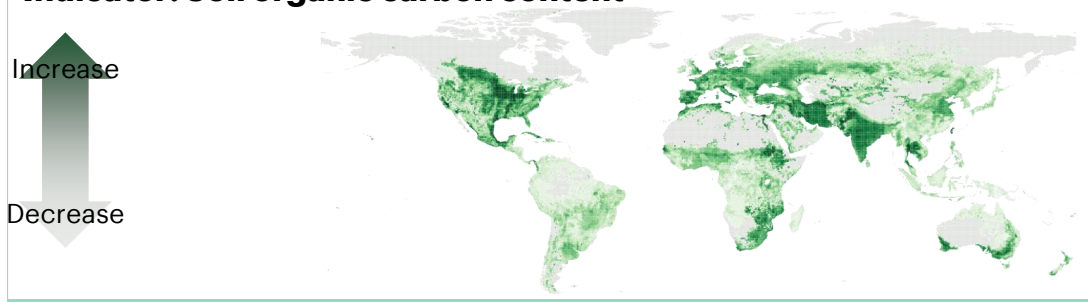
case study

Priority nature for Kao business

We narrowed down the natural capital with high dependence and impact for the industry and assessed the area where Kao business interface with. As a result, we have recognized the difference in state of degradation by area.

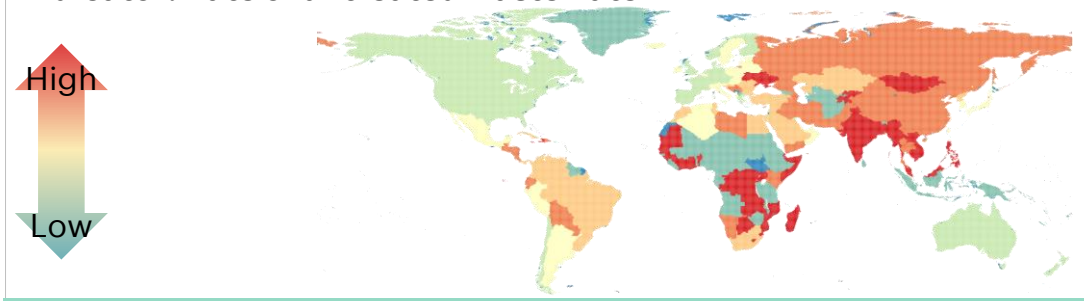
State of global nature capital

Indicator: Soil organic carbon content[7]



Limited risk in desert area and high laltitude areas

Indicator: Rate of untreated wastewater[5]



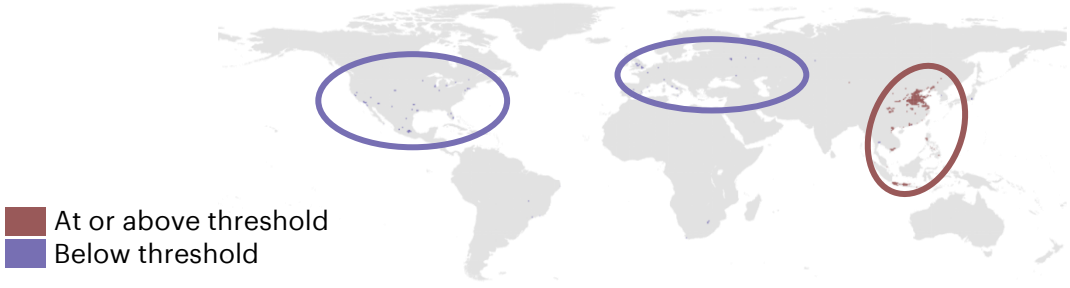
Higher untreated rate in countries with low GDP

Risk in the area where Kao business interface with

Indicator: Soil organic carbon content

Particularly high risk trend in Australia

Indicator: Rate of untreated wastewater



Particularly high risk trends in China

Reference information for regional analogical inference: [Soil organic carbon] Inferred using public data(i.e.,national import and export statistics) in combination with data provided by Kao

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case study

Priority nature capital to Kao business

We assessed the scale of potential business impact caused by operating in areas with trends of nature degradation. As a result, we found that we should pay attention to avoid following impacts to deviate from the safe zones* established in prior research: declining forest coverage (i.e. reduced protective functions) and impact on terrestrial ecosystems in raw material production, polluted water and soil in production/consumption, and GHG emissions throughout all processes.

: Large
: Medium
: Small
: Priority Nature (Degradation and Business impact is both above "Medium")

		Dependence				Impact							
		Forests		Water		Forests		Water		GHG		Pollution	
		• Low protection and less lumber by deforestation		• Less water • Poor water quality		• Terrestrial ecosystems loss by deforestration		• Less water • Water ecosystem loss by water loss/deterioration		• Accelerated climate crisis due to GHG emissions		• Pollution of air, water, soil and waste by pollutants	
		Degraded Level	Related Revenue Scale	Degraded Level	Related Revenue Scale	Degraded Level	Related Revenue Scale	Degraded Level	Related Revenue Scale	Degraded Level	Related Revenue Scale	Degraded Level	Related Revenue Scale
Raw material production	Oil wells	L	L	-		S	L	-		L	L	L	L
	Pulp forests	L	S	-		L	S	-		L	S	S	S
	Coconut	M	M	M	M	M	M	S	M	-		S	M
	Soybeans	Commodities whose risk should be assessed regardless of business impact											
	Sugar cane												
	Coffee												
Manufacturing	Supplier Factory (pulp)	-		S	S	-		S	S	L	S	S	S
	Supplier Factory (oil)	-		M	L	-		M	L	L	L	L	L
	Kao Factory	-		L	L	-		L	L	M	L	L	L
Consumption	Consumer	-		-		M	L	L	L	L	L	L	L

*: The range of impact amount termed as Low-risk by "Planetary Boundary". "Planetary Boundary" presents a set of nine boundaries within which humanity can continue to develop and thrive for generations to come.

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Key points of Analysis #1 Assess wide range efficiently

To assess Kao businesses, which have global supply chains, we divided the state of nature in each region into units of 0.5° latitude by 0.5° longitude (25-50km). By doing this, we achieved both consistent granularity and an efficient analysis.

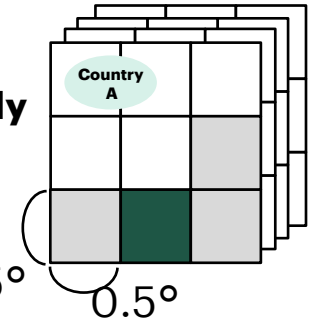
Features of this study

Assess the state of nature in business activity locations and their surroundings, in units of 0.5° latitude by 0.5° longitude

Option 1 Used in this case study

Segment the entire globe evenly and assess in parallel

Use existing data to allow for assessment in a fixed period



Option 2

Local nature assessed area by area

Requirs to collect detail data on nature conditions, economic and social trends at all sites

Useful when business operation area is limited

■:High risk ■: Low risk

Advantages of these features

Achieve an efficient assessment of companies with wide-ranging and diverse points of contact with nature

Type #1

STEP 1 Option 1

High Level

Assess the entire globe with the same unit, and **identify particularly high-risk areas**

STEP 2 Option 2

Detail

Conduct additional analysis on areas that requires further understanding

Shorten the time for assesment

Type #2

STEP 1 Option 2

Comprehensive detailed assessment of all nature which company encounter

Now

1. Evaluate degree of dependencies/impacts for the company
2. Assess degree of degradation of surrounding nature

×

Future

1. Its own business plan
2. Regional development plan
3. Regulation considerations

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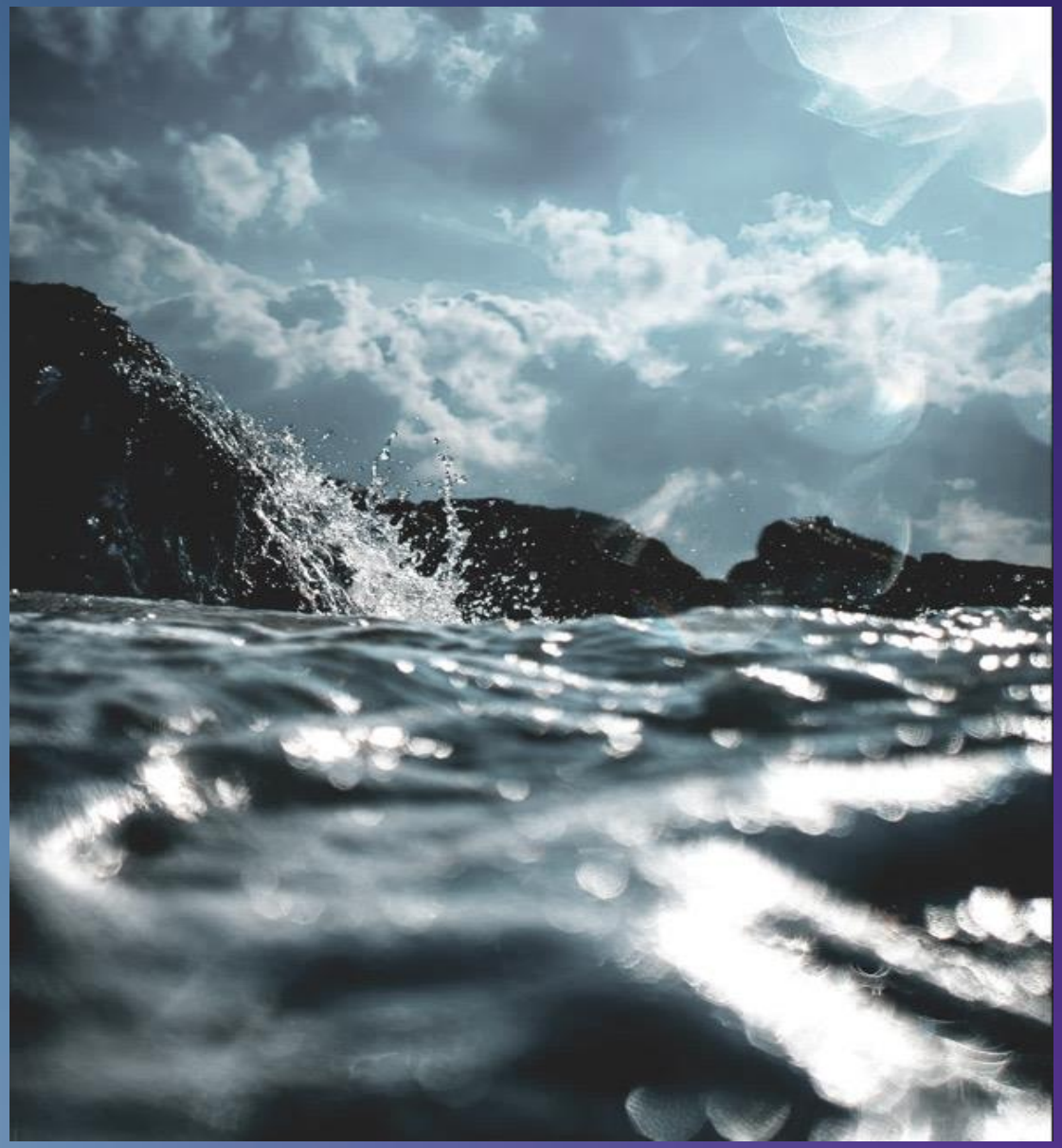
Chapter 2

Changes in Kao's business environment that may affect nature risks



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Chapter 2
Changes in Kao's business environment that may affect nature risks [Conclusion]

Breadth and uncertainty of risks are making biodiveristy actions difficult. Since risks to monitor drastically differs depending on state of macro environment, it is essential to catch changes in macro environment and link them to emerging risks.

- Wide range of business risks caused by nature degradation could emerge, because the state of nature is affected by numerous macro environmental factors including economic development, regulations, and technological progress, and type of nature which is essential to business differs by type of business operation
- Therefore, rather than forcibly narrowing down risks, it is important to depict multiple mid-term macro environment scenarios, specify possible risks by linking them to the state of macro environment in each scenario
- In this case study, we formulated three scenarios using variables of macro environment (relationship between nature and politics, economics and society,) and customer segments (Mass and Small Mass). The results showed that the relationship between business and nature changes in each scenario, and that differences may lead to diversified products (origins of dependence and impact), and in the degree of concentration or dispersion in the supply chain

*This chapter will only list the scenarios, and the business risks linked to each scenario will be listed in Chapter 3

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a b e f
c d

Chapter 2
Changes in Kao's business environment that may affect nature risks [Approach]

In this step, we formulated scenarios of future business environment changes. (c) We drafted multiple patterns of future macro environmental scenarios for nature, economics and society. Followingly (d) specified important changes expected in Kao's business.

- (c): Based on two oppposite scenarios among total four scenarios presented by TNFD, we had ellaborated the detail by adding information from SSP scenarios which predict changes in the macro environment, and segmenting by customer types.
- (d): The ellaborated 3 scenarios were further linked to business changes. Specifically, we conducted the analysis based on four perspectives: "products" and "business scale" that define the total dependence and impact; "degree of concentration" that defines the distribution of supply chain related area; and "probability of risk", which is the probability of risk occurrence
- The approach of creating scenarios using a wide range of variables, including those other than nature, resulted in allowing us to secure scenario-variety in a multifaceted way, which is important in scenario analysis

Using the macro environment and industry change scenarios specified in this analysis, in subsequent chapters we will identify the risks that should be monitored for each scenario and the nature conservation efforts that should be reinforced to deal with them.

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Biodiversity related risks and actions to take

The difficulty with biodiversity lies in the fact that the points of contact with nature and its condition is diverse and subject to external changes, and fluctuate widely. It is essential to verify risks in consideration of medium-changes in the business environment, without taking the current business environment for granted.

Characteristics of biodiversity-related risks	Action
Wide-ranging Risk type The types and conditions of nature involved are diverse both in regions and processes. Therefore, the risks are diversified + **Risk occurrence fluctuates widely** Risks that occur will change depending on the external environment (political, economical)	**Illustrate multiple industry change patterns, and prepare for risks which may occur in each pattern**

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: Scenario used in the case study (Same color indicates correspondence)

Foresee the macro environmental changes [Approach]

To foresee industry change patterns, we combined TNFD Scenarios #1 and #3 with SSP 1 and 3, which have the same preconditions. We further subdivided them into Mass and Small Mass customer segments.

Macro Environment × Customer segment

TNFD scenario[3]

Interconnection between nature conservation and economics/politics (High – Low)

Degree of nature degradation (Low – High)

TNFD#1 Ahead of the Game
- Take measures for both nature/climate
- Rise of strong regulations and highly environmentally-aware consumers

TNFD#2 Overcoming crisis
- Expand regulations and investment to face nature loss
- Companies are responsible for restoring nature

TNFD#4 Back of the List
- Society prioritizes climate over nature
- The developing countries, face more nature degradation

TNFD#3 Sand in the Gears
- Environment and economy are tradeoff and nature is lost
- Lack in effective regulation and company actions

SSP scenario[4]

SSP1 Taking the Green Road
- Economy and environment are compatible with regulations, consumer awareness and technological progress

SSP2 Middle of the Road
- Moderate nature conservation actions
- Average economic growth

SSP3 Regional rivalry-Rocky Road
- Prioritize economy with protective trade
- Degradation of both environment and economy

SSP4 Inequality – A Road Divided
- Developed countries proceeds nature conservation with high technology
- Environmental and economic degradation in developing countries

SSP5 Fossil-fueled Development – Taking the Highway
- Growth with heavy use of fossil fuels
- Improvement of local environments with technological innovation

Customer segment

Mass
- Customer segment with common values and needs
- Applied to product groups where common values are important, such as family used detergents

Small Mass
- Customer segment subdivided according to consumer lifestyle and preferences
- Applied to product groups in which reflecting individual values is more important, such as cosmetics

Combined the TNFD scenarios with SSP scenarios and analyzed industry changes by customer segment

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Foresee the macro environmental changes [Conclusion]

In Scenario (I) , we analyzed the risks of businesses for Mass and Small Mass customer, with a world that has achieved compatibility between the environment and the economy with international cooperation. In Scenario (II), we analyzed business risks in a world where the environment and economy have worsened through antagonism.

TNFD scenario

SSP scenario

	Scenario (I)-A	Scenario (I)-B	Scenario (II)
Society	Nature/climate protection and economic growth in line with strong regulation and technological innovation	Same as (I)-A	Markets divided by protective trade. Economy and environment collapse
Customer	Environmentally-aware Mass	Small Mass with nature conservation as a life value	Mass consumption

Base scenario terms

		Selected scenario	TNFD#1/SSP1	TNFD#1/SSP1	TNFD#3/SSP3
Environ-ment		Nature	**Valued** (conserved)	Same as (I)-A	**Not emphasized** (degraded)
		Climate	**Valued** (conserved)		**Not emphasized** (degraded)
Regul-ations		Strength	**Strong** conservation regulations		**Limited** conservation regulations
		Scale	Shared **globally**		**Local**
		Global Alliance	**Effective**		**Limited**
Economy		Growth	**Growth**		**Stagnation**
		Globalization	**Accelerate(local products** preferred)		**Cease**(markets are divided)
		Investor mind	**Emphasis on environment**		**No emphasis on environment**
		Disparity	**Reduction**		**Expansion**
Society		Eco Awareness	**High**		**Low**
		Consumer mind	**High quality, Low resource, Local**		Continued **mass consumption**
		Infrastructure	**High**		**Low**
Tech-nology		Evolution speed	**Fast**		**Slow**
		Transmit speed	**Fast**		**Slow**
Customer segment			**Mass**: Require environmental considerations **within the scope of improving the performance of existing products**	**Small Mass**: Some ask for environmental considerations as **added value**	**Mass + Small Mass: Mass consumption type** with overall low environmental awareness

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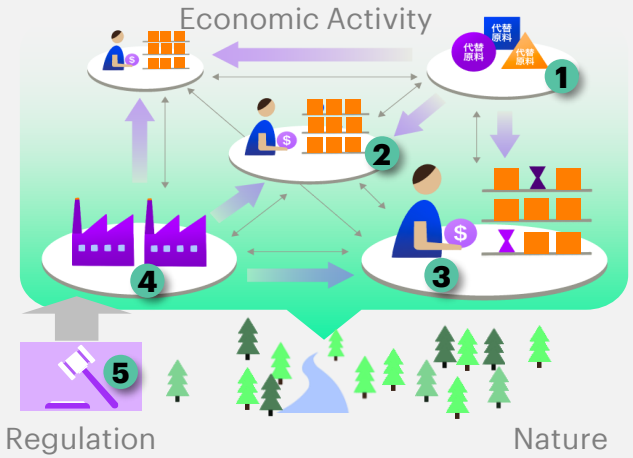
Industry changes: Summary

Based on changes in the macro environment, we have illustrated the possible changes in business environment, such as variations in products, business scale, degree of integration, and probability of risk occurrence.

Scenario (I)-A (Consumer: Mass)

As limited high quality /environment-friendly products take over the market, supply chains become concentrated



Product changes

1. Spread of **alternative raw materials**
2. **Less product types with emphasis on quality and environment**

Business scale changes

3. **Increase in average spending per customer**

Change in degree of integration

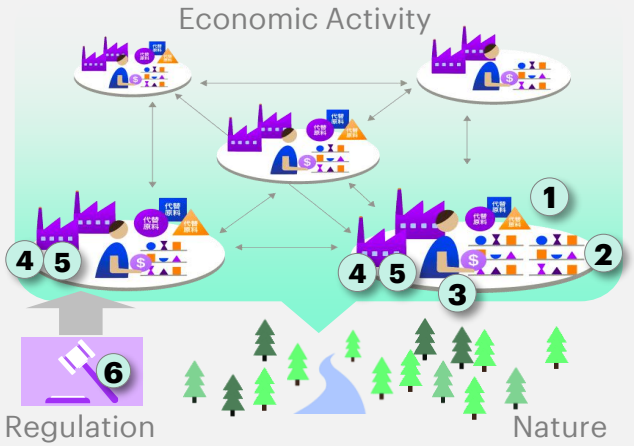
4. **Increased concentration** through open markets and international division in labor

Change in risk occurrence probability

5. Growing **transition risk**

Scenario (I)-B (Consumer: Small Mass)

As locally produced products are popular with short Lead Time, supply chains become decentralized



Product changes

1. Spread of **alternative raw materials**
2. Greater **product diversity** due to **greater diversity of needs**

Business scale changes

3. **Increase in average spending per customer**

Change in degree of integration

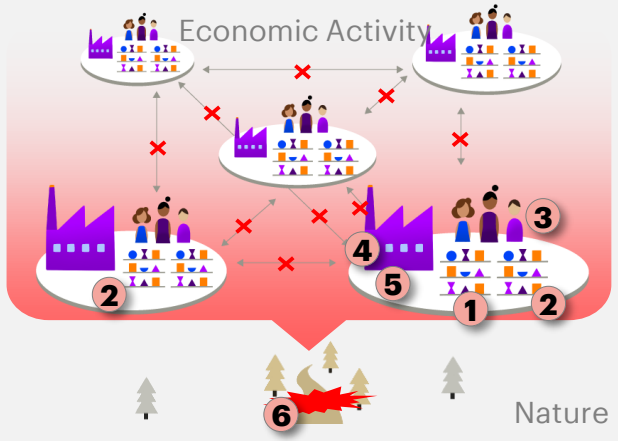
4. **Decentralization through local production and shorter Lead Time**
5. Partial **outsourcing** of factories

Change in risk occurrence probability

6. Growing **transition risk**

Scenario (II) (Consumer: Mass + Small Mass)

As protective trade and natural disasters interfere, supply chains are heavily hampered



Product changes

1. **Limited alternative materials**
2. **Increase in product types** due to divided economic **blocks**

Business scale changes

3. Expands due to **population growth**

Change in degree of integration

4. **Decentralization through protective trade**
5. **Upsizing in** each **country** with **economies of scale**

Change in risk occurrence probability

6. Growing **physical risk**

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Industry changes: Scenario (I)-A (Customer: Mass)

Transition risks are mainly surfacing. If the concentrated production of raw materials and factories encounters strict scrutiny and neglect to take environmental measures, market share could be lost all at once.

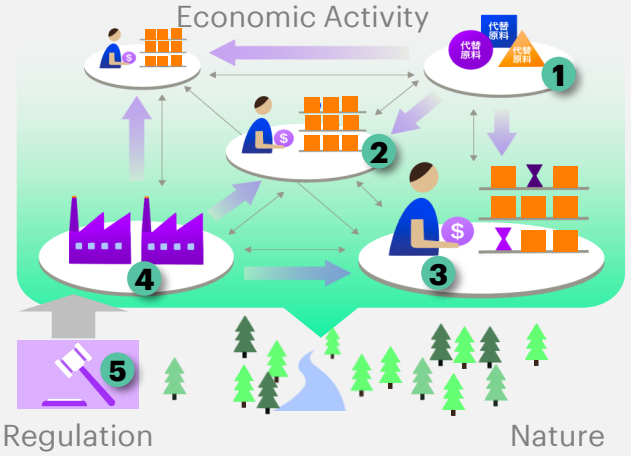
Changes in economic and social situation

Category of change	Details
Natural environment	Conservation efforts progress, and **both the climate and ecosystems recover**
Politics and regulations	**Nature conservation regulations get stricter** through public administration and international organizations (5)
Society	Mass market for low-priced and high environmental impact products is concentrated in low environmental impact products (1), and **needs** are further **homogenized** (2)
Economy	Economic development through **global cooperation** (4). Developed and developing countries both grow, and **disparities shrink** (3)
Technology	**Technological innovation progresses** in (1) alternative raw materials due to new investment

Industry changes occuring from social and economic changes in next section

Changes in consumer goods ind.

As limited high quality /environment-friendly products take over the market, supply chains become concentrated



Product changes

1. Spread of **alternative raw materials**
2. **Less product types** with emphasis on **quality and environment**

Business scale changes

3. **Increase in average spending per customer**

Change in degree of integration

4. **Increased concentration** through open markets and international division in labor

Change in risk occurrence probability

5. Growing **transition risk**

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More dependence and impact by area
Less dependence and impact by area

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Industry changes: Scenario (I)-A (details)

Strict conservation regulations come into effect as consumer needs become more refined and diverse. In the "Mass" segment, companies need to provide high value while responding to regulations in a centralized supply chain.

Macro changes

Natural environment

- N1 Lower GHG (Rising temp)
- N2 Forest restoration
- N3 Water shortage accelerated
- N4 Less waste and pollution

Politics and regulations

- P1 Environmental protection: Strict
- P2 International cooperation: Proactive
- P3 International organizations: Greater influence

Economy

- E1 Growth: Focused on developing countries
- E2 Disparity: Reduced
- E3 Globalization: Facilitated

Society

- S1 Population: Slight increase
- S2 Urbanization: Progressing
- S3 Sanitation access: High
- S4 Consumption: Quality and low resources

Technology

- T1 New development: Fast
- T2 Energy: Preference for renewables
- T3 Agriculture: Better yields

Industry changes

Oil wells → Plantations/ production forests → Material manufacturing → Final product manufacturing → Consumption

Product changes
Will product dependence and impact increase?

More options for certified/alternative materials

More demand for low-resource materials
- S4 Environmental orientation

Spread of alternative materials
- P1 Lower cost gap by regulations
- T1 Expansion of algae fats and oils, etc.

Lower number of products, with emphasis on quality and environment

Consumption with emphasis on quality and environment
- S2 S4 Sophisticated and environmentally-oriented needs
- E1 E2 Higher earnings

Scale changes
How much volume is provided?

Market expands, but due to an increase in average spending per customer

Greater inclination to pay for environmental value
- S1 Rise of environmentally-oriented consumption

Slight increase in consumers
- S1 End of population growth

Change in degree of integration
Will dependence and impact be concentrated?

Concentrated production through continuous markets and international specialization

Improved market continuity
- E3 Repeal of trade barriers
- T1 T3 Improved productivity

Accelerated international specialization
- E3 Repeal of trade barriers
- P2 Support by supplier countries
- P3 Global cooperation led by international organizations

Growth of Developing

Market growth in Developing countries
- E1 Refined consumption in developing countries

Changes in probability of risk
Will the response to dependence and impact be more severe?

More severe transition risk exposure line, including regulations and reputation

Stricter supervision
- P1 Strict regulations (forest conservation, etc.)
- P2 P3 Intervention by international organizations
- S4 Greater consumer environmental awareness

Greater nature related resilience
- E1 S2 S3 Infrastructure development for drainage, etc.
- N1 N2 N4 Restoration of environmental conditions

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Industry changes: Scenario (I)-B (Customer: Small Mass)

Supply chains become complex and decentralized to meet diversifying needs. There is discord between governments and consumers as environmental measures become inadequate.

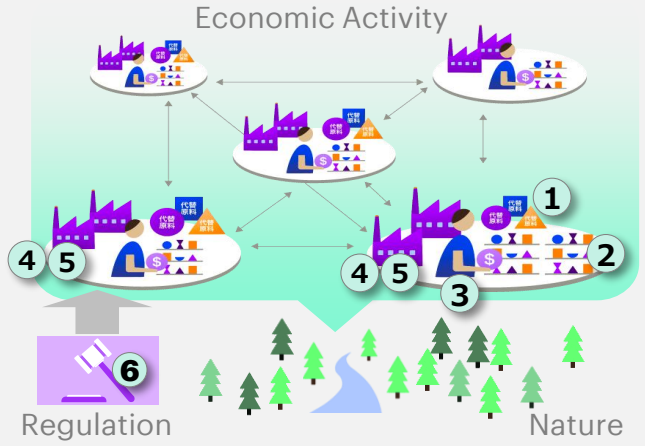
Changes in economic and social situation

Category of change	Key changes
Natural environment	Conservation efforts progress, and **both the climate and ecosystems recover**
Politics and regulations	Public administrations and international organizations **actively intervene** (6) **in nature conservation**, including the regulation of business (1).
Society	Consumer **needs diversify** (4), and **environmental considerations** are added (2) to needs, reflecting environmental awareness
Economy	**Economic development** through global cooperation. Developed and developing countries both grow, and **disparities shrink** (3). Along with this, **production factories** are decentralized in each country (4)
Technology	**Technological development is activated** with progress in new investment and the launch of startups (5)

Industry changes occuring from social and economic changes in next section

Changes in consumer goods ind.

As locally produced products are popular with short Lead Time, supply chain becomes decentralized



Product changes

1 Spread of **alternative raw materials**

2 Greater **product diversity** due to **greater diversity of needs**

Business scale changes

3 **Increase in average spending per customer**

Change in degree of integration

4 **Decentralization through local production and shorter Lead Time**

5 Partial **outsourcing** of factories

Change in risk occurrence probability

6 Growing **transition risk**

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More dependence and impact by area
Less dependence and impact by area

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Industry changes: Scenario (I)-B (details)

Strict conservation regulations come into effect as consumer needs become more refined and diverse. In the "Small Mass" segment, companies need to provide additional value of the products, while facing regulations in diverse areas.

Macro changes

Natural environment

- N1 Lower GHG (Rising temp)
- N2 Forest restoration
- N3 Water shortage accelerated
- N4 Less waste and pollution

Politics and regulations

- P1 Environmental protection: Strict
- P2 International cooperation: Proactive
- P3 International organizations: Greater influence

Economy

- E1 Growth: Focused on developing countries
- E2 Disparity: Reduced
- E3 Globalization: Facilitated

Society

- S1 Population: Slight increase
- S2 Urbanization: Progressing
- S3 Sanitation access: High
- S4 Consumption: Quality and low resources

Technology

- T1 New development: Fast
- T2 Energy: Preference for renewables
- T3 Agriculture: Better yields

Industry changes

Oil wells → Plantations/production forests → Material manufacturing → Final product manufacturing → Consumption

Product changes
Will product dependence and impact increase?

More options for certified/alternative materials

More demand for low-resource materials
- S4 Environmental orientation

Spread of alternative materials
- P1 Lower cost gap due to regulations
- T1 Expansion of algae fats and oils, etc.

Greater product diversity following sophistication of consumer needs

Diversification of needs
- S2 S4 Sophisticated and environmentally-oriented needs
- E1 E2 Higher earnings

Scale changes
How much volume is provided?

Market expands, but due to an increase in average spending per customer

Greater inclination to pay for environmental value
- S1 Rise of environmentally-oriented consumption

Slight increase in consumers
- S1 End of population growth

Change in degree of integration
Will dependence and impact be concentrated?

Decentralization with preference for local production for local consumption

Rise of preference for local production for local consumption
- S4 Greater need for local products

Decentralization and outsourcing through raising added value

Decentralization
- S4 Shorter LT, localized
- E2 Less wage gap
- T1 Diversified supplier

Outsourcing
- S4 Accelerated focus on R&D
- T1 New materials, ventures

Developing countries expand

Developing countries' markets expand
- E1 More refined consumption in developing countries

Changes in probability of risk
Will the response to dependence and impact be more severe?

More severe transition risk exposure line, including regulations and reputation

Stricter supervision
- P1 Strict regulations (forest conservation, etc.)
- P2 P3 Intervention by international organizations
- S4 Greater consumer environmental awareness

Greater nature related resilience
- E1 S2 S3 Infrastructure development for drainage, etc.
- N1 N2 N4 Restoration of environmental conditions

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Industry changes: Scenario (II)

Protective trade forces companies to operate in environmentally fragile areas and increase their dependence on certain areas, which exacerbates physical risks.

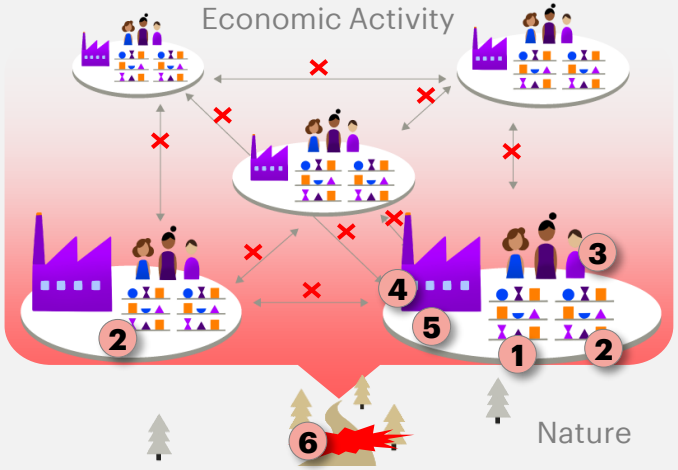
Changes in economic and social situation

Category of change	Key changes
Natural environment	**Nature degradation is serious** and disaster damage is becoming apparent (6)
Politics and regulations	**Limited** regulations and **interventions** by international organizations **International specialization decelerates** due to conflict in the international community (2)
Society	Consumers have low environmental awareness (1) and **prefer** price-focused **mass consumption** (5)
Economy	Population increases (3), but **trade barriers strengthen** (4), so the economy stagnates, and **wage disparities expand**
Technology	**Technological innovation slows down** due to stagnated investment

Industry changes occuring from social and economic changes in next section

Changes in consumer goods ind.

As protective trade and natural disasters interfere, supply chains are heavily hampered



Product changes

1 **Limited alternative** raw materials

2 More **product type** with due to divided economic **block**

Business scale changes

3 Expands due to **population growth**

Change in degree of integration

4 **Decentralization through protective trade**

5 **Upsizing in** each **country** with **economies of scale**

Change in risk occurrence probability

6 Growing **physical risk**

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More dependence and impact by area
Less dependence and impact by area

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Industry changes: Scenario (II) (details)

As supply chains become hampered due to trade protectionism and natural disasters, companies must face declining gross profits due to high volatility in material cost and fierce cost competition, while strengthening their BCP measures.

Macro changes

Natural environment

- N1 Higher GHG (Rising temp)
- N2 Reduced forests
- N3 Water shortage accelerated
- N4 More waste and pollution

Politics and regulations

- P1 Environmental conservation: Limited
- P2 International cooperation: Limited
- P3 International organizations: Less influence

Economy

- E1 Growth: Stagnant
- E2 Disparity: Increased
- E3 Globalization: In retreat

Society

- S1 Population: Growing in developing countries
- S2 Urbanization: Stagnating
- S3 Sanitation access: Low
- S4 Consumption: High-volume consumption

Technology

- T1 New development: Slow
- T2 Energy: Self-supply with renewables
- T3 Agriculture: Unchanging yields

Industry changes

Oil wells → Plantations/production forests → Material manufacturing → Final product manufacturing → Consumption

Product changes
Will product dependence and impact increase?

No progress for certifications/alternative materials

Quantity-focused consumption
- S4 E1 Consumption continues to focus on low prices and quantity

Higher costs
- S1 N2 N3 N4 Rise in energy price Shortage of lumber /water supplies

Greater product diversity with manufacturing by economic block

Protective trade, increased self-sufficiency rate
- E3 Stronger trade barriers
- P2 Slowed international specialization

Scale changes
How much volume is provided?

Scaling up due to population growth in developing countries

More consumers
- S1 Expanded customer segments

Change in degree of integration
Will dependence and impact be concentrated?

Decentralized, but larger within each country

Protective trade, increased self-sufficiency rate
- E3 Stronger trade barriers
- P2 Slowed international specialization

Spread in developed/developing countries
- E2 Greater wage disparity
- E3 P2 Protective trade

Larger x more concentrated production
- E1 S2 S4 Price-focused consumption
- S1 N2 N3 N4 Higher operation costs

Developing countries expand

Developing countries' markets expand
- S1 More customer segments

Changes in probability of risk
Will the response to dependence and impact be more severe?

More severe physical risk exposure line due to environmental degradation

Limited supervision
- P1 Limited regulation
- P2 P3 Insufficient intervention by international organizations
- S4 Lack of environmental orientation among consumers

Less nature related resilience
- S1 E1 S2 S3 Growing proportion of developing countries with delayed infrastructure, including drainage
- N1 N2 N4 Worse environmental conditions

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Key points of Analysis #2 Detailed Scenario

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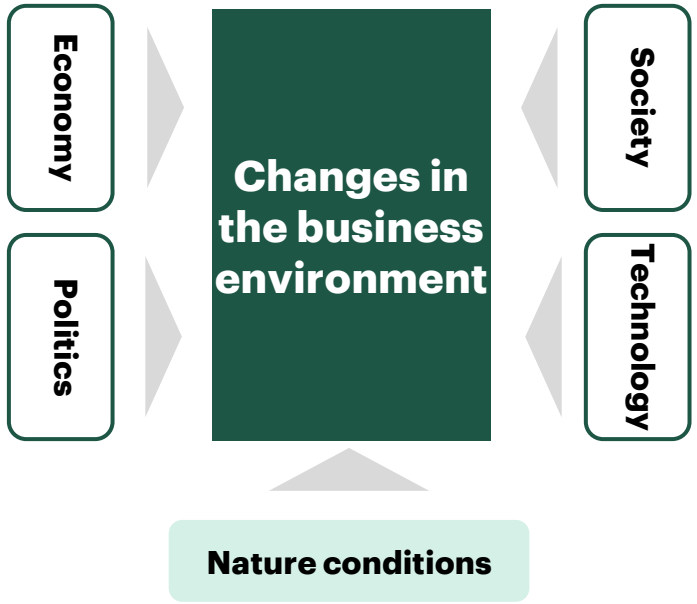
Creating scenarios using a wide range of variables, including those other than nature, has allowed us to secure future "volatility" in a multifaceted way, which is important in scenario analysis.

Features of this study

In addition to nature, environmental and industry aspects that will change in conjunction with nature have also been taken into account and scenarios have been detailed



Advantages of these features

This facilitated an analysis which covered several aspects of different scenarios. As a result, we could clarify risks in vivid detail and reveal the risks that should be closely observed for each scenario (details in the next chapter)

Analysis Measures	Example: Scenario X	Differences in subsequent risk analysis content
Scenario analysis **only with nature** Nature conditions	• **Environmental awareness rises** and **nature is conserved**	**High-level link between external environment and risk can only lead to general analysis of the risk** (Nature is recovering/ low physical risk etc.)
Scenario analysis **with nature and macro environment** Nature conditions + **Changes in economy and society**	• Through **higher environmental awareness across society,** supply chains turn to **local production for local consumption**. Government places **stricter environmental regulations** etc.	**Elaborated analysis is possible by linking external environment to risk and understanding background where risks arise** (Stricter regulations is problematic on its own, but when combined with the trend towards local production leads to diversification of correspondence matter and further risks. etc.)

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Chapter 3

Priority risks and mitigation measures for each scenario

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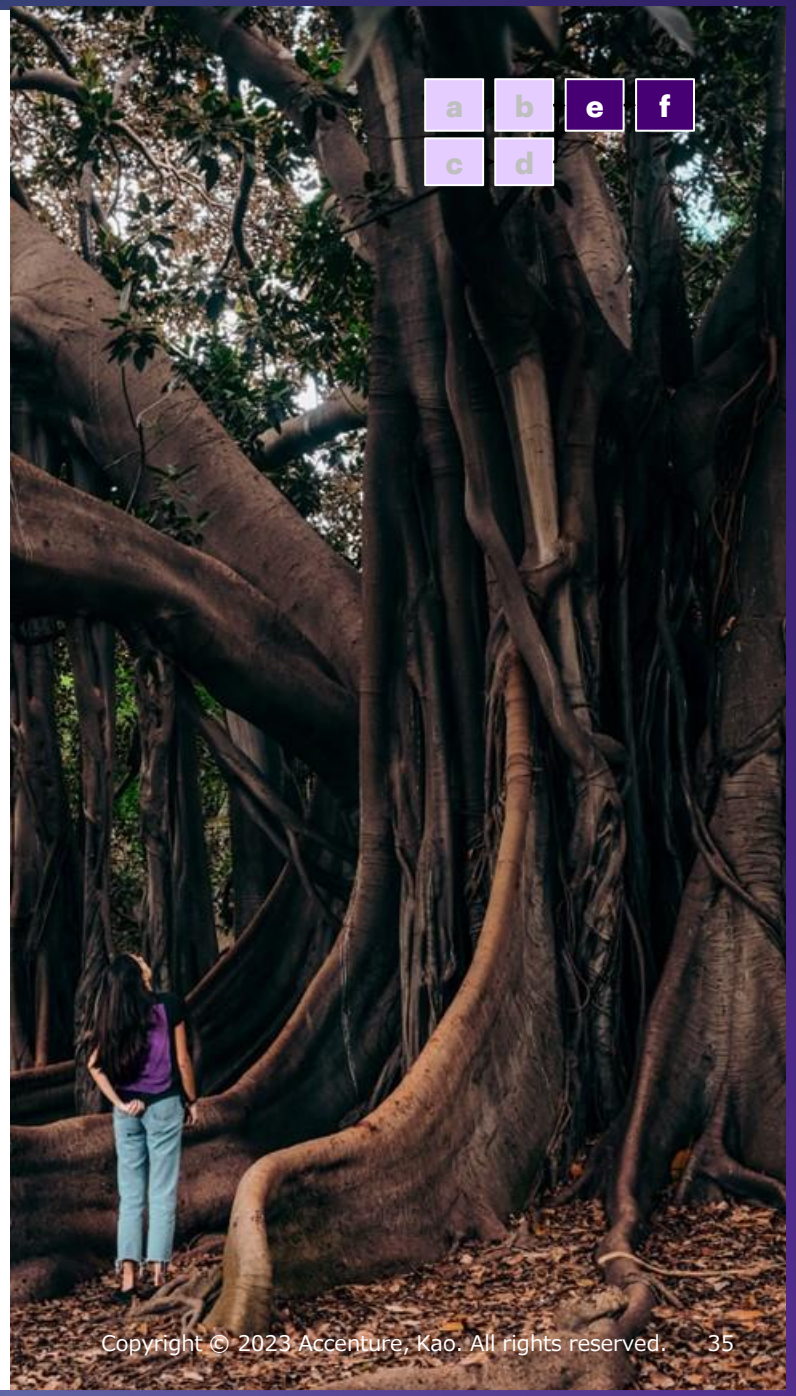
Chapter 3
Priority risks and mitigation measures for each scenario [Conclusion]

In addition to analysing distant future, it is essential to initiate risks mitigation measures. With the uncertain external environment today, it is important to identify and prepare for: impactful risks not only in highly likely scenarios but also in each macro scenario, and the risks that are common to multiple scenarios.

- As previously written, the relation of business and nature and priority risks will chang as external environment change.
- Given the unstable political/economic environment and the increasing natural disasters, significant loss cannot be avoided, when businesses focus only on highly likely scenarios or risks which can be foreseen from the current circumstances. By identifying the priority risks for each scenario, companies will be able to take risk mitigation measures immediately, when they face with changes in business environment. It is essential to prioritize, risks with higher impact or risks which are common between several scenarios
- In Kao case study priority risks were: for Scenarios (I), risk of conflicting stricter regulations for nature conservation and stakeholder negotiation risks such as animosity from consumers and NGOs are the priority risks. For Scenario (II), risks in stable procurement of material, caused by unstable production due to decreased protective functions by nature degradation, and high volatility in costs are the priority risks.

There are a numerous ways to mitigate risks, including measures to reduce business dependence and impact, or to acquire the capital (talent, finances, stakeholder relationships, etc.) .

- For example, Kao's actions include "efficiency" through developing detergents base with efficient resource use, "reusing" waste PET plastic, and internal carbon pricing that led to optimizing the use of "financial" assets in environmental aspect



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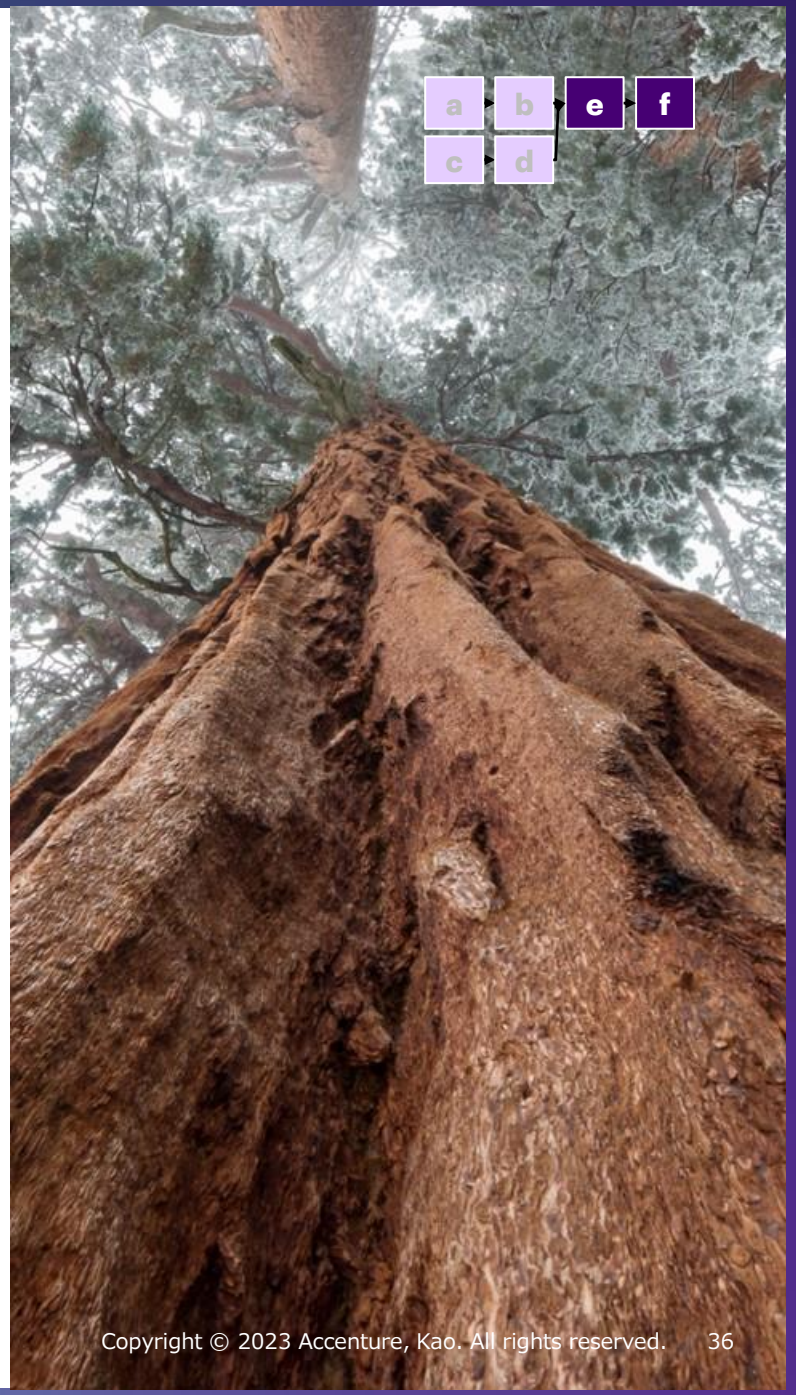
Chapter 3
Priority risks and mitigation measures for each scenario [Conclusion]

Here, we identify risks that should be monitored and risk mitigation measures for each scenario.

In this case study, (e) we narrowed down the risks to monitor for each scenario, based on the direction of macro environmental changes and the status of nature degradation, from among the biodiversity-related risks defined by TNFD. We then (f) identified the existing actions and ones that should be reinforced, to counter the important risks that were identified.

- (e): Assess the probability of occurrence of each type of risk based on the direction of industry changes. Furthermore, narrow down the important risks by assessing the scale of damage in the event of the risks occurring, based on the state of nature degradation and dependence on nature
- (f): Organize existing actions. Identify ones to be reinforced in the future



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Impact	L	M	S
Probability	VH	H	M	L

: Risk Impact for each scenario L=Large, M=Middle, S=Small

: Risk probability for each scenario
VH=Very High, H=High, M=Middle, L=Low

: priority risks in each scenario

*Selection criteria for priority risks
M+ impact and H+ probability

Priority Risks: Overview

When assessed by two indicators - business impact and probability of occurrence, priority risks in Scenario (I)-A/B is transition risk. Whereas for Scenario (II), it is both physical and transition risk.

			Scenario (I)-A			Scenario (I)-B			Scenario (II)		
			Impact	Probability		Impact	Probability		Impact	Probability	
Physical		Changes to the **supply of natural inputs**	S	M	Nature recovers	S	M	Common with (I)-A	S	VH	Nature deteriorates rapidly
Physical		Changes to **protection from natural hazards**	L	L	Both nature and climate recover	L	L	Common with (I)-A	L	H	Both nature and climate deteriorate
Transition	Policy and Legal	Strict **legislatrion/ regulation**	L	H	Strict regulations enacted	L	H	Common with (I)-A	L	L	Regulations are limited
Transition	Policy and Legal	More stringent **reporting obligation**	M	VH	Strict disclosure standards enacted	M	VH	Common with (I)-A	M	L	Disclosure requirements are limited
Transition	Market	**Volatility/change to costs** of materials	L	H	Increased demand, but so is supply	L	H	Common with (I)-A	L	VH	Decreased supply due to economic stagnation
Transition	Market	Conflict with **stakeholders**	S	VH	Environment conscious consumers	S	VH	Common with (I)-A	S	M	Consumers are indifferent to the environment
Transition	Market	Changing **investor preferences**	S	VH	Investors value conservation	S	VH	Common with (I)-A	S	L	Investors disregard nature
Transition	Market	Changing **consumer preferences**	M	VH	Environment conscious consumers	M	VH	Common with (I)-A	M	L	Consumers are indifferent to the environment
Transition	Reputation	Decline in **brand proposition**	M	VH	Conservation increases brand value	M	VH	Common with (I)-A	M	L	Conservation and branding are unrelated
Transition	Technology	Pressure to introduce **new technology**	S	VH	Increased investment Stimulates development	S	VH	Common with (I)-A	S	L	Technology investment stagnates

→ In the following sections, priority risks are described in light of Scenarios (I)-A/B and (II)

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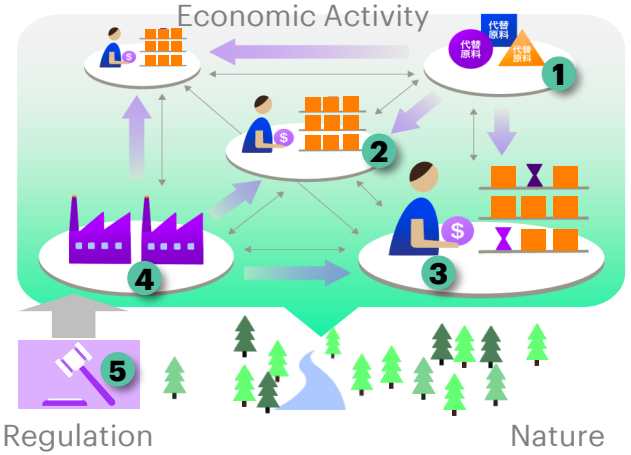
Case Study

Priority Risks: Detail - Scenario (I)-A

In a world where nature conservation and economic growth are in alignment, companies who cannot follow strict regulations may face brand damages. Especially, regarding products for the "Mass" or the largest tier of commodity consumers who increasingly pay attention to the centralized supply chain.

As limited high quality /environment-friendly products take over the market, supply chain become concentrated



Product changes

1. Spread of **alternative raw materials**
2. **Lower number of products with emphasis on quality and environment**

Business scale changes

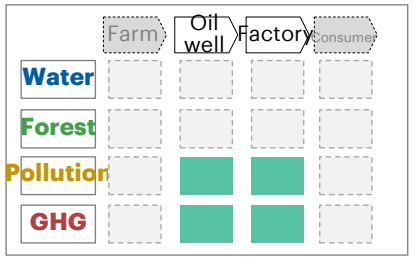
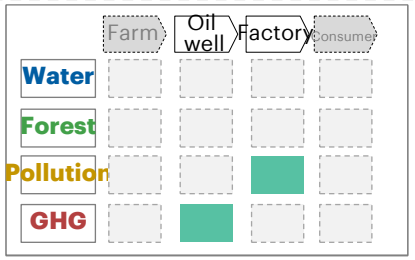
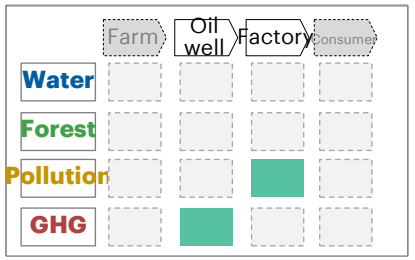
3. **Increase in average spending per customer**

Change in degree of integration

4. **Increased concentration through continuous markets and international specialization**

Change in risk occurrence probability

5. Growing **transition risk**

	Risk	Process x Nature	Risk details
Policy and Legal	**Strict legislatrion/ regulation**		• Pollution as well as production restrictions result in higher costs • Consolidated small factories have limited operating days due to pollant and GHG emission limits, resulting in lower sales
Policy and Legal	**More stringent reporting obligation**		• Decline in corporate value due to inadequate GHG emission measures as well as reduction targets through oil consumption • Decline in corporate value due to inadequate response against pollution control measures required at the consolidated manufacturing factories
Market	**Volatility/ change to costs** of materials		• Cost instability due to pollution regulations at consolidated manufacturing factories, violations of GHG emission regulations at oil wells, and production restrictions • Also, overall market demand increases along with economic development

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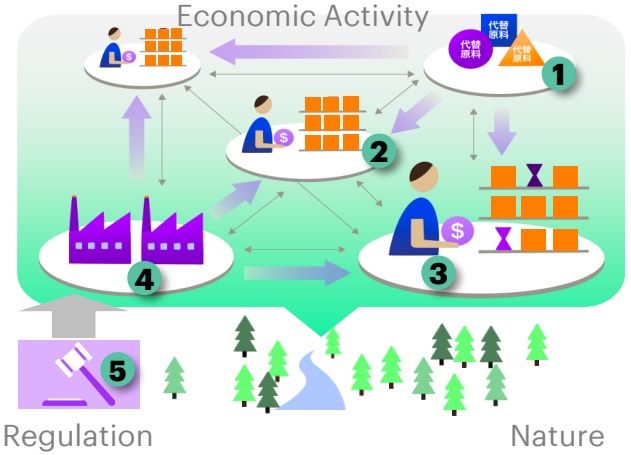
Case Study

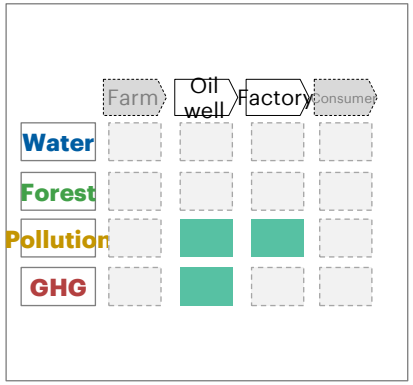
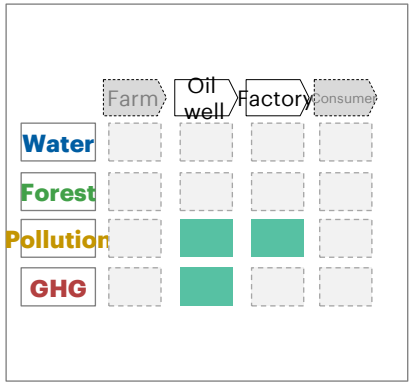
Priority Risks: Detail - Scenario (I)-A

In a world where nature conservation and economic growth are in alignment, companies who cannot follow strict regulations may face brand damages. Especially, regarding products for the "Mass" or the largest tier of commodity consumers who increasingly pay attention to the centralized supply chain.

As limited high quality /environment-friendly products take over the market, supply chain become concentrated



Product changes	Business scale changes
1 Spread of **alternative raw materials** 2 **Lower number of products with emphasis on quality and environment**	3 **Increase in average spending per customer**
Change in degree of integration	**Change in risk occurrence probability**
4 **Increased concentration through continuous markets and international specialization**	5 Growing **transition risk**

	Risk	Process x Nature	Risk details
Market	**Changing consumer preferences**		• There are Consumer demand regarding pollution and GHG control measures in centraized supply chains. Failure in meeting their demand may result in lower sales
Reputation	Decline in **brand proposition**		• In the situation where most of the companies make effective environmental measures, pollution at centralized supply chain(oil wells and factories) will damage brands and corporate value will decrease

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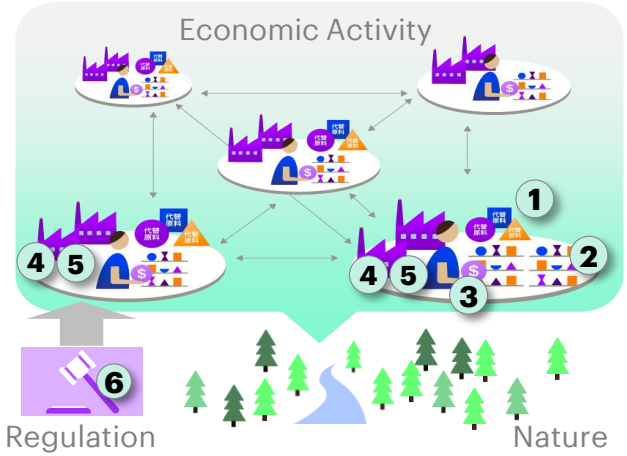
Case Study

Priority Risks: Detail - Scenario (I)-B

In a world where nature conservation and economic growth are in alignment, companies who cannot follow strict regulations may face brand damages. These risk may occur, especially regarding products for the "Small Mass" due to increased contact with nature as supply chains are decentralized.

As localy produced products are popular with short Lead Time, supply chain become decentralized



Product changes

1 Spread of **alternative raw materials**

2 Greater **product diversity** due to **greater diversity of needs**

Business scale changes

3 **Increase in average spending per customer**

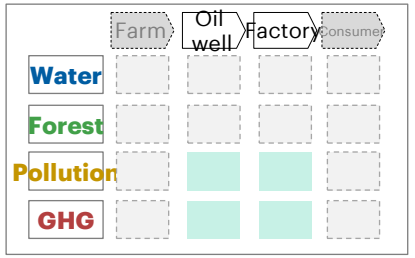
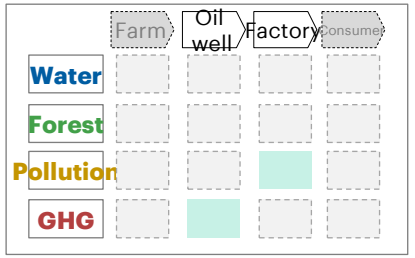
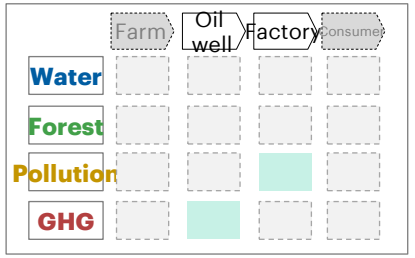
Change in degree of integration

4 **Decentralization through local production and lower Lead Time**

5 Partial **outsourcing** of factories

Change in risk occurrence probability

6 Growing **transition risk**

	Risk	Process x Nature	Risk details
Policy and Legal	**Strict legislatrion/ regulation**		• Pollution regulations at multiple oil suppliers results in less production and higher costs • factories in multiple regions have limited operating days due to pollant and GHG emission limits, resulting in lower sales
Policy and Legal	**More stringent reporting obligation**		• Decline in corporate value due to inadequate GHG emission measures and targets for oil procurement • Decline in corporate value due to evaluation for inadequate efforts against increased pollution control requirements across dispersed factories
Market	**Volatility/ change to costs of materials**		• Cost instability due to production restrictions for violating pollution and GHG emission regulations at increased number of factories and oil wells in the dispersed area • Also, overall market demand of supply increases with economic development

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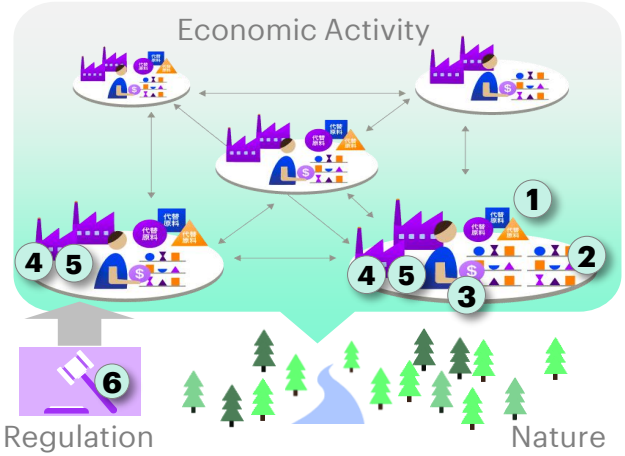
Case Study

Priority Risks: Detail - Scenario (I)-B

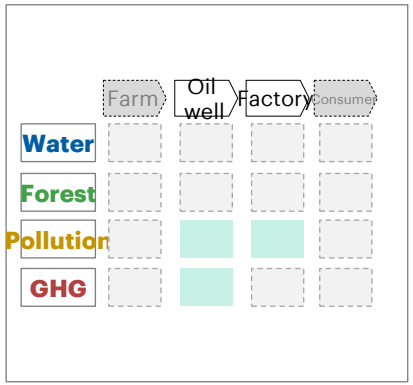
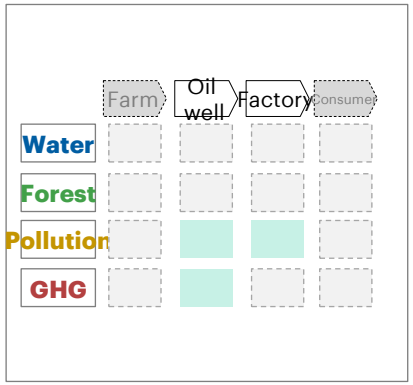
In a world where nature conservation and economic growth are in alignment, companies who cannot follow strict regulations may face brand damages. These risk may occur, especially regarding products for the "Small Mass" due to increased contact with nature as supply chains are decentralized.

As localy produced products are popular with short Lead Time, supply chain become decentralized



Product changes	Business scale changes
1 Spread of **alternative raw materials**	3 **Increase in average spending per customer**
2 Greater **product diversity** due to **greater diversity of needs**	

Change in degree of integration	Change in risk occurrence probability
4 **Decentralization through local production and lower Lead Time**	6 Growing **transition risk**
5 Partial **outsourcing** of factories	

	Risk	Process x Nature	Risk details
Market	**Changing consumer preferences**		• There are Consumer demand regarding pollution and GHG control measures in localized supply chains. Failure in meeting their demand may result in lower sales
Reputation	**Decline in brand proposition**		• In the situation where most of the companies make effective environmental measures, pollution at localized supply chain(oil wells and factories) will damage brands and corporate value will decrease

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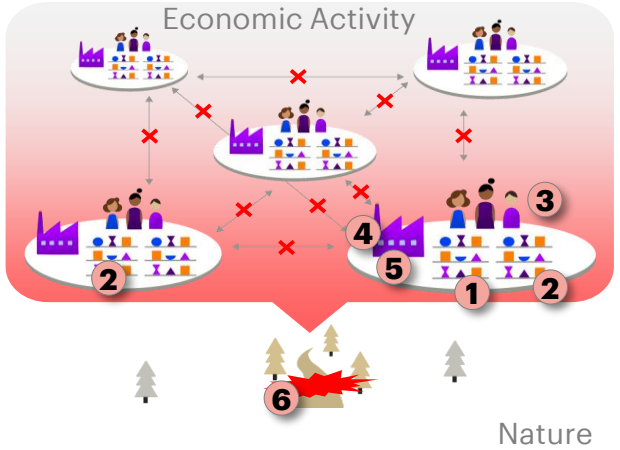
Case Study

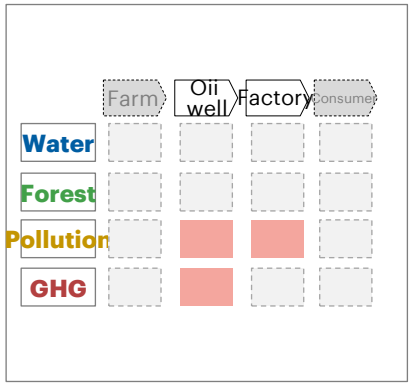
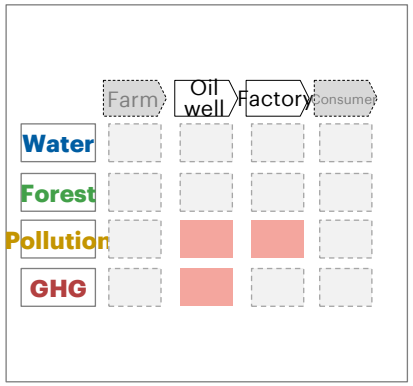
Priority Risks: Detail - Scenario (II)

In Scenario (II), societies neglect nature conservation and leads to severe deterioration of nature. Each country prioritizes its own benefit causing economic fragmentation that further leads to stagnation. As a result, physical risks has significant impact, causing procurement of raw material to be quite unstable.

As protective trade and natural disasters interfere, supply chains are heavily hampered



Product changes	Business scale changes
1 **Limited alternative** raw materials 2 More **product type** with due to divided economic **block**	3 Expands due to **population growth**
Change in degree of integration	**Change in risk occurrence probability**
4 **Decentralization through protective trade** 5 **Upsizing in** each **country** with **economies of scale**	6 Growing **physical risk**

	Risk	Process x Nature	Risk details
Physical	Changes to **protection from Natural hazards**		• Severe nature deterioration includes deforestation in area where oil wells reside. This results to physical damage from natural desasters. • GHG emissions from oil wells leads to global warming, acid rain, and physical damage in downstream processes
Market	**Volatility/ change to costs** of materials		• Severe nature deterioration reduces productivity and destabilizes costs at oil wells and factories • Also, each country prioritizes its own economy, resulting in economic fragmentation and accelerating cost instability

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Case Study

How companies should handle risks

In addition to analyzing the possible risks, companies should adopt effective mitigation measures. With high uncertainty,it is important not just to identify highly possible scenarios, but also to identify and prepare for risks that are particularly impactful in unlikely scenarios or risks that are common across multiple scenarios.

			Scenario (I)-A		Scenario (I)-B		Scenario (II)	
			Impact	Probability	Impact	Probability	Impact	Probability
Physical		Reduced supply functions	Small	Medium	Small	Medium	Small	**Very High**
Physical		2 Reduced protective functions	**Large**	Low	**Large**	Low	**Large**	High
Tran-sition	Policy and Legal	Stronger conservation regulations	**Large**	High	**Large**	High	**Large**	Low
Tran-sition	Policy and Legal	More complex demands for disclosure	Medium	**Very High**	Medium	**Very High**	Medium	Low
Tran-sition	Market	1 Cost destabilization	**Large**	High	**Large**	High	**Large**	**Very High**
Tran-sition	Market	Conflict with stakeholder conflict	Small	**Very High**	Small	**Very High**	Small	Medium
Tran-sition	Market	Changes in investor preferences	Small	**Very High**	Small	**Very High**	Small	Low
Tran-sition	Market	2 Changes in consumer preferences	Medium	**Very High**	Medium	**Very High**	Medium	Low
Tran-sition	Reputation	Brand damage	Medium	**Very High**	Medium	**Very High**	Medium	Low
Tran-sition	Technology	Pressure to introduce new technology	Small	**Very High**	Small	**Very High**	Small	Low

1 **Priority Risks* shared across multiple scenarios**

2 **Priority Risks* with high impact and probability of occurrence in each scenario**

*Selection criteria for Priority risks
M+ impact and H+ probability
▭ : Priority risks in each scenario

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Types of Risk Control Options

Risk control can be categorized into: direct measures – that directly reduce dependency and impact; and indirect measures– that acquire capital to promote these actions. When considering effective measures these categories will be supportive for listing possible measures thoroughly.

Types of control		Overview	Sample actions
Reduce dependency and impact (Direct Measures)	**Avoid**	• Reduce frequency of resource use, its dependency and impact	• Alternative materials
	Efficiency	• Reduce dependency and impact per unit of activity	• Water saving in plants
	Reuse	• Increase the number of times resource is used per unit to reduce the frequency of dependency and impact	• Container recycling
	Regenerate	• Counteract dependency and impact with parallel business and conservation activities	• Factory greening
Acquire and circulate capital to support actions (Indirect Measures)	**Human resources**	• Recruit and develop human resources necessary for conservation actions	• Development and acquisition of conservation HRs
	Finance	• Raise funds necessary to accelerate actions • Select investments with low environmental impact	• Green bonds
	Information	• Centralize information on environmental conditions, the company's dependency and impact	• Aggregating incident information
	Network	• Strengthen collaboration with stakeholders	• Strengthening supplier collaboration

Details shown in Kao's sample actions (covering Efficiency, Reuse and Finance) in the following pages.

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Case Study

Sample of [Efficiency] “Detergent base with efficient resource use"

Kao’s corporate culture which accepts long term research for future solution, realized the implementation of sustainable detergent bases in products.

Overview

Detergent base “Bio IOS"

- Detergent materials are expected to face shortage in the future due to population growth
- Detergent are required to have cleaning power and good rinsing ability

Results

Enabled the use do solid oils and fats (sustainable raw materials), which had limited applications conventionally .

Technological Development Realized Good Cleaning and Rinsing

Background and characteristics

Creating the Innovation of Sustainable Detergent

Start of research (2008)

Anticipating the shortage of detergent bases due to the global population growth, research was started to utilize solid oils and fats (sustainable raw materials), which had limited applications.

Practical use (2018)

After 10 years of research, Kao developed a cleaning ingredient that achieves high cleaning effect with small amount and enables rinsing with less water.

Products

Bio IOS Compounded products

Sustainable raw materials

Enabled the use of solid oils and fats, which only had limited usage, generated as remaining portion during the production of cooking oil

High cleaning effect with small amount / Rinsing with less water

Molecular Structure Model of Bio IOS

Blends well with oil and exerts high cleaning power in small amounts. Has very high water-solubility and enables rinsing with less water

Hydrophilic group: part that blends with water
Oily group: part that blends with oil
Special structure in which a hydrophilic group is located in the middle of a long oily group

Success factor

Point (1)
Future-oriented research theme setting

Point (2)
Wide range of research topic as a final product manufacturer

Point (3)
Acceptance for research as a corporate culture
“Go far as you can publish a book”

Details of above Kao action can be found at Kao website[8]

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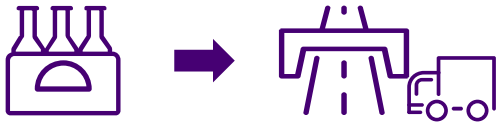
Sample of [Reuse] "Upcycle of Waste PET"

In addition to containers for cosmetics, laundry detergents, and dishwashing detergents, Kao uses recycled materials in its chemical business. A modifier that increases the strength of asphalt pavement was developed using proprietary technology.

NEWTLAC 5000



Overview

- Using waste PET to produce a reinforcing agent for asphalt pavement
- Adding 1% to asphalt pavement material increases durability by 5 times.

Results

- Approximately 1,430 PET bottles can be used to build 100 m^2 of paved road surface
- The asphalt modifier Improves resistance of pavement deformation, making pavement looking beautiful longer and reduces the frequency of resurfacing

Background and characteristics

Contributing to a circular society and enhancing customer value by leveraging Kao's core technologies

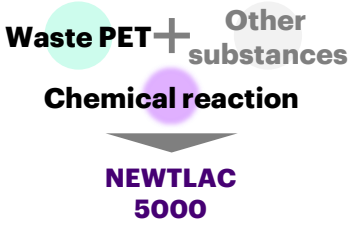
Using recycled PET waste as raw material

- Considering the use of waste PET amid growing momentum for contributing to a circular society

Maintaining safe and beautiful roads

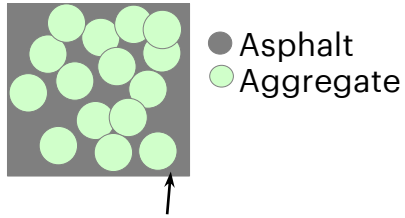
- Kao found the road pavement field as a potential application for its functional molecular design technology.

Functional Molecular Design Technology Avoids Release of Waste PET into the Environment



PET is not added to asphalt as it is, but chemically reacts with a modifier to prevent PET from being released into the environment when the road is used.

Applying technology to control interfacial properties to reinforce asphalt durability



Analysis of the interface enables the production of a modifier that increases the affinity of the two materials of pavement.

NEWTLAC improves affinity between asphalt and aggregate

Success factor

Point (1)
Perspectives on Contributing to a Circular Society

Point (2)
Ongoing efforts to improve customer value

Details of above Kao action can be found at Kao Website[9]

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Sample of [Finance]: "Internal Carbon Pricing"

Kao raised its carbon prices in line with growing interest in decarbonization, enabling investment in low-CO_2 operations through large-scale investments in manufacturing and logistics.

Overview

Internal Carbon pricing

- Investment decisions were made on EVA* bases with the economical value of CO_2 emissions reductions included by Internal Carbon pricing(ICP)

∗ Economic Value Added

Results

GHG emission reduction by 20%* at all sites

(Avoiding the use of oil resources)

*2020 results compared to 2017.
Includes impacts other than ICP actions

Background and characteristics

Kao set comparatively high carbon price and made large-scale investment in manufacturing and logistics based on economical advantage when ICP is applied.

Introduce ICP (2006)

With the momentum of the Kyoto Protocol coming into effect in the previous year, Kao introduced ICP at a low price point, ahead of other companies in the world(3500 yen/tGHGe)

Raise carbon price (2020)

Kao raised its carbon price to 18,500 yen/tGHGe, according to the 2035 carbon tax assumption, in response to growing interest in decarbonization

Investment (1) Manuacturing

Installed solar power generation equipment at the Tochigi Factory, and purchased electricity with "non-fossil certification"

Investment (2) Logistics

RORO ships, which emit less carbon than trucking (a transport method in which the cargo part of a truck is transferred to a ship), have been put into regular service

Success factor

Point (1) Early adoption of advanced structure

Point (2) Operations reflecting external environment

Point (3) Top management makes final approval

Flow of carbon pricing

ESG governance system

Board of Directors

ESG Committee

Internal Devisions / Subsideries

ESG committee assess and approve the investment

Details of above Kao action can be found at Kao website 1 [10] ,Kao website 2[11]Kao Website3[12]

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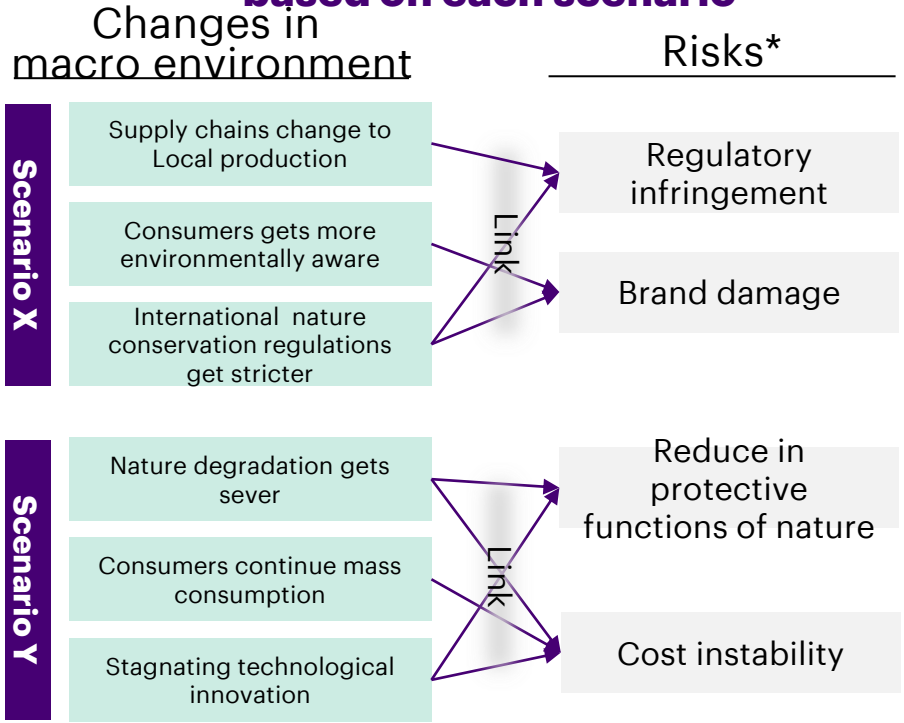
Key points of Analysis #3 Linking risks to external changes

By narrowing down the important risks of each scenario, when signs of external environmental changes appear, companies can brace and respond swiftly for the future risks.

Features of this study

Rather than just listing up risks, we narrowed down the risks which should be monitored based on each scenario



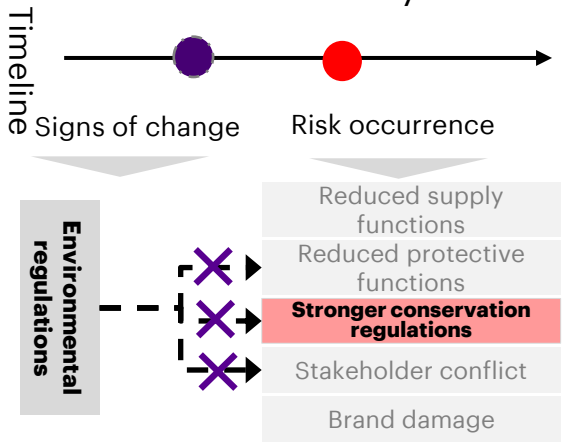
*Risks described partially.
Non-exhaustive

Advantages of these features

When signs of external changes appear, it will be possible to link the sign to future risks to respond swiftly

Listing up possible risks

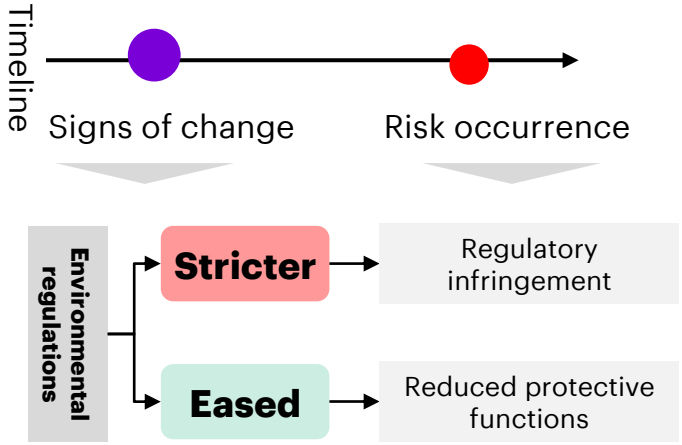
When initial changes cannot be linked to changes, companies experience risks arise suddenly



Unable to anticipate risks from the signs of change

Link changes with risks

Companies can prepare for risks the instant companies recognize signs of change



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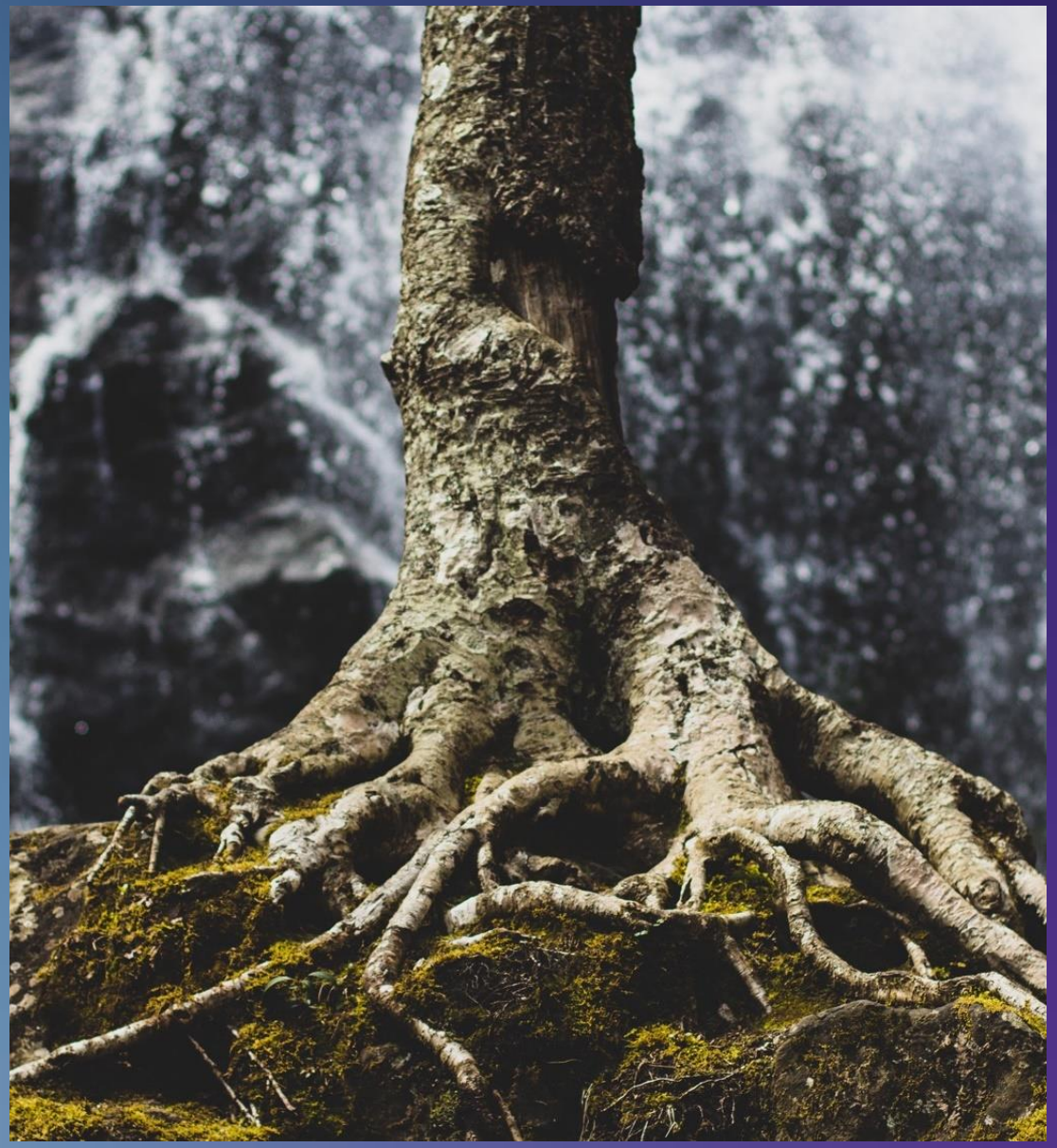
Chapter 4

Business Opportunities



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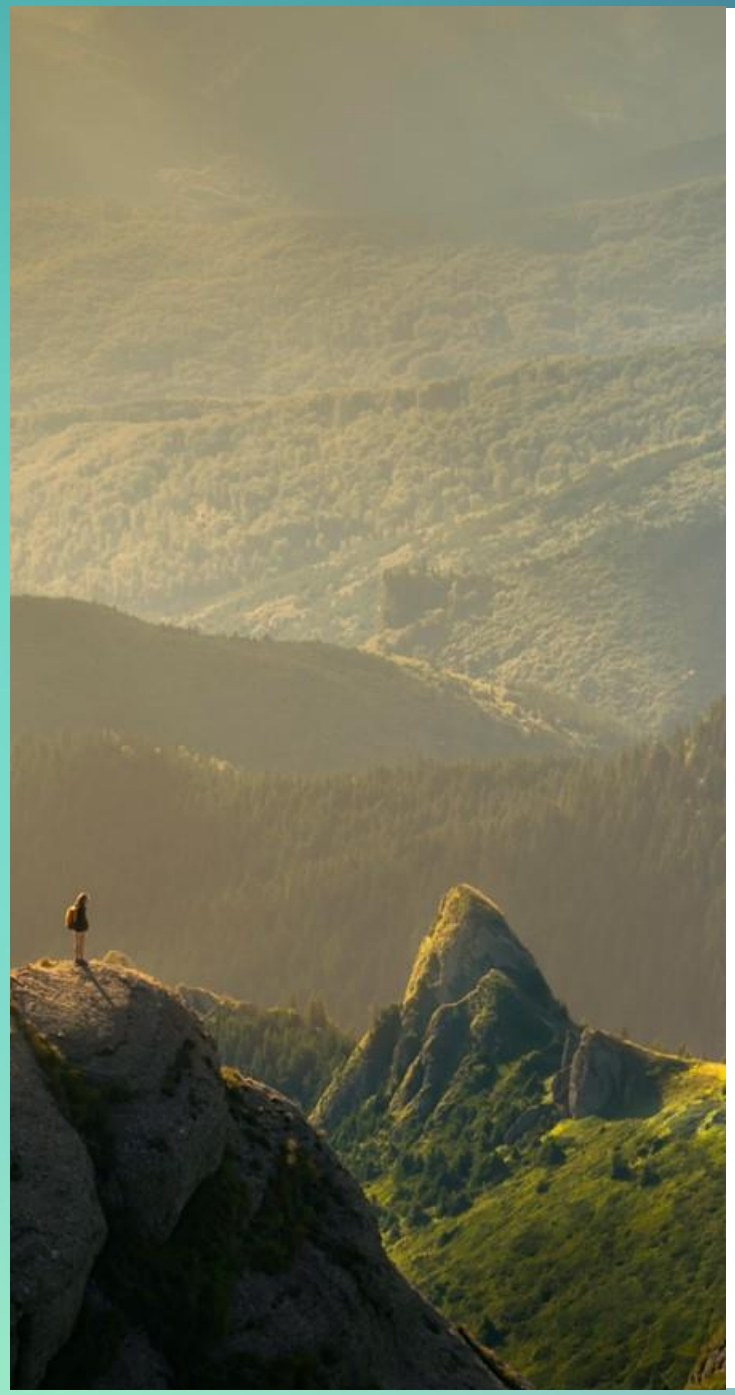

Chapter 4
Business opportunities [Conclusion]

Chapter 4 describes examples of general business opportunities not focusing only on the results of Kao's case study up to the previous chapter. Note that these examples of business opportunities do not necessarily indicate Kao's intention to enter the market, and Kao and Accenture make no guarantees or promises regarding these examples of business opportunities.

Opportunities related to nature are defined by TNFD as "activities that have a positive impact or reduce a negative impact on nature and are beneficial to the company or nature". Actions are not necessarily limited to measures to avoid risks and should include those to create more positive effects.

When aiming for a greater risk reduction effect or new revenue generation, it is necessary not only to improve existing operations but also to drastically innovate the operations themselves.

- Risk management actions, such as reduction of dependency/impact and acquisition/circulation of required capital, can be classified by their "depth," and can range from (1)a relatively minor review of existing operations to (2)a drastic overhaul of operations using new technologies
- (1) is required as a premise common to all companies and should be addressed first when avoiding business risks. (2) should also be considered in the mid-term since large investments and large improvement/impact are expected.
- In this survey, (2) is defined as a new business opportunity and specific examples are given.

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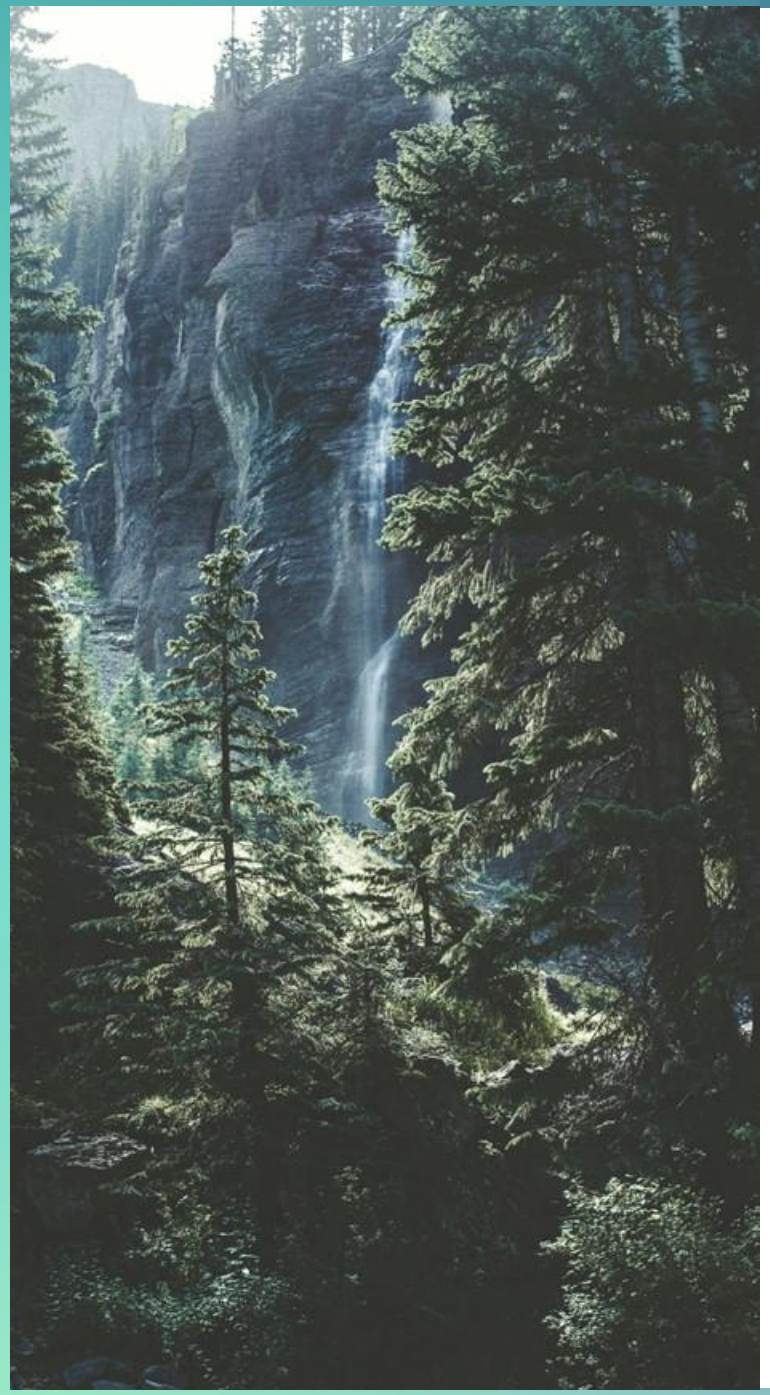
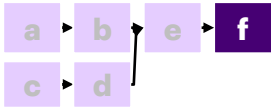


Chapter 4
Business opportunities [Approach]



In this step, we have identified business opportunities for non-continuous growth, that have already emerged, and further market expansion is expected in the short to medium term.

- Of the more than 1,000 investments by U.S. and Japanese venture capital, we have identified approximately 300 businesses as potential opportunities that contribute to the reduction of dependence on and impact on nature, or to the acquisition/circulation of capital required for such the reductions
- Those business areas are classified into 10 types opportunities that directly reduce dependence/impact and 7 types of opportunities that support these actions.
- To evaluate priority of the businesses, we accounted for both "potential contribution to business" and "potential contribution to nature"
- In this report, the results of the evaluation based on "potential market size" for the former and "reduction effect in environmental impact" for the latter are presented as examples. In this evaluation, the characteristics of different types of industries are not considered.

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Definition of Business opportunities

This study seeks to capture business activities that directly mitigate dependency and impact on nature, and activities which acquire capitals to continue the former action. Among activities aimed at improving existing operations, "new business opportunities" are defined as those that provide greater environmental impact risk reduction benefits by inovating operations and those that generate new revenue through external sales.

Types of nature risk measures		Categories of the degree of change brought about by activities: Review existing operations	Categories of the degree of change brought about by activities: New measures to innovate current operations
Reduce Dependence and Impact	**Avoid**	Avoid the use of resources that are unnecessary or excessive by operational changes	Avoid using high-impact resources by substituting low-impact resources
	Efficiency	Reduce the use of resources that are unnecessary or excessive by to operational changes	Innovating existing operations and optimizing productivity with introduction of new technologies, etc.,
	Reuse	Reuse resources which were previously disposed of in existing operations	By recycling waste, significantly reducing input of virgin materials
	Regenerate	Recover resources equivalent to what one have used	Accelerate nature recovery using new technology recovery and recover more than one have used
Support above action by Capital Acquisition and Circulation	**Human resources**	Recruit or train knowledgeable personnel	Substantially improve the speed of knowledge acquisition using technology and other measures
	Finance	Focus on IR, etc. and raise funds advantageously	Obtain both supply chain stabilization and financial profits through in-house investment
	Information	Centralize risk information	Rennovate planning, procurement and disclosure by utilizing risk information. Significant reduce in risk by improving prediction accuracy
	Network	Partner with existing suppliers,Enhance communication with other stakeholders	Become network hub service provider in the industry
Purpose of business action		**All businesses should be tackled first**	**For greater impact/growth in sales, One needs to take mid term action**

New business opportunities

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Business areas for “Dependency and Impact reduction"

10 business area exists as examples that avoid, streamline, reuse, and recover resources.

Types of nature risk measures

Examples of new business opportunities

	Avoid	Effici-ency	Reuse	Regen-erate	Area	Examples of reducing impact to nature
Reduce dependency and impact		●	●		**Retrofit Resource-saving Hardware**	Reuse of water and insulation hardware that to contribute to efficiency and reuse of resources
		●			**Factory And Warehouse Robots**	Increase productivity through picking/serving/cleaning robots, realizing efficient use of resources
		●			**Agricultural Robots**	Increase agricultural productivity through harvesting robots, drones, plant factories, etc., realizing efficient use of resources
	●				**Electric Vehicles**	Avoid GHG emissions and water use through electric vehicles/ships/trains
	●	●	●	●	**Consumer Alternative Products**	Reduce impact on nature by manufacturing products using new materials to innovate resource use (Plant-derived products, water-saving products, alternative containers, etc.)
	●	●	●	●	**Industrial Alternative Materials**	Reduce impact on nature by manufacturing products using new materials (Plant-based paints, NOx/SOx non-emitting cement, raw materials for low-impact farming) that innovate resource use
	●	●			**Low-resource Pesticides And Fertilizers**	Reduce the impact on nature by introducing new materials (Microbially derived nitrogen fertilizers, bio-insecticides, etc.) that innovate the use of resources
	●	●			**Renewable Energy And Nuclear Fusion Facilities**	Avoid or reduce the generation of GHG through fusion power plants, geothermal power plants, etc.
			●		**Raw Material Reuse Technology**	Reuse resources through the decomposition of plastics and fibers and the recovery of waste metals, etc.
		●	●		**Energy Reuse Technology**	Reduce the reuse of resources and the use of new resources through waste heat recovery technology, etc.

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Business areas for “capital acquisition and circulation”

7 business areas exist as examples of areas that use new technologies to acquire capital to support efforts to reduce nature impact.

	Types of nature risk measures				Examples of new business opportunities		Examples of Supported Dependence and Impact Classification			
	Human Resource	Finance	Inform-ation	Network	Area	Examples of reducing impact to nature	Avoid	Effici-ency	Reuse	Rege-nerate
Capturing and circulating capital to support activities			●		**Iot Productivity/Anomaly Monitoring**	Production optimization based on market data, fertilizer optimization by acquiring soil and weather information, and reduction of resource use by disaster detection, etc.	●	●		
		●		●	**Sustainable Supply Chain Finance**	Financial support favoring activities to reduce the impact on nature, thereby helping to reduce the impact on the entire supply chain	●	●	●	●
			●		**Integrated Control Of Distributed Renewable Energy**	Integrated management of a wide range of power generation information helps to expand the use of renewable energy	●	●		
				●	**Agricultural Products Platform Product/Trade/ Logistics**	By matching the trade of farm products widely in real time, it contributes to reduce stock retention periods and surplus stocks.		●	●	●
				●	**Manufacture Outsourcing Network**	Efficient use of natural resource by connecting with manufacturing contractors with lower environmental impact	●	●	●	●
			●		**Customized Marketing Platform**	Obtain customer information related to environmental awareness by visualization of customer trends and feedback	●			
		●	●		**ESG Information Visualization/Disclosure Platform**	Identify hot spots through visualization of environmental and social impacts on supply chains such as GHG emissions	●	●	●	●

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Examining the priority of the area

Actions for biodiversity need to be reviewed on the two dimensions, "benefit for nature" and "benefit for company" and to verify their effectiveness and significance.

Perspective	Question to ask	Examples of Evaluation Indicators	
Potential contribution to Nature + **Potential contribution to the company**	How much impact towards nature can we reduce?	**Characteristic of measures**	Measures to reduce environmental impact realized by measures (AR^3T *)
		Effect of measures	Amount of reduction in environmental impact per measure implemented
		Scope of application of measures	Amount of coverage for which measures can be implemented (area, mass, etc.)
	Are there any benefits in business?	**Sales growth**	Future market size for which measures can be approached
		Cost avoidance	Additional costs prevented by measures
		Increase in enterprise value	Improved internal valuation, brand and stock prices through measures

Evaluation by below aspects in next page
Nature Perspective: "environmental impact's Reduction Effect"
Company's Perspective: "Size of the Potential Market"

*SBT for Nature defines priorities for methods to reduce environmental impacts in the order of Avoid, Reduce, Reuse and Restore

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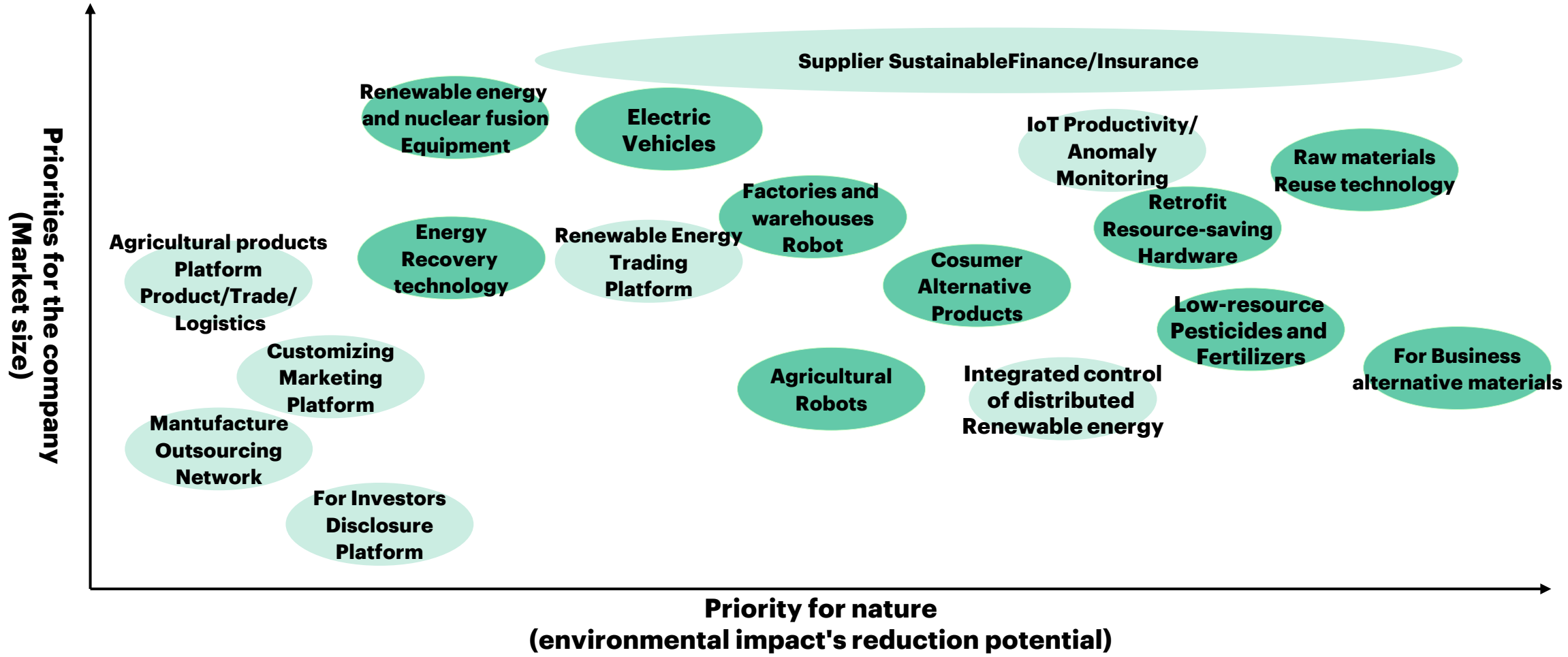
Reduce Dependence and Impact

Support above action by Capital Acquisition and Circulation

Evaluation of possible Nature-related Opportunities

"Supplier financing" and "raw material reuse technology" are found to be business opportunities with high contributions to both nature and the company.



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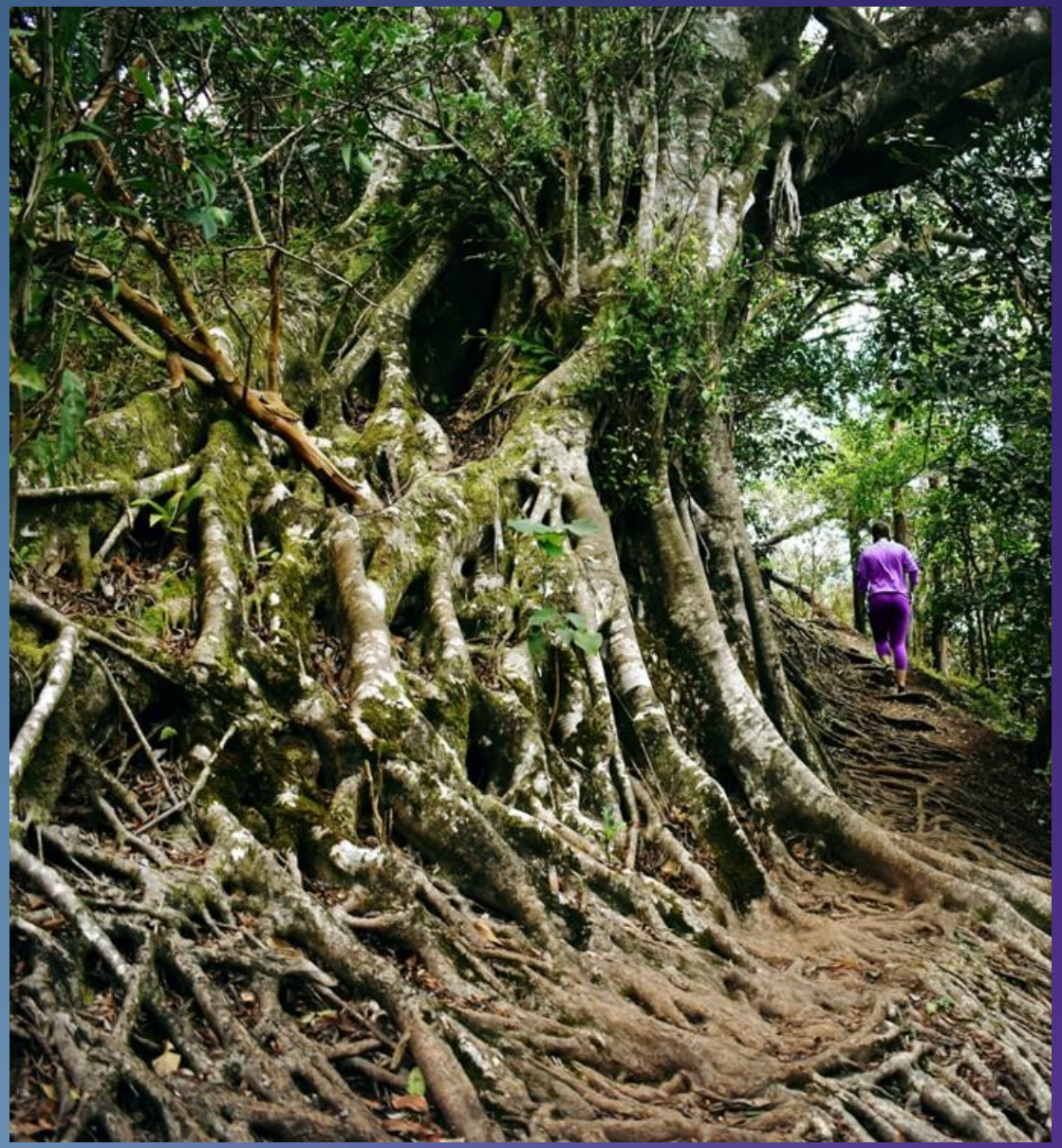
Final Chapter



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The enter point of Biodiversity actions

- The world has now entered the first phase to analyze the relation between business and nature. Human is unable to clarify how complicated nature system functions and there are still many to discuss. Nevertheless, it is clear that business activities are greatly involved in the causes of biodiversity loss, which is happening rapidly.

- At the same time, there is no doubt that it will be impossible to continue business as we do now in a world where biodiversity has been lost. Based on the biodiversity degradation that is already taking place, this survey has clarified that there will be a large impact in the future, whether international society chooses to make efforts toward preservation or does not take effective action

- It is very difficult to find out appropriate measures for these impacts, but we would like to emphasis that the first step must be, to understand the contact points and dependence/impact on nature in one’s own businesses, as we have conducted in this research

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Appendix

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Glossary of key terms

- **Biodiversity**
  The variability among living organisms from all sources, including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems.
- **Dependency**
  Aspects of ecosystem services that an organisation or other actor relies on to function. Dependencies include ecosystems' ability to regulate water flow, water quality, and hazards like fires and floods; provide a suitable habitat for pollinators (who in turn provide a service directly to economies), and sequester carbon (in terrestrial, freshwater and marine realms).
- **Impact**
  Changes in the state of nature, which may result in changes to the capacity of nature to provide social and economic functions. Impacts can be positive or negative. They can be the result of an organisation's or another party's actions and can be direct, indirect or cumulative.
- **Natural Capital**
  The stock of renewable and non-renewable natural resources (e.g. plants, animals, air, water, soils, minerals) that combine to yield a flow of benefits to people.
- **Nature**
  The natural world, with an emphasis on the diversity of living organisms (including people) and their interactions among themselves and with their environment.
- **Nature loss**
  The loss and/or decline of the state of nature. This includes, but is not limited to, the reduction of any aspect of biological diversity e.g. diversity at the genetic, species and ecosystem levels in a particular area through death (including extinction), destruction or manual removal.
- **Nature-related Opportunities**
  Activities that create positive outcomes for organisations and nature by creating positive impact on nature or mitigating negative impacts on nature.
- **Nature-related Risks**
  Potential threats posed to an organisation linked to their and wider society's dependencies on nature and nature impacts. These can derive from physical, transition and systemic risks.
- **Physical Risk**
  Risks arising when natural systems are compromised, due to the impact of climatic (i.e. extremes of weather) or geologic (i.e. seismic) events or changes in ecosystem equilibria, such as soil quality or marine ecology.76 These can be event driven (acute), chronic, or both.
- **Transition risks**
  Risks that result from a misalignment between an organisation's or investor's strategy and management and the changing regulatory and policy landscape in which it operates. Developments aimed at halting or reversing the damage to nature, such as government measures, technological breakthroughs, market changes, litigation and changing consumer preferences can all impact risks.

Above Key terms are from TNFD guidance[13]

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References

1. Taskforce on Nature-related Financial Disclosures. 2022. *The TNFD Nature-related Risk & Opportunity Management and Disclosure Framework: Beta v0.3*.
2. Kao Corporation. *Kao | ESG Report Hub*[website]. https://www.kao.com/global/en/sustainability/pdf/ (accessed 24 March 2023)
3. Taskforce on Nature-related Financial Disclosures. 2022. *The TNFD's proposed approach to scenario analysis (Discussion paper A) November 2022*
4. O'Neill, Brian & Kriegler, Elmar & Ebi, Kristie & Kemp-Benedict, Eric & Riahi, Keywan & Rothman, Dale & van Ruijven, Bas & Vuuren, Detlef & Birkmann, Joern & Kok, Kasper & Levy, Marc & Solecki, William. 2015. *The roads ahead: Narratives for shared socioeconomic pathways describing world futures in the 21st century. Global Environmental Change*. 42. 10.1016/j.gloenvcha.2015.01.004.
5. Hofste, R., S. Kuzma, S. Walker, E.H. Sutanudjaja, et. al. 2019. *"Aqueduct 3.0: Updated Decision Relevant Global Water Risk Indicators." Technical Note*. Washington, DC: World Resources Institute. Available online at: https://www.wri.org/publication/aqueduct-30. Natural History Museum
6. Helen Phillips; Adriana De Palma; Ricardo E Gonzalez; Sara Contu et al. 2021. *The Biodiversity Intactness Index - country, region and global-level summaries for the year 1970 to 2050 under various scenarios [Data set]. Natural History Museum*. https://doi.org/10.5519/he1eqmg1
7. FAO. 2018. *Global Soil Organic Carbon Map* (GSOCmap)
8. Kao Corporation. *Kao Develops Bio IOS, to Completely Transform the Concept of Conventional Detergent Bases* [website]. https://www.kao.com/global/en/news/rd/2019/20190123-001/ (accessed 24 March 2023)
9. Kao Corporation. *Highly durable asphalt modifier made from waste PET NEWTLAC 5000*[website]. https://chemical.kao.com/global/infrastructure/product/newtlac/(accessed 24 March 2023)
10. Kao Corporation. *The Kao Group's Largest Photovoltaic Power Generating Facility, with a Power Generation Capacity of 2.8 MW, Begins Operation at Sakata Plant in Japan*[website]. https://www.kao.com/global/en/news/sustainability/2021/20210708-001/(accessed 24 March 2023)
11. Kao Corporation. *Tochigi Plant and Toyohashi Plant have started Photovoltaic power generation*[website]. https://www.kao.com/global/en/news/sustainability/2019/20190401-002/ (accessed 24 March 2023)
12. Kao Corporation. *Initiative to Ensure Stable Product Supply and Reduce Environmental Impact by Adopting a Regular Shipping Route with RORO Ships from Wakayama Shimotsu Port*[website]. https://www.kao.com/global/en/news/business-finance/2022/20221206-001/ (accessed 24 March 2023)
13. Taskforce on Nature-related Financial Disclosures. 2022. The TNFD Nature-Related Risk and Opportunity Management and Disclosure Framework Beta v0.1. (Annex 1 –Glossary of key terms)

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About Kao Corporation

Since its founding in 1897, Kao has been providing consumer products that support clean, comfortable and healthy daily life, as well as high-quality chemical products with environmentally friendly functions and performance, with the mission to contribute to people's lifestyle and culture and social sustainability.

In 2018, Kao declared that ESG should be at the core of its business, and in 2019, announced the new ESG strategy, the Kirei Lifestyle Plan.

With the corporate message of "Kirei-Making Life Beautiful," Kao will continue to contribute to the enrichment of people, society, and the planet, through "ESG-driven *Yoki-Monozukuri*" - now and in the future.

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