

# Biodiversity

Our business is made possible throughout the entire product lifecycle by the various ecological systems that exist on the planet and the abundant natural bounty created from biodiversity.

Kao is diligent in procuring sustainable raw materials and developing new technologies in order to use limited resources effectively. This is to help prevent the degradation of biodiversity, one of the most pressing issues facing the entire world. We also strive to minimize the impacts of our business activities on biodiversity and to promote social activities that lead to biodiversity improvements in regions where we have business sites.

In addition, we support the recovery of already polluted ecological environments by tackling issues such as ocean plastic pollution. Kao will help to conserve and restore biodiversity and regenerate the natural environment by promoting engagement with consumers, suppliers, and other stakeholders and by providing suitable products and solutions.

## Social issues

Global Biodiversity Outlook 5 (GBO5) was published by the Secretariat of the Convention on Biological Diversity on September 15, 2020 to analyze whether the Strategic Plan for Biodiversity 2011–2020 and Aichi Biodiversity Targets are being met. Although significant progress was seen for most of the Aichi Biodiversity Targets, it showed that none of the 20 individual targets had been fully realized.

An aspect of current economic activities is that they rely on the consumption of precious natural capital. In addition, humanity's destruction of nature and biodiversity are leading people to come into contact with species that they never had before, which manifests the risk of new infectious diseases. Businesses are required to solve these problems.

Also, now it is universally recognized that biodiversity and climate change are closely related issues and they must be resolved simultaneously.

The World Economic Forum's 2022 report on serious global risks for the next decade also ranked biodiversity issues third, behind the failure to address climate change and extreme weather events.

In light of these circumstances and a review of the past, the Kunming-Montreal Global Biodiversity Framework, a new global goal by 2030, was decided at the 15th meeting of the Conference of the Parties (COP15) to the United Nations Convention on Biological Diversity in December 2022.

We consider the 2050 Vision, which aims for a society in harmony with nature, to be unique compared to the previous Aichi Targets in that it incorporates a number of numerical targets and sets goals that society as a whole, including businesses and consumers, should work toward. It is also worth noting that companies are encouraged to assess and disclose information on biodiversity, and that a section on protecting the rights of indigenous peoples, women, and youth has been added to biodiversity-related decision-making.

As a member of international society, we are keenly aware of the need to take action for the conservation and restoration of biodiversity and the regeneration of the natural environment with a strong sense of crisis, acknowledging that the targets set here must be met.

Our business operations benefit from many biological resources, ranging from procurement of raw materials such as palm oil, to Research and Development, manufacturing, use, and post-use disposal. The degradation of biodiversity worldwide will significantly impact the development and sustainability of our business. In Research and Development, there are technologies that have been developed by applying hints from the wisdom of nature and living things, and we consider this to be a benefit of biodiversity as well. Moreover, many of the products that we manufacture and sell are discharged into the environment along with water after use and are eventually purified by natural forces. Yet packaging containers, typically plastic, are

sometimes disposed of improperly, polluting the environment. Accordingly, we are well aware that we need to take biodiversity into account throughout the product lifecycle.

Establishing a process for sustainable procurement of raw materials is also crucial. However, in purchasing RSPO-certified sustainable palm oil, we have been facing various issues over the last ten years in oil palm production regions, including deforestation and the loss of biodiversity as well as human rights violations of people and farmworkers who live there. By taking full advantage of our knowledge and human networks acquired so far, we aim for a future that brings about a positive change for the entire natural environment and all stakeholders connected with our business.

## Policies

Efforts are now underway around the world to reduce negative impacts on nature and biodiversity, increase behavior that has positive impacts, and reverse biodiversity loss to achieve recovery.

The Kunming-Montreal Global Biodiversity Framework includes "a society living in harmony with nature" as its vision for 2050. This vision is exactly the same as the mission of the Kao Way: "To realize a Kirei world in which all life lives in harmony."

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The “Basic Policies on Biodiversity” revised in April 2022, prior to COP15 in December 2022, set forth eight policies as well as the direction to aim for.

In other words, we will live each day in spirit and make thoughtful choices for the benefit of society, thereby ensuring a healthy planet for the future. We aim to realize such a lifestyle (Kirei Lifestyle), to minimize our dependence and impact on nature and biodiversity, and to maximize their blessings to make their full value available to people, society, and the planet, and to conserve and restore the biodiversity that is currently being lost, leading to the regeneration of nature. We will promote activities based on the following policies:

- Grasp the relationship between our business and biodiversity throughout the value chain
- Minimize the impact on biodiversity
- Promote and implement proprietary technology development
- Comply with international agreements
- Conduct business activities that do not damage local ecosystems
- Maximize the impact of collaboration by raising awareness and sharing information among internal and external stakeholders
- Collaborate with external parties to take action to conserve and restore biodiversity and guide nature towards regeneration
- Seek a symbiosis between people, nature, and chemistry

Taking advantage of the opportunity provided by the revision of the Basic Policy on Biodiversity, we will continue the Activities for Biodiversity Conservation that we have been carrying out, and at the same time, we will raise the level of existing activities and carry out new ones as well.



**Basic Policy on Biodiversity**  
<https://www.kao.com/content/dam/sites/kao/www-kao-com/global/en/sustainability/pdf/biodiversity-basic-policy.pdf>

**Action Policies on Conservation of Biodiversity**  
<https://www.kao.com/content/dam/sites/kao/www-kao-com/global/en/sustainability/pdf/biodiversity-action-policy.pdf>

## Strategy

### Risks and opportunities

#### Risks

Key raw materials that we use include palm (kernel) oil, paper and pulp. Palm (kernel) oil is transformed into a surfactant and mixed into many detergents that we manufacture and sell, including shampoo and body soap. Also, pulp is a crucial raw material used in hygiene products (such as diapers and sanitary napkins), one of our leading product categories.

Future global-scale population growth and economic development may increase demand for detergents and hygiene products, resulting in even further growth in demand for palm oils, paper, and pulp—the main raw materials we need.

Procurement of sustainable raw materials that take biodiversity, human rights violations and other issues into account may give rise to additional costs. However, if we do not consider sustainability in procurement, the inability to procure raw materials over the long term or the substantial impairment of the company’s reputation may call our business survival into question.

In addition, if we maintain a linear economy in which products (including their packaging) are consumed without being recycled or reused, resources will be further consumed and flow into the environment, resulting in increased damage to biodiversity. We need

shift to a resource circular economy and provide products with even greater added value that use fewer resources.

### Opportunities

We established the Basic Policies on Conservation of Biodiversity in 2011 and have been developing new technologies that can contribute to sustainable raw material procurement and the conservation of biodiversity. Then, in April 2022, we revised our Basic Policy on Biodiversity and decided to move from biodiversity conservation to restoration and regeneration through realizing the Kirei Lifestyle. We believe that by practicing KLP and conducting activities in line with the Basic Policy on Biodiversity, we can minimize the loss of nature and biodiversity and the business risks associated with it, and furthermore, the products, technologies, and various activities born from these activities will lead to new business opportunities.

For example, the ESG Promotion Activities with Suppliers, which were revised in June 2021, set targets for confirming zero deforestation in places of origin for palm oil, paper, and pulp, and we are increasing the likelihood of business continuity by taking specific initiatives with suppliers to achieve sustainable raw material procurement in the future.

In addition, Bio IOS, a surfactant that we developed, is a completely new surfactant that utilizes solid fats and oils unsuitable for food. It avoids the issue of competition with food, a concern that aligns with the growing global population. Applications of this technology are expected to expand into solutions for various problems such as the shortage of raw materials. *Attack ZERO*, which contains Bio IOS, is a water-saving liquid laundry detergent that reduces the amount of water used for rinsing, which we believe will help

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conserve precious water resources not only in regions with relatively abundant water, but also in places at risk of drought.

## Strategy

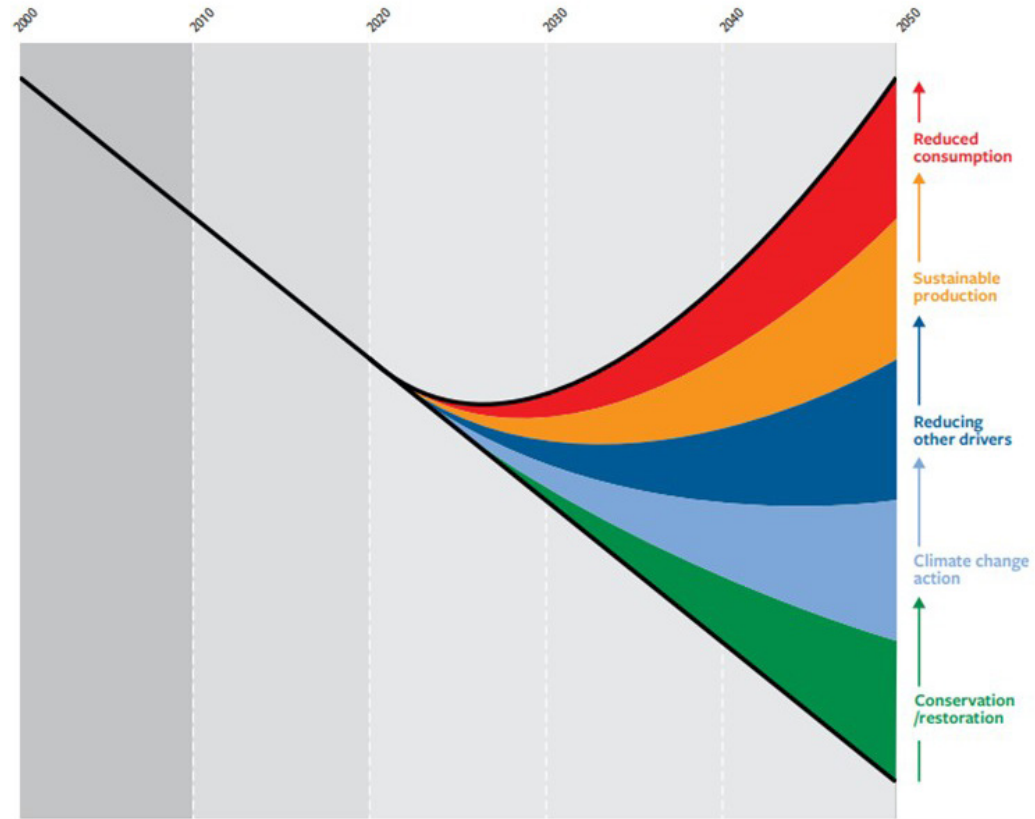
The world has now set the following three time-bound goals, with 2020 as the baseline, to become Nature Positive in 2050.

- In 2020, start activities to achieve the goal of plus-minus zero.
- By 2030, ensure that positive impacts outweigh negative ones.
- By 2050, restore nature to a sustainable state.

Kao's activities to Nature Positive reference the portfolio of actions to reduce loss and restore biodiversity as outlined in the Global Biodiversity Outlook 5.

It states that the recovery of biodiversity can be expected through all the combinations of enhanced conservation and restoration of ecosystems, mitigation of climate change, action on pollution, invasive alien species and overfishing, sustainable production, and reduction of consumption and waste. We believe these activities are relevant to the KLP's Water Conservation, Decarbonization, Air & Water Pollution Prevention, Responsibly Sourced Raw Materials and Zero Waste. In other words, we believe that the promotion of KLPs related to biodiversity itself leads to actions that reduce and restore biodiversity loss. We will also continue the biodiversity conservation activities we have been engaged in with our business sites and local communities.

**A portfolio of actions to reduce loss and restore biodiversity**



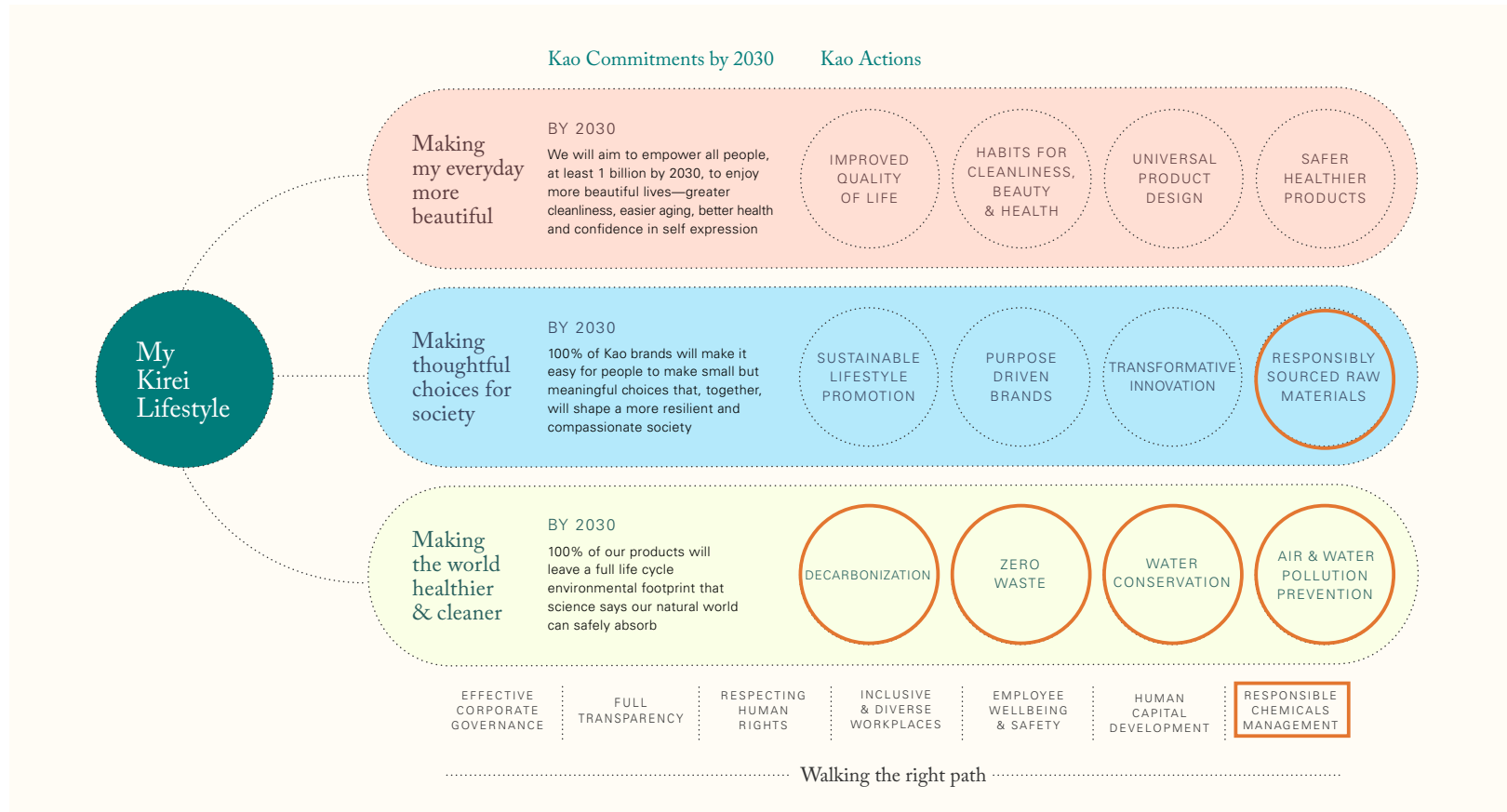
Source: Global Biodiversity Outlook 5 (March 2021, Secretariat of the Convention on Biological Diversity)  
<https://www.cbd.int/gbo/gbo5/publication/gbo-5-en.pdf>

Biodiversity trends (various indicators, left axis) are declining and projected to keep falling under the “business-as-usual” scenario (trend line). A number of areas for action can slow the rate of biodiversity loss, and a full portfolio of actions combined could halt and reverse the decline (turn the tide) and lead to a net increase in biodiversity after 2030. These are, from bottom to top: (1) better conservation and restoration of ecosystems; (2) mitigation of climate change; (3) combating pollution, invasive alien species and overfishing; (4) more sustainable production of goods and services, especially food; and (5) reduction of consumption and waste. However, none of the action areas, alone or in partial combination, can reverse the tide of biodiversity loss. In addition, the effectiveness of each area of action is reinforced by the others (see Part III of the main body of the report for discussion).

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Palm substitution technologies, such as those described below, not only contribute to waste reduction and sustainable production, but can also have an even greater positive impact if they are widely adopted around the world.

## Kirei Lifestyle Plan and Biodiversity



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## Social impact

IPBES\* believes that transformative change in economies, society, politics, and science and technology will be necessary in order to achieve the biodiversity targets. We set targets based on visions and policies specified by ESG-driven management, and push forward toward the prevention and restoration of the degradation of biodiversity and the development of a sustainable society in the future through our innovative technologies, products, and daily initiatives to solve social problems.

\* IPBES  
Intergovernmental science-policy platform on biodiversity and ecological system services

These various processes intended to achieve the 2025 targets relating to sustainable raw-material procurement will restore and recover forest environments at raw-material procurement sites, and lead to improved respect for the human rights of local communities that use those environments.

Forests stabilize global temperatures and climate, and play the role of breakwater systems to prevent disasters because they retain water. Various resources and bounties essential for our everyday lives, such as food, medicine, clean water and air, come from ecosystems and are estimated to have an economic value worth thousands of trillions of yen.

Companies developing and selling products that take biodiversity into consideration, from raw-material procurement to after the product is used, and consumers choosing such products, will bring about a society that better understands the biodiversity within many peoples' daily lives and can help directly and indirectly to restore and regenerate the biodiversity of

the natural environment. If we can use resources at a sustainable level considering the productivity of bio organisms, we will be able to keep using nature's bounty and sustain an enriched lifestyle.

## Contributions to the SDGs



## Business impact

Considerable costs are involved in procuring sustainable raw materials, but we consider these activities an indispensable investment to make our business sustainable and a part of our social responsibility.

As the trend toward ethical consumption is gaining traction in the European and American markets, as well as among Millennials and Generation Z, demand is growing for products using sustainable raw materials that take biodiversity into account. Our presence on the rapidly expanding ethical consumption market is enhanced through the incorporation of a biodiversity approach in the products we offer from the raw material procurement to the product design and development, usage and disposal.

We expect the results of these activities not only to boost our reputation substantially, but also to be of financial and non-financial benefit.

## Governance

### Framework

The loss of biodiversity is one of the major social problems surrounding our company. Among the 19 actions established in the Kirei Lifestyle Plan (KLP), measures such as responsibly sourced raw materials, decarbonization, zero waste (plastic reduction, etc.), air & water pollution prevention, and responsible chemicals management are closely related to biodiversity.

Forests are a source of key raw materials for Kao, and are of course important in terms of sustainable raw material procurement (related to the KLP action responsibly sourced raw materials). Forests are also habitats for diverse organisms, places to store water, and sinks for carbon dioxide, which is a cause of global warming. Preventing the destruction of peatlands, which are sites for storing carbon, along with forests is vital not only from the viewpoint of business continuity, but also the perspectives of biodiversity and global warming control (related to the KLP action of decarbonization).

Moreover, we will take action to prevent air and water pollution from exhaust and wastewater emissions during manufacturing processes. This will be done to minimize the environmental impact of constituent materials and other substances discharged into the environment along with water after product use (related to KLP actions air & water pollution prevention and responsible chemicals management), and reduce the impact that residual plastic packaging in the environment resulting from improper processing can have on biological and ecological system.

Biodiversity involves complex factors that are intertwined, and it is not desirable for any of these activities to be missing or for one activity to have a

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negative impact on another. For this reason, it is necessary to organize these activities in an integrated manner from the perspective of biodiversity.

To ensure that actions are quickly taken as priority issues, ESG Steering Committees were setup for the first time in 2022 in four key areas. Under the committee owners, who are executive officers, the steering committees coordinate with the ESG Managing Committee and have the ability to make suggestions to each division and group company. In particular, issues related to decarbonization, plastic packaging, and chemical management are all relevant biodiversity topics.

The SAICM Promotion Meeting, a subordinate body of the Chemicals Management Committee, has been promoting discussions on the relationship between chemicals and biodiversity at three of its four meetings a year.

In 2022, from February to April, the ESG Managing Committee discussed and approved the revision of the Basic Biodiversity Policy after preliminary discussions at the ESG Promotion Meeting. The Basic Policy on Biodiversity was released externally in May.

We define conservation of biodiversity as one element of environmental conservation, which is a part of the Responsible Care (RC) activities. We establish policies, targets and plans relating to biodiversity and manage them along with the progress of measures under the RC promotion framework. Regarding the progress of activities, the RC Promotion Committee, the Japan RC Meeting, and the Global RC Meeting (all of which are attended by the director in charge) are held once a year. Information was shared as appropriate at the above meetings (in 2022, the meetings were held in Japan as a hybrid of online and face-to-face meetings, and in several areas outside Japan through online meetings).

**P18** Our ESG Vision and Strategy > Governance

**P285** Responsible Care Activities > Governance

## Education and promotion

After formulating the Basic Policies on Conservation of Biodiversity in 2011, we took other initiatives to provide basic knowledge about biodiversity to employees by such means as e-learning courses for all employees of the Kao Group in Japan and annual environmental training for new employees. In 2022, as in the previous year, we created opportunities to learn about the latest global trends regarding biodiversity and how they relate to our business activities, primarily through training sessions for *Genba* leaders in the Supply Chain Management (SCM) (with participants from within and outside Japan) and follow-up training sessions for new employees. For employees outside Japan, we are conducting information sharing and awareness-raising activities through such venues as the annual Global RC Meeting.

We also view interactions not only within the company but also with other companies and investors as important learning opportunities. For example, we have exchanged views with several companies and taken the opportunity at various meetings organized by Japan Business Initiative for Biodiversity (JBIB) to present Kao's biodiversity activities, and receive opinions and advice from external experts and other companies working together on biodiversity issues.

## Collaboration with stakeholders

In June 2022 we reorganized our procurement policies and guidelines. In other words, we have reorganized and reviewed the contents of our "Partnership Requirements for Suppliers," "ESG Promotion Activities with Suppliers," and "High-Risk Supply Chain Management and Sourcing" under the Policies for Procurement. We collaborate with suppliers to contribute to ensuring traceability throughout the entire supply chain and solving social issues such as resource and environmental conservation, safety and human rights issues. In addition to complying with laws and regulations, we require our suppliers to consider social responsibility and the environment, and we prioritize procurement from suppliers who comply. Consideration for social responsibility and the environment includes issues that are deeply related to biodiversity, such as forest and water conservation.



Policies for Procurement  
<https://www.kao.com/content/dam/sites/kao/www-kao-com/global/en/sustainability/pdf/procurement-policy.pdf>

We consider biodiversity conservation and support zero deforestation when procuring raw materials including palm oil, palm kernel oil, paper, and pulp. We continue to procure palm oil and palm kernel oil, all of which can be traced back to their production area, and to only purchase pulp for which its wood material can be traced back to its production area.

We seek to create a sustainable supply chain for palm oil, and to improve and sustain the productivity of oil palm smallholders in Indonesia. We promote the Smallholder Inclusion for better Livelihood & Empowerment program, which seeks to obtain certification for sustainable palm oil.

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## **P91** Responsibly Sourced Raw Materials



Progress of the SMILE project and commencement of the grievance mechanism  
<https://www.kao.com/global/en/newsroom/news/release/2022/20220413-001/>  
<https://www.kao.com/global/en/newsroom/news/release/2022/20220831-001/>

The Kao Group has business sites around the world. Basic policies on biodiversity conservation are formulated by the Head Office in Japan, but the status of and approaches to biodiversity vary in different countries and regions. We believe that creating opportunities for the active exchange of opinions with various relevant stakeholders in each country and region including governmental agencies, NGOs, NPOs and experts can facilitate the effective implementation of biodiversity conservation activities, and make recommendations to the responsible personnel in each country and area.

We undertake green space conservation activities at each business site in consideration of biodiversity, and arrange events in which employees can participate. We also encourage employees to volunteer for outdoor biodiversity conservation programs. What is more, Kao aspires to deepen understanding of biodiversity among all employees through their active participation in these activities.

At the Eco-Lab Museum at our Wakayama Plant, where the global environment and Kao's ecology technologies are on display, we run community-based awareness-raising activities for elementary school students who will build the future. At the combined greenhouse facilities, the hot and humid climate of

southern countries where palm trees grow is recreated and approximately 60 species of plants can be seen.

## Risk management

Among raw materials procured by Kao, palm oil and paper/pulp are identified as "high-risk supply chains" as supply chains with significant issues from the perspectives of business (purchase amount, etc.), ESG (biodiversity, etc.) and area (protected areas, human rights issues, etc.), and we are working on sustainable procurement based on "High-Risk" Supply Chain Management and Sourcing. We aim for zero deforestation at the source. We support the NDPE\*1 and ask suppliers and supplier group companies to comply with the NDPE policy and HCSA\*2. Through *Genba* dialogue, we will identify risks, determine the nature of the issues, work with suppliers and NGOs to resolve them, and disclose progress. This activity is related to "responsibly sourced raw materials" in the KLP. Procurement takes the lead in this activity and reports to the Directors through the Management Board.

\*1 NDPE:  
No Deforestation, No Peat and No Exploitation  
 \*2 HCSA:  
High Carbon Stock Approach

## **P91** Responsibly Sourced Raw Materials

## Targets and metrics

### Mid- to long-term targets and 2022 results

The Kao Way, our corporate philosophy, states that our mission is to create a Kirei life for all, providing care and enrichment for the life of all people and the planet. From the perspective of biodiversity, we believe that caring for all people and the planet means maximizing the value to people, society and the planet by minimizing reliance and impacts on nature without exceeding the capacity of natural production and regeneration.

### **Development of a society that can continue to enjoy the benefits of biodiversity**

With regard to palm oil, paper, and pulp, which are our main raw materials, we set targets to confirm that there is no deforestation in the places of origin and ensure traceability. We are carrying out specific measures to achieve those targets such as mapping deforestation risks and investigating plants judged as posing high risks. In 2020, we completed the confirmation of traceability back to large plantations, and our object by 2025 is to complete the confirmation of traceability to oil palm smallholders.

We believe that expanding sustainable production of raw materials and establishing procurement systems that do not involve deforestation or human rights violations will help to form a sustainable society that permanently maintains the benefits of biodiversity for all stakeholders.

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## Minimizing the impact of products on biodiversity

We seek to minimize the impacts on biodiversity in all processes of our business activities including the impact on the environment from the procurement and use of raw materials, product development, and disposal.

Palm (kernel) oil is used in many of Kao's products, and the demand is expected to increase due to global population growth. As such, there are concerns about deforestation and raw-material shortages. Kao therefore continues to develop technologies to use natural, inedible sources of fats and oils as an alternative to palm (kernel) oil. Kao has already developed Bio IOS, a surfactant that can be used as a surfactant from oil and fat materials, which have been difficult to utilize in the past, and is being applied in laundry detergents. In 2022 we initiated an experimental study to produce bio-based nonionic surfactant from non-edible biomass using cassava residue, a biomass waste product. We are also working on the development of microalgae that can produce oil and fat materials with a high degree of efficiency.

In addition, we are working to minimize the quantitative and qualitative impacts of components discharged into the environment along with water after product use, and to solve the problems of plastic packaging that have already been discarded, as well as ocean plastic pollution.

## Assessing impact on biodiversity throughout the value chain

In 2021, we used Exploring Natural Capital Opportunities, Risks and Exposure (ENCORE), a risk assessment tool released under the guidance of the Natural Capital Finance Alliance (NCFA), an international financial industry organization active in the field of natural capital, to identify dependencies on natural capital and impact factors within the company. Among the identified factors were items for which uniform international assessment methods have not been established, and it will take a little more time to perform an overall evaluation with a certain degree of quantitiveness. However, the qualitative indication of notable natural capital and hotspots in our value chain has made it easier to prioritize our activities.

This year, using Kao's flagship product, a detergent, as an example, we identified hot spots in the value chain by benchmarking other companies and conducting additional research using various guidelines and reports, as well as using Geographic Information System tools (GIS).

## Mainstreaming biodiversity

Promoting the procurement and consumption of sustainable palm oil through Japan Sustainable Palm Oil Network to collaborate with other companies and various other measures such as encouraging employees to participate in business site green space conservation activities and outside biodiversity conservation activities contribute to mainstreaming biodiversity.

We also participate in Japan Business Initiative for Biodiversity (JBIB) and the working group for the post-2020 biodiversity framework in Keidanren (Japan Business Federation) to understand the latest

international trends and collaborate and share information with other companies.

There is also a growing movement to disclose how changes in the natural environment and biodiversity affect corporate performance. From April 2022, we are participating in the TNFD\* forum to gather information and provide feedback for the beta version to be released by TNFD. Since TNFD is developing the framework in an open innovation manner, active feedback from companies that are disclosing entities may make the framework easier to use and more suited to actual conditions. We have also joined the TNFD Consulting Group (TNFD Japan Council) to gather information and exchange opinions with companies in Japan. The knowledge gained is shared with the relevant departments within the company, and we strive to be among the first to engage in activities tailored to the global level.

\* TNFD: Taskforce on Nature-related Financial Disclosures

## 2022 results

### **A new attempt** **Identification of Kao material issues relating to biodiversity**

In 2021, we used ENCORE, a risk assessment tool, to identify dependencies on natural capital and impact factors within our company.

In our business activities, we use palm (kernel) oil and pulp as raw materials, and surfactants derived from palm oil are formulated into cleansing products. Also, after products are used, they are discharged into the environment along with used water, and some packaging is improperly disposed of and also released into the environment. As a result of this, ENCORE identified factors arising from the use of palm and pulp,



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the impact on ecological system after products are discarded, greenhouse gases, waste and so on.

In 2022, we analyzed the entire value chain, using Kao's flagship product, detergents, as an example, in line with the LEAP approach of the TNFD. We identified critical issues upstream, direct operations, and downstream respectively, and identified materialities for each critical issue using a combination of various tools.

## Results of ongoing activities

### 1. Promote procurement of sustainable raw materials

Traceability checks are underway for the procurement of palm oil, palm kernel oil, paper and pulp.

In addition, we are continuing activities to increase the procurement ratio of RSPO-certified oil and to support small-scale palm plantations in obtaining RSPO certification.

### 2. Promote business and social contribution activities that consider local biodiversity

While activities were unavoidably limited due to the spread of the COVID-19 pandemic that has been ongoing since 2020, we conducted many activities that were possible within these constraints.

### 3. Reduce use of copy paper

The number of copies printed per capita in Japan was 93.6% of the previous year's level, achieving the target (below the previous year's level).

### 4. Green Purchasing

The green purchasing rate in Japan was 93.0%.

## Targets for 2023

Annual targets relating to biodiversity are set and managed each year within the RC targets managed through PDCA on a one-year activity unit basis. The 2023 targets are as follows.

### 1. Promote procurement of sustainable raw materials

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### 2. Promote business and social contribution activities that consider local biodiversity

Based on the results of the biodiversity surveys of all Kao Group production sites conducted in 2018 and 2019, each site individually plans feasible biodiversity conservation activities in line with actual conditions.

### 3. Reduce use of copy paper

As an activity that all employees can participate in, we have started reducing the use of copy paper at the Kao Group in Japan. From 2021 onwards, our objectives are to promote this activity globally and print less pages per person than the previous year.

### 4. Green Purchasing

We are promoting green purchasing, which places priority on purchasing products with the least possible environmental impact. We have been taking action in this area based on Act on Promoting Green Purchasing. We have set our 2023 target green purchasing rate in Japan at 100%.

## Reviews of 2022 results

Business and social activities that consider local biodiversity are continuously promoted by each company globally through the enthusiasm of those in charge and participants alike. Since biodiversity activities are meaningful only if they are sustained, we believe it is necessary to build a system and foster a culture so that activities will not cease even if the person or organization in charge changes.

Regarding the reduction of photocopying paper, although the number of employees returning to the office has increased, the amount of paper used has been steadily falling each year by users making an effort to cutting their use of paper.

Regarding the promotion of green purchasing, unfortunately the purchasing rate decreased compared to the previous year and the target of 100% was not reached. We will work to raise the environmental awareness of purchasers and consider reviewing structures for purchasing goods compliant with the Act on Promoting Green Purchasing.

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## Main initiatives

### Understanding relationships between business and biodiversity

The ecological footprint assessment completed in 2013 found that the majority of the environmental impact from our business activities resulted from carbon sinks, land on which oil plants were grown, cattle pastures, forests grown for pulp and paper, and fishing grounds affected by surfactants.



Ecological Footprint of Corporate Activities  
[https://www.jstage.jst.go.jp/article/ilcaj/2011/0/2011\\_0\\_164/\\_pdf](https://www.jstage.jst.go.jp/article/ilcaj/2011/0/2011_0_164/_pdf)  
 (Japanese)

In 2021, we used ENCORE to extract the factors that depend on and impact the natural capital of our company, and we extracted five dependent factors and nine impact factors. Each of these factors was identified to derive from palm and pulp, impacts on ecological system after products are discarded, greenhouse gases, waste and so on. We are conducting risk / opportunity analysis and climate change scenario analysis for each of these factors and estimating the financial impacts on our business activities. However, because the analysis was conducted with the entire business in mind, although the scope of coverage was broad, it was not sufficient in terms of digging deeper into each issue.

Therefore, in 2022, we followed the LEAP approach\*1 proposed by the beta version of the TNFD as much as possible, and took an in-depth look at the relationship between business and biodiversity, using detergents, one of Kao's core products, as an example.

We have redefined the issues by examining the results of our 2021 analysis in addition to the latest competitor benchmarks and various guidelines, reports, and other sources. Then, for each of the key issues, we

overlaid a Geographic Information System (GIS)\*2 tool and organized them according to the axis of interest of stakeholders and Kao's business activities. The results are shown below.

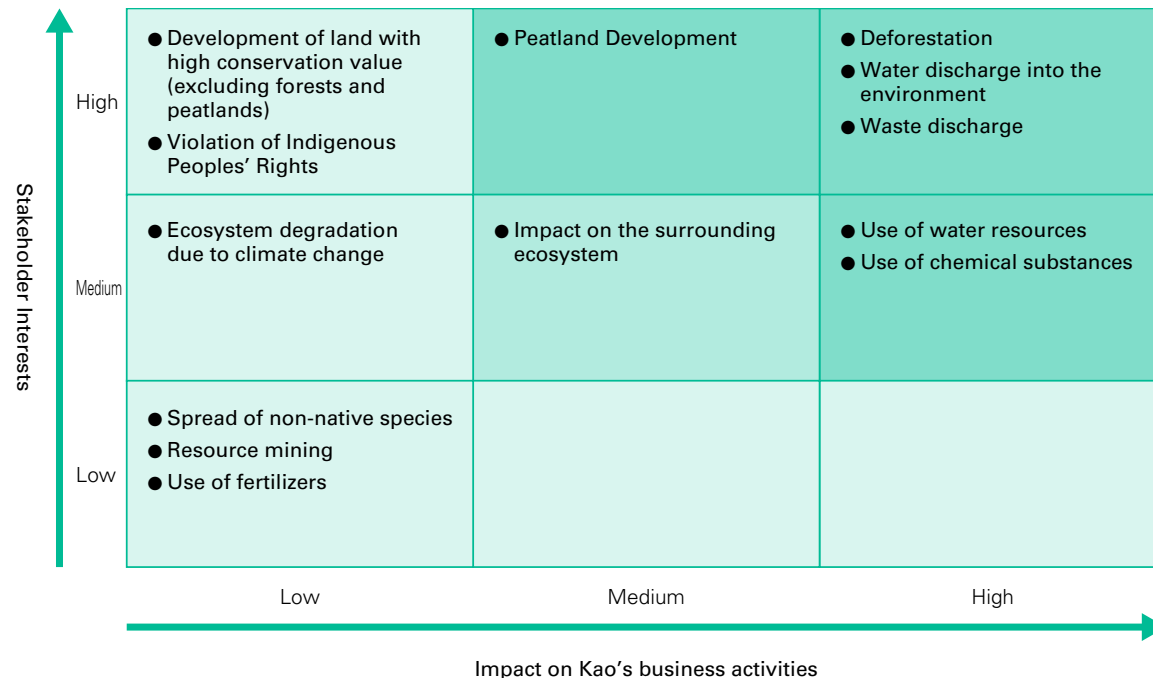
\*1 LEAP (Locate, Evaluate, Assess, Prepare) approach  
 \*2 Geographic Information System (GIS): Technology that comprehensively manages, processes, and visually displays data with location-related information (spatial data) using geographic location as a guide, enabling advanced analysis and rapid decision-making.

### Examples of initiatives using the LEAP approach for detergents

#### Locate: Finding our relationship with nature

As an example of Kao's main product, detergent, we added additional research to the results of the ENCORE

An example of materiality identification for biodiversity (vertical and horizontal axes are relative)



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analysis for 2021 and identified 13 issues as biodiversity risks for Kao. The analysis identified as hotspots the countries of origin of palm (kernel) oil, as well as the locations and countries of sale in areas of water stress and water pollution.

### Evaluate: Assess dependence and impact

For the above 13 issues, we investigated not only the risks that were already apparent but also potential risks, and further analyzed them using GIS data.

We have extracted the following factor in terms of dependence on and impact on nature as some issue that could lead to business risk. Deforestation and peatlands development in the country of origin of the palm (“kernel”) oil in the upstream value chain; water use and wastewater in the direct operational process; water use during product use and wastewater from households after use, chemical substance management and “waste discharge” represented by plastic containers.

### Assess: Identification of risks and opportunities

We used two axes, the axis of stakeholder interest and the axis of importance in Kao’s business activities, to create a relative order of the importance of each issue.

As a result, “deforestation,” “drainage into the environment,” and “waste discharge” were identified as the most important issues.

With regard to “waste discharge,” we anticipate risks in some of the countries where Kao sells our products where the infrastructure is not yet fully developed, for example, in some Asian countries. We believe that addressing these issues and developing applications will create opportunities.

### Prepare: Response to and reporting of risks and opportunities

To prevent deforestation, we aim to introduce forest footprint, source 100% RSPO-certified palm oil (kernel oil), and complete traceability confirmation for oil palm smallholders. We are also implementing SMILE, a program to support oil palm smallholders in Indonesia.

As a measure against “wastewater discharged into the environment,” we are promoting the establishment of voluntary controls that are stricter than regulatory values while ensuring compliance with regulations at each of our sites. In addition, we provide measures to prevent wastewater from draining at home, for example, by providing detergents that have good foam release and require less rinse water. Furthermore, we are also developing a new environmental assessment method, namely bio-assessment technology using environmental RNA.

With regard to plastic waste, which has been the focus of much attention in recent years, we are continuing and strengthening our efforts to reduce the quantity of plastics used, utilize recycled resin, and recover plastic containers and establish recycling technologies.

Since the scenario analysis and disclosure requirements in the TNFD were still under development at the time this analysis was conducted, we were not able to include much in this analysis. And this is an example of the results to the extent we were able to address them. We will await further analysis pending completion of the TNFD.

### Reducing the impact of business on biodiversity

To reduce the various impacts on biodiversity of our business activities, we are continually implementing the following measures. These measures are critical for Kao’s ESG Strategy, and they are listed in detail in this report.

- Reduce the use of raw materials and switch to raw materials that can be sustainably procured and have lower environmental impact

**P91** Responsibly Sourced Raw Materials

- Reducing CO<sub>2</sub> emissions associated with business activities

**P102** Decarbonization

- Reduce the use of and impact on water resources

**P137** Water Conservation

# Biodiversity

- Promote responsible chemicals management  
Through appropriate chemical management throughout the entire lifecycle of chemicals and using science-based risk assessments, we continue to create products to minimize the burden that chemical place on the environment and ecological system.

## Developing technology to minimize materials used and maximize utilization while cherishing the benefits of biodiversity

For many years, we have produced high-grade industrial fatty alcohols using oil and fat raw materials with carbon numbers of 12 to 14 that can be collected from the fruit of oil palm trees and other sources for use in a variety of household products. Fats and oils with carbon numbers of 12 to 14 only account for 5% of the world's production of fats and oils. The remaining 95% are oils and fats with carbon numbers of 16 to 18 (Oil World Annual 2016). Fats and oils with carbon numbers of 16 to 18 contain solid parts unsuitable for human consumption, and as such the usage of these solid parts has been limited until now. Accordingly, we are generating Bio IOS, a high-quality surfactant, by applying materials science and synthesis technologies for surfactants. Bio IOS has already entered practical use in *Attack ZERO*, a concentrated liquid detergent, since 2019.

Demand for palm (kernel) oil may increase as the demand for food increases due to future population growth. Destroying forests and converting them to palm plantations to meet growing demand is not desirable in terms of biodiversity, nor in terms of climate change with regard to losing forests as GHG sinks.

Therefore, Kao has been developing alternative materials to palm (kernel) oil as a way to meet the

increasing demand for palm (kernel) oil, a raw material for surfactants, without destroying forests.

In 2022 we initiated a demonstration study to produce non-edible bio-based nonionic surfactant from non-edible biomass using cassava residue, which is a biomass waste product. Utilizing Kao's enzymes and enzyme production technologies, cassava residue can now be efficiently broken down into sugars, the raw material for some chemicals. By conducting the saccharification process from enzyme production to saccharification at the same plant site, we also aim to reduce CO<sub>2</sub> emissions from transportation.

Furthermore, as a technology for the future, we are conducting research on substituting palm oil for fats and oils produced by algae, which have less environmental impact.

We believed that the ability to use materials that have been developed to minimize materials used and maximize utilization while cherishing the benefits of biodiversity previously had been of limited use as new ingredients in surfactant. However, the expansion of possibilities to use oils that do not compete with food applications will help to conserve biodiversity.

Additionally, for over 30 years, we have conducted R&D on proteins, such as enzymes, and have continued to develop technologies to efficiently produce proteins using microbes such as bacteria. One of these technologies is protein production technology using *Bacillus subtilis*. This technology contributes to obtaining VHH antibodies that neutralize the novel coronavirus, through joint research with Kitasato University and Epsilon Molecular Engineering, as announced in May 2020. Subsequent research results indicated that nasal delivery of the obtained VHH antibodies can inhibit replication of the novel coronavirus in infected lungs of hamster models. Furthermore, the binding pattern

between the SARS-CoV-2 spike proteins and VHH antibodies was elucidated. These results indicate not only that the VHH antibodies are a potential therapeutic agent for the COVID-19 pandemic, but also that there is potential to expand treatment options using a new administration route in the form of nasal delivery.

Kao has also conducted research on RNA from organisms in the environment (environmental RNA) to establish a highly accurate ecological survey method for biodiversity assessment. By using RNA as an indicator, which degrades more easily than DNA, it is less likely to falsely detect organisms that are not present and is also less susceptible to the effects of domestic wastewater. In addition to a comprehensive method for analyzing fish RNA in river water, we have now developed methods for assessing arthropods (aquatic insects) and algae, which are indicators of water quality. This research has the potential to visualize the true state of ecosystems with high precision without the need to capture living organisms.

Through the use of these technologies, we aim to contribute to the sustainability of society and the environment by minimizing the loss of biodiversity due to human activities.

### P83 Transformative Innovation



Successful Treatment for Coronavirus Disease 2019 in Hamster Models: A Significant Advancement for Clinical Use of VHH Antibodies Administered Nasally  
<https://www.kao.com/global/en/newsroom/news/release/2022/20220117-001/>

Fish RNA, Abundant in River Water, Found to Be Useful for Ecological Research  
[https://www.kao.com/jp/newsroom/news/release/2021/20210817-001/\(Japanese\)](https://www.kao.com/jp/newsroom/news/release/2021/20210817-001/(Japanese))

# Biodiversity

## Compliance with international agreements

We undertake business activities in accordance with international agreements and related national and regional laws on biodiversity determined by the Convention on Biological Diversity and its contracting parties, the Conference of the Parties.

In addition, we were one of the first in Japan to announce support for zero deforestation in the procurement targets set in the Guidelines for Sustainable Raw Material Procurement in 2014. We also signed the New York Declaration on Forests announced at the United Nations Climate Summit held in New York in September of that year.

When using genetic resources, we fully consider ABS\* trends and comply with the Cartagena Protocol on the Use of Genetically Modified Organisms to ensure appropriate use and management of such resources.

Going forward, we will contribute to achieving the targets set in The Kunming-Montreal Global Biodiversity Framework, which was internationally agreed upon in December 2022.

\* ABS: Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization

## Initiatives related to palm oil

We are working to address key social and environmental issues related to palm oil (kernel oil), one of Kao's most important natural resources.

One is to educate the public about sustainable production and productivity improvements and to help them obtain RSPO certification. Approximately 600 plantations are scheduled to be RSPO certified by the end of 2022, and Kao plans to purchase all RSPO certified credits sold by certified oil palm smallholders.

Excessive fertilizer application to the soil can also cause soil contamination, water pollution, and changes in the soil ecological system. To this end, we provide free of charge the *Adjuvant* series, a series of chemicals that allow pesticides to spread evenly across plant surfaces and provide guidance on how to use them. The aim is to boost farm productivity, improve profitability by cutting pesticide use, and reduce environmental impact by avoiding excessive fertilizer application.

In addition, one of the targets of The Kunming-Montreal Global Biodiversity Framework states that the views of local people should be taken into account in biodiversity-related decision-making. We expect that the Grievance Mechanism for oil palm smallholders in Indonesia, launched in September 2022, will also contribute. With respect to human rights issues pertaining to oil palm smallholders, we launched a grievance mechanism in collaboration with Caux Round Table Japan (CRT Japan Committee), a non-profit organization specializing in business and human rights. Starting from approximately 50 farms on the Indonesian island of Sumatra, we will sequentially increase the number of target farms. We will also release relevant inquiry details and results of our response on the Kao website.

### P91 Responsibly Sourced Raw Materials



Progress of the SMILE project and commencement of the grievance mechanism  
<https://www.kao.com/global/en/newsroom/news/release/2022/20220413-001/>

<https://www.kao.com/global/en/newsroom/news/release/2022/20220831-001/>

# Biodiversity

GRI 304-1, 304-2, 304-3

## Business activities that consider the planet's ecological system

We have been active in our own green spaces and have engaged in local contribution activities that consider regional biodiversity. There are multiple certification systems in Japan for corporate green spaces that pursue consideration for biodiversity, and we have received certification for the following plants and offices.

Wakayama Plant: SEGES Excellent Stage 1 certification (2005), Superlative Stage certification (2017)



SEGES green certification website: Wakayama Plant, Kao Corporation  
<https://seges.jp/site/A0509.html> (Japanese)

Kashima Plant: ABINC certification (acquired in 2015 and renewed in 2018 and 2021)

Kawasaki Plant: ABINC certification (acquired in 2018 and renewed in 2021)

Odawara Office: ABINC certification (acquired in 2020 and renewed in 2023)



The 10th Association for Business Innovation in Harmony with Nature and Community (ABINC)<sup>®</sup> certified facilities  
<https://www3.abinc.or.jp/facility/10th-creature-facilites/> (Japanese)

The 13th Association for Business Innovation in Harmony with Nature and Community (ABINC)<sup>®</sup> certified facilities  
[https://www3.abinc.or.jp/facility/13th\\_creature\\_facilites/](https://www3.abinc.or.jp/facility/13th_creature_facilites/) (Japanese)

Even after acquiring certification, each plant has maintained and intensified green space conservation activities. The Wakayama Plant obtained SEGES<sup>\*1</sup> Superlative Stage certification, the highest level among five levels of certification, and has maintained that level. Also, the Kashima Plant renewed its ABINC<sup>\*2</sup> certification in 2018 and 2021, the Kawasaki Plant in 2021, and the Odawara Office in 2023.

\*1 Social and Environmental Green Evaluation System

A system that evaluates high-quality green spaces created by companies as well as their day-to-day activities and efforts and certifies well-maintained green spaces that contribute to society and the environment

\*2 Association for Business Innovation in Harmony with Nature and Community

An organization whose purpose is to create mechanisms that enable people to coexist with living organisms, scientifically and technically verify those mechanisms, and promote their commercialization

## Implementing measures based on global biodiversity evaluation criteria

In contrast to this, to the best of our knowledge, there are no certification systems for corporate green spaces outside of Japan where we have production sites. To address this, biodiversity indicators were introduced in 2017 to determine the extent to which local biodiversity-conscious activities are being carried out at each location where we conduct business around the world, and in 2018 and 2019 we completed biodiversity evaluations at all production sites including those sites that we recently acquired. By utilizing the indicators, we can clarify issues from a biodiversity perspective and improve their score by promoting these activities, which will make confirming their progress simpler.

The primary objective of introducing these criteria is to help conserve the biodiversity of the local ecological systems whose benefits individual sites enjoy, by determining current conditions and actively undertaking biodiversity conservation at individual sites or in nearby green spaces with a clear understanding of targets by employees.

We believe that our thinking is communicated to many people involved, including local residents, in an expanding circle of activity, thereby helping to mainstream the concept of biodiversity.

## Kawasaki Plant

### Biodiversity surveys and conservation conducted in green spaces

The cohesive green space with evergreen trees (photo above) has become a healing space for our employees. Since 2017, we have continued to survey the creatures that inhabit the green space, and the number of species has been increasing every year. To date, 472 species (286 plant species, 151 insect species, 23 bird species, and 12 other species) have been identified, 58 more species than two years ago in the 2022 survey. It was a pleasant surprise to confirm the presence of two of the most important species: the *Chloris sinica* (birds) and the giant resin bee (insects). This year we also saw larvae feeding on the *Aristolochia debilis* in the breeding and protection area of the *Byasa alcinous* (see picture below). The *Aristolochia debilis* ecology was expanded from four to nine sites, and many *Byasa alcinous* were dancing. Although biodiversity-related events have not been possible for some time due to the prolonged effects of the COVID-19 pandemic, we continue to conduct greening cleanups and flowerbed activities at each workplace, as well as regular information provision to our employees. We also recycle woodchips made from dead trees, prune and cut branches and trees for use in green space trails, and inject pesticide solutions into weakened trees.

In July 2021, we were certified as a Kawasaki SDGs Gold Partner in recognition of our initiatives and declarations toward achieving the SDGs in four areas, including “biodiversity conservation activities through

# Biodiversity GRI 304-1, 304-2, 304-3

the development of on-site green spaces.” We will continue to strive to maintain the green space while promoting symbiosis between living creatures and people, contributing to the local ecological system and maintaining and improving the healing space for our employees.



## Odawara Office Renewal of ABINC certification

The Odawara Office has approximately 9,000 m<sup>2</sup> of green space, and more than 90% of the trees planted are native species. In 2018, we started our biodiversity conservation activities from the perspective of caring for local biodiversity. After obtaining ABINC certification in February 2020, we have maintained our existing activities and undertaken new initiatives. We passed our renewal audit in August 2022 and were issued a new certificate. The main activities listed under points of strength are as follows.

In 2018, we registered with the Odawara City’s foster care program for the protection of the Sakawa River system medaka (*Odawara medaka*) and received five medaka from the city. In 2019, we successfully hatched medaka eggs, increasing the number to 25. Since 2020, we have been raising medaka in a newly installed medaka pond on a large veranda in our building of the site, which now holds about 130 fish. We plan to return the medaka to Odawara City in 2023. On the same veranda, there is a rooftop green space where we are currently working on raising *Byasa alcinous* (see left picture).

In addition, we are also working to create a new riparian environment in 2022 next to the pavilion located in the greenbelt (Ark Square Garden) placed in the center of the Odawara Office that is habitable for living creatures, and have confirmed aquatic organisms such as *yago* (dragonfly gudgeon). We piled up tree branches generated during tree-thinning operations to provide shelter for organisms, or chipped them to create an environment where *beetle larvae* and other insects can grow (see right picture).



## Sakata Plant Conservation activities based on the Yamagata Kizuna-no Mori Agreement

In July 2021, Kao Sakata Plant signed the Yamagata Kizuna-no Mori Agreement with Yamagata Prefecture and Sakata City regarding forest creation, and named a 3.4-ha Shonai coastal black pine forest (Ohama area, Sakata City), located approximately 1 km north of the Sakata Plant, as Kao’s Forest Ohama as its activity site. It is said that merchants and farmers in the *Edo* period (1603–1867) planted these black pine forests to prevent flying sand. To pass on the history of the black pine forest as a forest for public benefit to the future, the objectives of the agreement include maintaining its function as a flying sand protection security forest, reducing CO<sub>2</sub> emissions by growing black pine, having employees run corporate citizenship activities, and raising environmental awareness among employees through these activities.

On June 25, 2022, 40 employees from Kao’s Sakata Plant and Kao Group Customer Marketing Tohoku gathered at Kao’s Forest Ohama to clear away weeds, cut underbrush, remove sand from stairs, and collect garbage. Also, on October 15, 27 employees gathered to remove ivy attached to black pines and clean the stairs (see photo above and below). There is a

# Biodiversity GRI 304-1, 304-2, 304-3

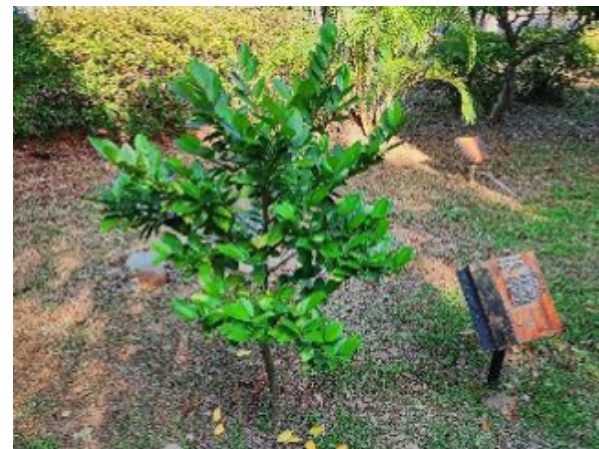
promenade that runs from the residential area to the foreshore, and since there are walkers there, we hope that making the promenade easier to walk on will promote health and safety, and that the cleanliness of the promenade will discourage illegal dumping. We also hope to pass on the importance of forest maintenance to the next generation by using this rich forest resource as a place for local children to learn about the environment and become familiar with it.



## **Kao (Taiwan) Corporation Biodiversity conservation activities in factory green areas**

Kao (Taiwan) conducts the following activities related to biodiversity conservation.

- We have created insect hotels that combine bird nests and educational functions using reclaimed wood from furniture and other sources, and have installed them in the plant's green space and near existing water areas, respectively, to provide hiding and breeding places for living creatures (see picture below). We have done an overhaul for the year 2022. Recently, *Psilopogon nuchalis*, birds endemic to Taiwan, have been regularly visiting the nest boxes for nesting, ants are breeding in the insect hotel, and amphibians are breeding in the water area.
- Biological monitoring activities provide a rough idea of the species (mammals, reptiles, amphibians, and insects) that inhabit the site. To help visitors and employees understand the project, we installed a board explaining the birds and plants living in and around the green space (see picture right). In the future, we would like to provide environmental education for new employees and visitors.



## **KSA Plans to expand the area for planting native wild plants**

Kao Specialties Americas LLC (KSA) is a company in High Point, North Carolina in the south of the United States. A mixed forest of various coniferous and broadleaf trees spreads throughout the site. KSA conducted a biodiversity assessment in 2019, learning that highly varied wildlife, including threatened species, inhabit the area.

Since then, KSA has been promoting biodiversity conservation activities in earnest, and employees are also actively participating. In 2021, in addition to existing biodiversity conservation initiatives, KSA set a target of planting 1,000 m<sup>2</sup> (10,764 ft<sup>2</sup>) with native wild flowers on the site by 2025 and launched action to achieve this target. The main objectives of this program are as follows.

- Provide habitats for pollinators such as bees and butterflies



# Biodiversity GRI 304-1, 304-2, 304-3

- Reduce lawn mowing and fuel requirements by converting traditional lawns to flowering grassland

In November 2021, KSA employees sowed 220 m<sup>2</sup> of wildflower seeds from the southeastern United States obtained from a local seed farm. The colorful blooms of these plants in August and September 2022 have attracted a variety of insects and have also been a delight to the eyes of employees and delivery drivers (see photo below). Again in April 2022, more than 40 employees planted 223 m<sup>2</sup> of wildflower seeds from the same seed farm, but the mature seedlings were mostly eaten by local migratory geese. Therefore, the planting was modified to be done only in the fall and to include beneficial cover crops to further alleviate the problem.

In October, our employees continued the annual program of planting (adding 90 m<sup>2</sup> of new nursery space) plants native to North Carolina that they had purchased themselves. This year, 24 employees participated, planting 10 new seedlings and tending to existing plants (see picture right).




### Collaboration with other organizations

We have been participating in the JBIB since its establishment in 2008. JBIB is an organization of companies from different industries that seriously consider biodiversity conservation efforts and implement specific initiatives. They are divided into multiple working groups on individual topics and discuss how companies can contribute to biodiversity conservation and restoration. This year, the movement to put together various international frameworks such as COP15, TNFD, and SBT for Nature, has accelerated, and through activities within JBIB, we are obtaining information on international trends and exchanging opinions.

Since last year, we have also been participating in the Japan Business Federation's Open-ended Working Group on the Post-2020 Global Biodiversity Framework. Here, we discuss and make proposals on the content of the Post-2020 International Biodiversity Framework and the domestic policies to be established based on it, as well as the impact on business activities, issues, and requests.

From April 2022, we are participating in the TNFD forum to provide feedback and gather information for the beta version to be released by TNFD. We have also joined the TNFD Consulting Group (TNFD Japan Council) to keep abreast of TNFD developments and exchange information with other companies.

 **TNFD Forum**  
<https://tnfd.global/about/the-tnfd-forum/>

