Consideration for biodiversity in the personal care products industry in Japan

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Abstract

Personal care products, such as shampoos and soaps, contain many chemicals and pose a significant risk to aquatic organism and biodiversity　if spilled. Many reviews have been published on the hazards of chemical substances, but there is a need to focus not only on disposal but also on procurement with the high risk of an environmental impact on the green supply chain. This study investigates the importance of green supply chains for personal care products based on a quantitative survey of four major domestic daily necessities companies using the renewal raw material procurement indicators. Finally, three implementations were found as follows: (1) Ways to promote certified products, (2) Review of the harmful chemical list, and (3) Rulemaking as a domestic industry with green marketing from the author's industry experience.

国内パーソナルケア製品業界における生物多様性への配慮

長井 美有紀[1]

Abstract

シャンプーや石鹸などのパーソナルケア製品には多くの化学物質が含まれており、流出すると水生生物などの生物多様性に大きなリスクをもたらす。化学物質の有害性については多くのレビューがあるが、廃棄だけでなく、グリーンサプライチェーンにおける環境影響リスクの高い調達にも着目する必要がある。本研究では、国内大手日用品企業 4 社への定量調査から、最新の原材料調達指標を用いて、パーソナルケア製品のグリーンサプライチェーンの重要性を探りる。そして、筆者の業界経験などから、（1）認証製品の普及促進、（2）有害化学物質リストの見直し、（3）グリーンマーケ

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ティングによる国内業界としてのルール作り、という 3 つの実施策を見いだした。

Keywords
Personal care products, biodiversity, green supply chain,

1. Introduction
Personal care products usually involve some chemicals due to the characteristics of the product. Personal care products are defined here as shampoos, soaps, detergents, toothpastes, and other products, which most people, regardless of gender, use on a daily basis as part of their lifestyle. Such products also involve chemicals that are harmful to the global environment, especially conservation of biodiversity. Mukherjee et al. (2024) reported that the continuous release of chemically persistent substances from personal care products into the aquatic environment can have a detrimental effect on aquatic flora and fauna. As a result, regulations are progressing in a variety of countries; however, there are few regulations on plastics and environmentally harmful chemicals in Japan.
On the other hand, in the domestic personal care industry, sustainability has been developing in response to the rise of sustainability concerns and the SDGs in Japan since around 2019, such as the establishment of a sustainability management policy to eliminate the negative effects of these chemical substances. This movement is a little faster than the cosmetics industry, which has a similar supply chain and similar products. The personal care industry is also under pressure to address the problems of plastics and toxic chemicals.

2. Issues and Current Status of Sustainability and Biodiversity in the Personal Care Industry
Industry-specific environmental and social issues include environmental considerations for chemical substances, plastic containers, and plastic ingredients, as well as the abundant use of palm oil as one of the raw materials of personal care products. Spreading each issue at a global level has led to a threat to biodiversity.

2-1 Palm Oil
Palm oil, which is extracted from palm fruits, is involved in many personal care product categories such as soaps, shampoos, and creams. The oil has the effect of stabilizing and smoothing the solution and increasing the cleansing power. Palm oil is collected from the palm trees grown in the tropical regions such as Indonesia and Malaysia, and global

needs are concentrated in those countries. In order to respond to the excessive needs of developed countries, these countries have randomly reclaimed farmland, caused drought, and created social problems, such as the exploitation of farmland by governments. The loss of palm forests threatens the habitats of orangutans and other wildlife. In order to solve these problems, palm oil certification, such as RSPO,[2] has begun. However, the current situation is that the supply is insufficient.

2-2 Plastic Containers and Ingredients

Because of the properties of the chemical solutions, plastic is often used for the containers of personal care products. Since the product is often in liquid form, using plastic containers can reduce the product weight, making them ideal for transportation and storage. They can also be kept clean. Like PET bottles, such containers might become microplastics, which pollute the oceans, soil, and air. So, the containers need to be properly collected and disposed of so that they do not contaminate the ocean. In recent years, however, recycled containers and refilling containers have been adopted. . Overseas, there is a format for selling by weight (bring a container for the contents sold in the store), which some brands are advancing in Japan.

In addition to plastic containers, personal care products may contain plastic ingredients. Called microbeads, they are formulated to enhance the cleansing power of the product. The microbeads are used in detergents and scrubs to wash the face or body. Since they are formulated in a microplastic state from the beginning, there is a high risk that they will flow directly from the domestic wastewater into rivers and the ocean during or after using the products. Since the danger of microplastics is already known, they disrupt marine ecosystems and threaten marine biodiversity. In the EU, the enforceable regulation of microplastics began in 2024, where the sale of products with microplastics intentionally mixed into the products is prohibited. Japan also established regulations in 2020 to reduce the use and circular of plastic resources, but they are not as binding as in other countries because there is no mention of microplastics.

2-3 Chemical Pollution

The personal care industry's response to chemical contamination has been underway for some time. Care must be taken to ensure that factory wastewater and waste do not adversely affect the local environment. In addition, the United Nations has recently

[2] Roundtable on Sustainable Palm Oil

made references to the slogan "Beat Chemical Pollution" in order to raise awareness of solutions to chemical pollution for the conservation of biodiversity. In the industry, the management of the total emissions of substances subject to the PRTR[3] system and the environmental impact of surfactants are the mainstream; however, a large number of chemical substances are also used in the production of plastics, and it is necessary to pay attention to harmful silicates that adversely affect corals, other marine organisms, and the environment, such as some ultraviolet absorbers. The environmental pollution caused by ultraviolet absorbers has resulted in coral bleaching and genetic abnormalities in shellfish. Corals, in particular, are almost endangered because of this bleaching, in addition to the effects of climate change. The beaches in Hawaii and other countries have banned the use of UV care products containing the harmful chemicals that adversely affect these corals, but there are no specific regulations in Japan.

2-4 Indicators of Biodiversity Considerations in the Personal Care Industry

Takai and Nagai (2024) show that four top classifications and nine subclassifications are presented as criteria for consideration of biodiversity in the cosmetics industry, which has an industrial structure similar to that of the personal care industry. In fact, the personal care industry also developed products related to cosmetics, such as skin care products. In addition to these criteria, some elements are added for the achievement of green supply chains,[4] and newly considered the following criteria for personal care products.

No.	Classifications	No.	Subclassifications
1	Climate Change	1	Monitoring/Controlling CO_2 emission
2	Biodiversity	2	Sustainable/Biodynamic agriculture
		3	Natural/Vegetable raw materials
		4	Fair trade
		5	Sustainable packaging (Beat plastic pollution)
		6	Monitoring wastewater
3	Certification		
4	Pollution	7	Beat chemical pollution
		8	Beat waste pollution

[3] Pollutant Release and Transfer Register
[4] The whole environmentally friendly process from the procurement of raw materials for goods and products to the manufacture, sale, and delivery to consumers for consumption

5	Social issues	9	Respect for human rights
		10	Gender quality
		11	Cruelty free

Table 1. Standards for Consideration of Biodiversity in Industries in the Personal Care Industry

Source：Created by the author based on Takai & Nagai (2024) and UNEP website[5]

Based on the new criteria of these five classifications and 11 subclassifications, biodiversity considerations in the domestic personal care industry are analyzed.

3 Trends in sustainability and biodiversity conservation efforts of the four major domestic companies

Because of sustainability concerns and the SDGs trends in Japan, companies have been moving to consider environmental and social issues in the personal care industry as of around 2019. Kao, the largest company in the personal care industry, launched a new ESG strategy in 2019, and since then, the strategy has gradually spread throughout the industry. This study investigates the current status of biodiversity considerations in the industries of four major domestic companies through quantitative research. The companies under investigation are those that primarily handle personal care products, specifically the top four companies from the *Nikkei Newspaper's* daily goods sales ranking[6], including Kao, Lion, Rohto Pharmaceutical, and Kobayashi Pharmaceutical.

Achieved　Processing

Classifications	Subclassifications	Kao	Lion	Rohto Pharmaceutical	Kobayashi Pharmaceutical
Climate Change	Monitoring/ Controlling CO_2 emissions	△	△	△	△
Biodiversity	Sustainable/ Biodynamic agriculture	×	×	×	△
	Natural/ Vegetable raw materials	×	×	×	△
	Fair trade	×	×	×	×
	Sustainable packaging[7]	△	△	△	△

[5] UNEP Website, Beat Pollution, https://www.unep.org/beatpollution/ Last viewed on Jan. 11, 2025
[6] Nikkei Newspaper Web, Daily necessities and household goods, https://www.nikkei.com/nkd/industry/complist/?n_m_code=062&DisplayType=0&hm=1, Last viewed on Jan. 5th, 2025
[7] Involving FSC and biodegradable

	/Beat plastic pollution				
	Monitoring wastewater	○	○	○	○
Certification		RSPO △ FSC × （No actual value /2023）	RSPO × FSC △	× RSPO (Just joining external initiatives/2023)	× RSPO FSC （No actual value /2022）
Pollution	Beat chemical pollution	Ordinary ○ -Microbeads △ -Ultraviolet absorber △	Ordinary ○ -Microbeads × -Ultraviolet absorber ×	Ordinary ○ -Microbeads × -Ultraviolet absorber × (Only goal setting.)	Ordinary ○ -Microbeads × -Ultraviolet absorber ×
	Beat waste Pollution	○	○	○	○
Social issues	Respect for human right	○	○	○	○
	Gender quality	△	×	△	△
	Cruelty free[8]	○	×	○	×

Table 2. The current state of sustainability and biodiversity in the personal care industry

Source: Created by the author from websites of the four companies, annual securities reports, sustainability reports, and ESG reports

3-1 Climate Change / Monitoring & Controlling CO_2 Emissions

Scientific evidence already shows that climate change has a lot to do with biodiversity. In response to the acceleration of the global movement toward achieving decarbonization by 2050, major companies in the personal care industry in Japan are also making efforts for decarbonization. Kao achieved a reduction in CO_2 emissions (Scope 1+2) at all Kao Group sites by 35% in 2023 compared to the base year (2017), and the current aim is to reduce CO_2 emissions by 55% by 2030. Lion aims to halve CO_2 emissions throughout the life cycle of products by 2050. They have achieved a 55% reduction compared to their goal, but all four of their plants achieved zero emissions in 2002, and in 2017, they achieved zero emissions at all of their domestic offices, including research and other offices. Rohto Pharmaceutical reduced total greenhouse gas emissions with Scope 1 and 2 and non-consolidated compared to FY 2013, where they achieved 19.6% (2023). Kobayashi Pharmaceutical hopes to reduce Scope 1 and 2 GHG emissions by 51% by 2030 (base year 2018 and reduce Scope 3 GHG emissions by 15% by 2030 (base year 2018). They set the target of reducing the group's GHG emissions (base year 2018) by 51% for Scope 1 and 2 and 15% for Scope 3 by 2030. They also aim to reduce CO_2 emissions by more than 10% at any stage of the product life cycle.

[8] The tests on animals

3-2 Biodiversity

In recent years, efforts related to biodiversity conservation have finally begun to be emphasized in Japan, and these four companies have announced their efforts for biodiversity conservation. Most of them increased the use of sustainable raw materials procurement, such as palm oil and paper resources, as well as acquisition of RSPO and FSC certification. Most are also working towards solving plastic pollution , and initiative for TNFD. It is a novelty that Kao and Rohto Pharmaceutical disclosed its efforts for microplastics and coral protection.

3-2-1 Sustainable/Biodynamic Agriculture

In the personal care industry, natural capital is used for products and chemical raw materials. Raw materials grown under sustainable agriculture and regenerative agriculture conditions are desirable for biodiversity conservation. One example is organic agriculture, which uses organic ingredients to keep the soil healthy and can lead to abundant biodiversity. Plant raw materials obtained through organic agriculture can also lead to the acquisition of organic certification of products, which is beneficial for highlighting sustainability to consumers. Only Kobayashi Pharmaceutical among the four companies has sustainable products that used more than 50% of plant-derived raw materials as organic ingredients.

3-2-2 Natural/Vegetable Raw Materials

In recent years, attention has been growing in various industries towards plant-based materials due to the lower GHG emissions compared to animal-derived materials, such as by livestock. Of course, the industry does not use livestock ingredients, but for example, many of the fullerenes contained in creams are derived from sharks, which are then considered animal-derived ingredients. GHG emissions from catching sharks are not that high, but consumer preferences for plant-based materials tend to eliminate animal-derived raw materials. Most companies do not handle natural ingredients, only Kobayashi Pharmaceuticals uses plant-based ingredients as mentioned in 3-2-1.

3-2-3 Fair Trade

In the sustainable procurement of raw materials, the human rights of suppliers are an important issue. It is also necessary to have the perspective of fairness for not only people but also for the environment. It is important to be fair to both the global environment and the people who work in it. Although Kobayashi Pharmaceuticals only has experience with the education of employees about fair trade, there is a delay in the development of

products that take fair trade into consideration in Japan.

3-2-4 Sustainable packaging / Beat plastic pollution

The Plastic Resource Circulation Promotion Act, which came into effect in 2020, led to the efforts to reduce plastics, especially plastic containers and packaging, in the various industries. In the personal care industry, companies have been actively switching to recycled or biodegradable plastics and strengthening refilling and collection efforts since around 2020. Kao aims to reduce the amount of fossil-derived plastics used to zero by 2050 and to reduce plastic packaging container waste.[9] They have achieved 81% of recycled plastics used in PET containers (2023). Kao started a demonstration experiment for a new collection plan using the recyclable collection route of local governments in order to realize horizontal recycling of plastic packaging containers for daily necessities. Lion set the target of 70% or less petrochemical-derived plastics in use (2023), and the goal was 98% achieved. In addition, they expanded the use of recycled plastics and biomass materials in products, containers, and packaging. Rohto Pharmaceuticals plans to formulate targets to reduce the amount of plastic used in containers and packaging in Japan, which covers the rate of usage of environmentally friendly paper in containers and packaging materials as an alternative to plastic. They achieved 65.6% in 2023 among the targets of 100% by 2030. They also promote a target for microbeads, where it is already formulated in the form of microplastics. Kobayashi Pharmaceuticals aims to make their containers and packaging from at least 10% recycled raw materials and at least 20% plant-derived raw materials like biomass plastics.

3-2-5 Monitoring Wastewater

The personal care industry uses a lot of water in the manufacture of products. In addition, many of the products contain water, and sustainable methods of water use have always been required. Kao, whose water consumption was 16.2 million m^3 in 2023, already set the target of reducing water consumption by 45% (per unit of sales) compared to 2005 levels by 2030 and by 10% compared to 2017 levels throughout the product life cycle (per unit of sales) for all Kao Group sites. Water recycling and cascade use are also being carried out. Lion achieved a 30% reduction in water consumption throughout the life cycle of products compared to 2017. Rohto Pharmaceuticals reprocesses and recycles the wastewater generated in the process of purifying groundwater, which is partially used, in an effort to efficiently use the valuable water resources through regular daily

[9] Kao's involvement in plastic recycling is higher than the amount of plastic packaging containers used by Kao.

monitoring and adjustment. Kobayashi Pharmaceuticals continuously monitors the amount of water intake, wastewater, and quality of wastewater every year to reduce water consumption as much as possible while achieving stable production of high-quality products.

3-3 Certification

First of all, certification is the criteria to be shown as sustainable and biodiversity-considered products. Overseas, a certification system has existed for the purpose of returning products to the industry, and the certification is highly recognized among consumers. The most common certifications for personal care products are diverse, including organic agriculture certifications, chemical certifications, cruelty-free certifications, forest certifications (such as RSPO and FSC), packaging certifications like biomass certification, and fairtrade certifications. As stated in 3-2-1, if raw materials obtained from organic agriculture are adopted, organic certification is approved for raw materials, and organic certification can be granted to products, but Takai and Natai (2023) indicated that recognition of certifications, including organic certification, is low in Japan. Although organic agriculture in Japan is increasing every year for organic farming initiatives in the total arable land area, the product ratio is about 1.2% (2016).[10] Certifications that are familiar to the industry, which is the industry's biggest issue, for palm oil certification like RSPO and certificated paper like FSC, which has recently become synonymous with sustainable packaging, are often listed in the biodiversity goals of the four companies. The companies have set a target of increasing the adoption of certified palm oil for production to 100% by 2030 and other years, and although it seems that the acquisition of RSPO certification is progressing, in particular, the current situation is that there is an insufficient supply due to soaring demand from developed countries. Kao's certification ratio was 40% (2023). Lion and Kobayashi Pharmaceuticals have no actual data yet, even if they set targets. As for Rohto Pharmaceuticals, they have only participated in external initiatives (2023).

FSC certification as sustainable paper resources and as an alternative to plastics is becoming more popular in Japan. Four companies have set targets for FSC certified paper. By 2025, Kao aims to switch to 100% certified paper and pulp for use in its products. Lion's Reed Cooking Paper brand has been renewed as an FSC-certified

[10] Ministry of Agriculture, Forestry and Fisheries document "Current Status of Organic Agriculture in Our Country" July 26, 2019, https://www.maff.go.jp/primaff/koho/seminar/2019/attach/pdf/190726_01.pdf Last Viewed on Jan. 13, 2025

product, then certified paper and pulp has been achieved at 75% (item ratio). Kobayashi Pharmaceuticals promotes the procurement of paper that considers sustainability, such as FSC-certified paper.

3-4 Pollution

Pollution, which is one of the three major global issues along with climate change and biodiversity, seems to have been discussed in recent years as marine pollution caused by plastics; however, not only marine pollution but also soil pollution and air pollution have been mentioned. In recent years, the United Nations has been advocating the reduction of pollution by various chemical substances under the slogan, Beat Chemical Pollution, as well as promoting industrial waste and consumer disposal in the supply chain under the slogan of Beat Waste Pollution. The personal care industry often uses a lot of chemicals and generates waste, so these are also important issues.

3-4-1 Beat Chemical Pollution

In response to these developments, companies have been responding to chemical contamination from an early stage. Until now, the outflow of chemical substances from factories into rivers and oceans has attracted attention only for their effects on the human body, but in recent years, responses have also been carried out to preserve the surrounding environment. This study focuses on and investigates harmful chemicals in detergents and UV care products.

As for microplastic and some ultraviolet absorbers harmful to corals, Kao and Rohto Pharmaceuticals already set targets to reduce microbeads and ultraviolet absorbers, though actual figures for both have not been announced. Kao already set the policy to disclose the use of 18 ingredients—alkyl sulfate, 1,4-dioxane, formaldehyde free preservatives, parabens, microplastic beads, preservatives, silicones, talc, ultraviolet absorbers, fragrances, aluminum salts, PEG (polyethylene glycol), mineral oil, phenoxyethanol, fluorine (fluoride), BHT (dibutyl hydroxytoluene), oxybenzone, and octanoate—by 2022. In 2023, Kao disclosed an approach to two key ingredients (octocrylene and homosalate) in the skincare business, which Kao considers important for global expansion, and disclosed a policy for a total of 20 ingredients. Lion's line with the concept of the Strategic Approach to International Chemicals Management (SAICM) is to strive to promote sound management throughout the life cycle of chemical substances, minimize significant adverse impacts on the environment and human health, and promote communication; however, the company has not made any announcements

on microplastics. Rohto Pharmaceuticals are working to reduce emissions of chemical substances that lead to air pollution, such as nitrogen oxides (NOx), sulfur oxides (SOx), soot and dust, and volatile organic compounds (VOCs), but the company has not made an announcement on the actual figures of reducing microplastics. Kobayashi Pharmaceuticals appropriately manages the chemical substances used in R&D and manufacturing, and the company has initiatives on chemicals harmful to the global environment.

It is easy to associate the elimination of environmentally harmful ultraviolet absorbers with the conservation of corals, which was a statement of intention by Rohto Pharmaceutical. Regardless of the actual figures, this presentation will also lead to consumers and increased awareness of issues because some UV absorbers are not often considered harmful to corals.

3-4-2 Beat Waste Pollution

Kao's total amount of waste generated in 2023 was 194,000 tons, a decrease of 19,000 tons from the previous year. Although sales declined slightly, the reduction rate per unit of production (sales) improved significantly by 38%. Lion handles the original toothbrush recycling project, efforts to reduce collection costs, and more. Rohto Pharmaceutical's efforts other than plastic consumption include wastepaper, and scrap iron. At Kobayashi Pharmaceuticals, at least 10% of the content is made from recycled raw materials. The company reduced waste by more than 10% compared to standard products and defined as reducing the amount of waste generated to less than 1% to be treated at the final disposal site.

3-5 Social issues

Although social issues are not directly related to biodiversity, they are necessary because they become the criteria for consumers to judge companies and develop into human rights issues in the supply chain related to biodiversity. Although all four companies have in-house human rights policies, none of them, unfortunately, are enthusiastic about human rights issues in the supply chain. Gender equality is an issue not only in this industry but in Japan as a whole, but the issue is still developing.

Cruelty-free testing of animals is required as the perspective here. Even if such testing is for the safety test of a product, the perspective is that animals should not be sacrificed. Animal experiments are subject to penalties for the use of wildlife, but laboratory

animals are bred by humans and are not directly related to biodiversity. However, in response to the trend in Europe and other countries, it is becoming one of the factors that determine the judgment of the corporate image. Kao and Rohto Pharmaceuticals have announced that both will not engage in animal experiments and will seek alternatives to animal testing.

4. Movements in the Global Supply Chain

Decarbonization is also progressing with regard to the global supply chains, and the calculation of Scope 3 CO_2 emissions has become mainstream at major companies. As part of the ESG investment, investment in supply chains has also progressed. In the sustainable-developed EU, various regulations have been put in place based on human rights in the supply chain and the Circular Economy Action Plan. First, the proposed regulation banning products made with forced labor, which came into effect in September 2022, targets products to prohibit the import and sale of products relying on forced labor within the EU, as well as exports outside the EU. Subjects related to the personal care industry include minerals and palm oil. The regulations involved in the Circular Economy Action Plan related to personal care products are the Proposed Eco-design Regulation for Sustainable Products, Greenwash Prohibition Law, Regulation Regarding Packaging and Method Waste, and Regulation Regarding Certification Framework for Carbon Sterilization. The Eco-design Regulation proves the sustainability of a product in a digital product passport. The Packaging and Packaging Waste Regulation Proposal mandates the reduction of packaging waste and promotes the recycling and reuse of packaging materials. These have been agreed upon and implemented in 2022–23, and it is very beneficial to be able to take an approach that is in line with the manufacturing process and supply chain. The personal care industry also needs to make regulatory reforms with its own standards. In addition, when it comes to green supply chains, it is often said that GHG emission control is a valid point, but it is desirable that consideration be given to procurement and disposal with a high environmental impact. The personal care industry would continue to be required to procure sustainable palm oil and proper disposal of packaging.

5. Conclusion

Biodiversity conservation of personal care products requires integrated consideration because chemical substances are often used in manufacturing. Three implementations were found through this study: (1) Ways to promote certified products, (2) Review of the harmful chemical list, and (3) Rulemaking as a domestic industry with green marketing,

which are based on the author's industry experience and interviews with companies and more.

First of all, there is the difficulty of procuring certified palm oil. Even if the company is a member of the RSPO, it cannot maintain the supply from suppliers, and it is not soon included in the products that are being developed due to product lots. As a way of showing consumers and investors, it is necessary to clearly demonstrate that the procurement of certified palm oil and sustainable paper resources, such as FSC, is insufficient.

Second, in addition to the conventional management of chemical substances so far, ultraviolet absorbers and microplastics, which have a negative impact on the global environment, must be listed from the perspective of biodiversity conservation. As for microplastics, it is also necessary to consider not only regulations on plastic resources but also regulations on microplastics as product ingredients regulated by the government, as well as EU regulation. As for harmful UV absorbers, it is necessary to promote coral conservation activities in Japan, most of which are designated as endangered species. Third, in the midst of a complex stream of sustainability information, companies must provide information that consumers can trust. It is necessary to disseminate information so that it does not become greenwashing or SDG washing. To this end, it is necessary to adopt eco-design for the entire supply chain as in the EU.

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