# Water Conservation GRI 303-1, 303-2

Kao is promoting water conservation throughout the entire product lifecycle by providing products that conserve water during use, and which have high water-saving benefits.

## Social issues

Water is necessary to life for all plants and animals on the planet. All humans also need access to sustainable sources of sanitary water in order to maintain wholehearted satisfaction and enrichment. In Japan, water used for washing apparently accounts for the largest share of total household water usage*1. Furthermore, given that water used by Japanese households when using Kao products accounts for around 15% of all household water usage in Japan*2, we recognize that we have a big role to play within society in relation to water resource conservation.

Currently, problems including localized torrential rains and floods, chronic drought and related long-term dry conditions, are arising in many regions and are predicted to grow in severity due to future population growth and climate change.

In addition, water is a local resource, and consequently, for example, even when the same amount of water is taken from a river, there is a significant difference in terms of the impact on water resources between water taken in a water resource-rich basin and water taken in a water-stressed watershed. For this reason, when we undertake sustainable operation, we are aware that we need to take action both to reduce the company's own water risk and to give consideration to the local environment Kao's creating value to address social issues and local residents.

*1 Water Resources Department, Water and Disaster Management Bureau, Ministry of Land, Infrastructure, Transport and Tourism
*2 Based on a survey conducted by the Kao Group

## Policies

The product use stage accounts for around 90% of total lifecycle water usage for Kao products, with the raw materials procurement stage accounting for only around 10%. As one of Japan's leading manufacturers of consumer products, we are demonstrating leadership by actively rolling out new, water-saving products and striving to realize effective engagement with government bodies and suppliers.

We continue to implement activities aimed at minimizing the negative impact on water conservation at every stage, from product development through to disposal.

We will promote "eco together" activities in relation to water-saving products, in line with the Kao Environmental Statement, which embodies our commitment to ensuring that "Kao products utilize original Kao-developed technologies to minimize the impact they have on the environment, not just in the manufacturing process, but in the daily life of the customers who use them. From raw materials procurement and production, to distribution, sales, usage and final disposal, we want to engage in 'eco together' with stakeholders, including consumers, worldwide in the life cycle that involves our products."

In our Basic Principle and Basic Policies on Environment and Safety, we undertake to "assess environment and safety aspects throughout the entire lifecycle of the products, from manufacture through disposal, when developing products and technologies" and to "offer products with a lower environmental burden." Furthermore, the Kao Group Responsible Care Policy contains the following declarations: "We will strive to develop technologies for products that consumers and customers can use with peace of mind, as well as striving to provide products that have a low environmental impact," and "We shall strive to continue to reduce the environmental impact of our business activities by promoting reduction of uses of resources such as water."

Web Basic Principle and Basic Policies on Environment and Safety
https://www.kao.com/content/dam/sites/kao/www-kao-com/global/en/sustainability/pdf/environment-safety-principle-policies.pdf

Kao Group Responsible Care Policy
https://www.kao.com/content/dam/sites/kao/www-kao-com/global/en/sustainability/pdf/responsible-care-policy.pdf

Kao Environmental Statement
www.kao.com/content/dam/sites/kao/www-kao-com/global/en/sustainability/pdf/environmental-statement.pdf

## Strategy

### Risks and opportunities

**Risks**

The number of people living in the world's major cities continues to increase. If urban water infrastructure is unable to keep pace with urban residents' continually increasing demand for water, then residents may not have enough water to use, and it may be impossible to implement wastewater treatment properly. In this case, citizens' cleanliness and hygiene may be under threat. Furthermore, if the cost of municipal water supply rises, then plant operation costs will rise too, with a risk that this may lead to reduced profits. Plants need to act with consideration for the environment and residents of watersheds, and we believe that failure to do so will give rise to reputational risks among local residents and others.

# Water Conservation GRI 303-1, 303-2

Due to the effects of climate change, the impact of drought and localized torrential rains is being seen all over the world. Governments and business enterprises are implementing various measures to reduce GHG emissions, but further rises in temperature are inevitable, and the resulting impacts are sure to become even more serious.

Starting in 2020, the COVID-19 pandemic has seen the emergence of new risks and opportunities. At the same time, water use has increased throughout the product lifecycle, particularly during use. As a result, there is a growing possibility that we may not be able to achieve our water reduction targets. Failure to achieve these targets could incur risk of damage to the company's reputation. Even though people's awareness of sanitation has been heightened, if drought occurs, there is a risk that they will not be able to perform cleaning activities adequately, and so will not be able to maintain the Kirei Lifestyle.

### Opportunities

Because the rise in awareness of the need to save water and the need for cleanliness and hygiene, which has emerged in relation to climate change, is closely linked to our business areas, current developments also represent a significant opportunity for us. Continuous implementation of measures to reduce plant water usage in response to the situations outlined above should lead to both cost reductions and increased profits.

Rising awareness of the need to save water will create opportunities for increased sales of water-saving products for washing clothes, washing one's body, etc. Furthermore, rising awareness of the importance of cleanliness and hygiene will generate opportunities for increased sales of all cleansing products.

### Strategy

We recognize that water is not only an important raw material for producing Kao's products, but it also assumes an important role because Kao products that require water are used at home. Due to the influence of global warming and related reasons in recent years, we run an increased risk of drought in many parts of the world. We believe that Kao products that require water should use as little water as possible. Accordingly, we continue to actively develop water-saving products. Once stakeholders recognize our initiatives to save water and understand their value, it will lead to product selection and contribute to increased sales.

### Social impact

We aim to substantially improve water usage efficiency in all stages of the product lifecycles. At our plants, we set targets and continue to aim for water use reduction. We believe that this contributes toward safeguarding the river basins (rivers and their sources) that are used to supply water to the plants.

As a good corporate citizen with strong roots in the community, we work actively to provide support for local residents when their livelihoods are threatened by water risk.

We are also developing water-saving products, which we are rolling out globally, to reduce water use during product use. As we see it, in this way, even if restrictions are placed on water use, consumers can continue to enjoy lives of cleanliness.

Achieving water-use targets for all Kao Group sites will contribute to sustainable availability or supply of fresh water in the river basins where water sources used by plants are located, and will have a positive effect on conserving ecosystems. Moreover, achieving targets for the amount of water used during product use and during the entire product lifecycle will reduce the burden of waterworks infrastructure maintenance, and reducing the amount of water used by consumers will lead to them paying lower fees for water and sewer services.

### Contributions to the SDGs


### Business impact

Achieving water use targets for all Kao Group sites will contribute to the sustainable availability or supply of fresh water in the river basins where water sources used by plants are located, and will have a positive effect on conserving ecosystems. Moreover, achieving targets for the amount of water used during product use and during the entire product lifecycle will reduce the burden of waterworks infrastructure maintenance, and reducing the amount of water used by consumers will lead to them paying lower fees for water and sewer services. We think that we can expect an increase in sales and contribute to the achievement of the Kao Group Mid-term Plan 2025 (K25) through consumer sympathy for the use of water-saving products not only in drought areas and in times of disaster.

* Source: Development Bank of Japan, The Water Supply Sector: Future Forecasts and Management Reform, 2017

# Water Conservation GRI 3-3, 303-1, 303-2, 404-2

## Governance

### Framework

Under the supervision of the Board of Directors, risk management in relation to water conservation issues is carried out by the Internal Control Committee and opportunity management is carried out by the ESG Managing Committee. These committees are both headed by the President & CEO.

Risk management related to water conservation issues is carried out by the Internal Control Committee (which meets twice a year) and its subordinate body, the Risk & Crisis Management Committee (which meets four times a year). These committees are headed by the Executive Officer Responsible for Corporate Strategy. The Responsible Care Promotion Committee, which manages policy / regulatory regime and technology risks, and the Risk & Crisis Management Committee, which manages market, reputational and acute risks, are under the Internal Control Committee. These committees are headed by the Executive Officer Responsible for Corporate Strategy.

These committees are headed by the Executive Officer Responsible for Corporate Strategy. The Risk Management & Responsible Care, Corporate Strategy acts as the secretariats for the Responsible Care Promotion Committee and the Risk & Crisis Management Committee.

The ESG Managing Committee (which meets six times a year) is responsible for managing opportunities related to water conservation issues. Comprising outside experts, the ESG External Advisory Board provides advice and suggestions on issues raised by the ESG Managing Committee and offers outside viewpoints to be reflected into management, and the ESG Promotion Meeting executes the strategies. Committee members are the persons in charge of the Business, Sales, R&D, SCM and other divisions, an arrangement which connects divisions horizontally. The Internal Control Committee, and the ESG Promotion Meeting that it supervises, discuss water and other environmental issues, as well as social and governance issues. The committee reports on its activities to the Board of Directors one or more times a year and is audited by the Board of Directors.

P18 Our ESG Vision and Strategy > Governance

### Education and promotion

As the product use stage accounts for around 90% of total product lifecycle water use, it is important to design products that contribute to saving water. For this reason, we provide employees with numerous opportunities to learn about this.

By giving our employees opportunities to learn about water through various programs, we can ensure that they will actively engage in water conservation activities of their own accord when engaging in water conservation at plants or conducting R&D on water-saving products. This will raise the overall level of our water-saving activities.

Our employees are not only in a position to develop and supply products, but once they leave the company, they are consumers for the rest of their lives and are among those who select such products. Therefore, it is important that employees also undertake measures to conserve water in their role as consumers. Starting in 2021, we have begun making and disseminating educational videos relating to water conservation for internal use for all employees that are specific to the themes of the Kirei Lifestyle Plan.

### Collaboration and engagement with stakeholders

We recognize that, in order to help consumers realize the Kirei Lifestyle, it is vital for us to deepen mutual understanding with all stakeholders and to collaborate with them by developing interactive communication.

As the water consumed in our production activities impacts local communities, having good communication with local communities is vitally important. Many of our plants compile an annual environmental report, and communicate with local residents.

In order to solve water issues faced by countries and regions, we actively participate in programs organized by the central government, local government authorities, NPOs, and others. We play a leading role in the Future of Washing Initiative, which is gathering wisdom from industry, academia, government and ordinary citizens across the boundaries of traditional business domains and academic fields, and discussing and proposing washing solutions for the future. We are implementing a water conservation campaign in China and are participating in the Water Project conducted by the Ministry of the Environment of Japan.

It is essential that suppliers in high water-risk sectors understand the need to improve their water management standards and to take appropriate actions. Through the CDP Supply Chain Program, we request that suppliers respond each year. We provide feedback on supplier assessment results in order to enhance the overall level of the activities undertaken by each supplier.

Consumer behavior needs to change in order for consumers to attain the Kirei Lifestyle. We provide opportunities for consumers to think about the Kirei Lifestyle through visits to museums or plants on the subject of the water that all of them use daily. For example, the Kao Eco-Lab Museum has displays that vividly indicate the amount of water required for human needs.

# Water Conservation GRI 3-3, 303-1, 303-2, 303-5

## Risk management

In the process of assessing risks and opportunities, the Corporate Strategy Division examines risks and opportunities anticipated at Kao, and conducts risk and opportunity assessments based on feedback from outside experts and staff in internal departments that are implementing initiatives. These are approved by the Internal Control Committee and ESG Managing Committee, respectively.

On behalf of the Kao Group, the secretariat of the Risk & Crisis Management Committee (Risk Management & Responsible Care) conducts comprehensive and topical risk surveys on each division and subsidiary to identify key risks and adjust measures. In principle, the division in charge takes the lead in addressing these risks, but cross-organizational and common risks are addressed in collaboration with related divisions to strengthen the response and are treated as corporate risk issues as appropriate.

P280 Risk and Crisis Management > Governance > Education and promotion > Risk surveys

## Targets and metrics

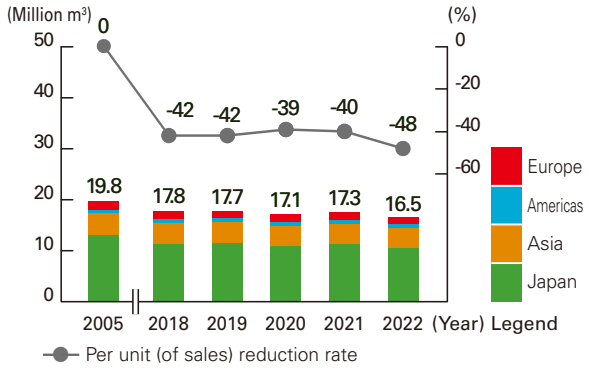
### Mid- to long-term targets and 2022 results

**2030 long-term targets**

| Item | Scope | Target for 2030 |
|---|---|---|
| **Water use (per unit of sales)** | **All Kao Group sites** | 45% reduction (compared to 2005) |
| | **Across the entire product lifecycle for the Kao Group** | 10% reduction (compared to 2017) |

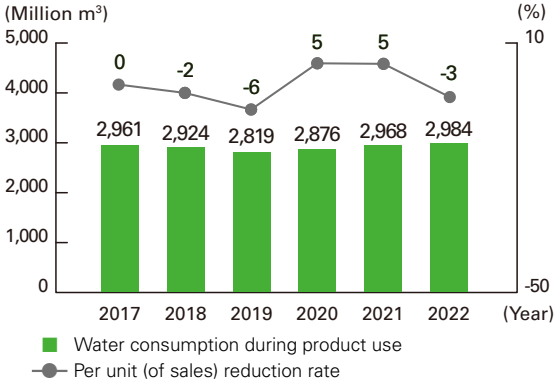
At all Kao Group sites, water-saving is promoted on a daily basis in all activities, including production, research and operations. Besides providing water-saving products that help to save water across the entire product lifecycle, we also seek to spread awareness of the importance of saving water to all of our stakeholders.

**Water consumption (withdrawal) ☑(all sites)**




* Boundary: For 2005, all Kao Group production sites and non-production sites in Japan. From 2016 all non-production sites are included.
* Assurance provided for water use (withdrawal)

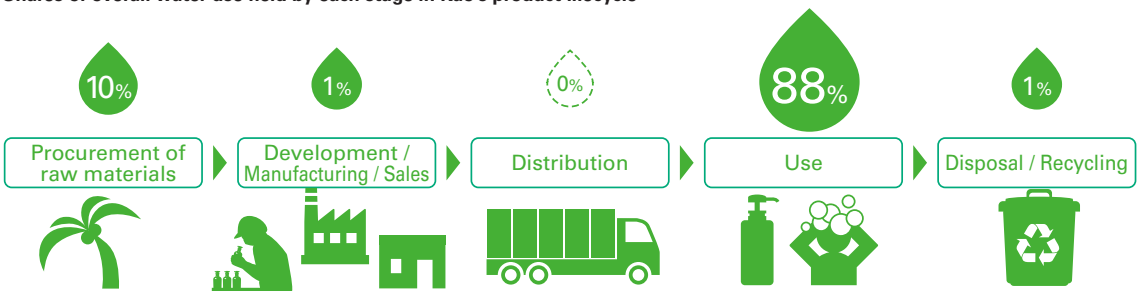
**Water consumption trends throughout the product life cycle ☑ (Kao Group)**




* "Water consumption throughout the product life cycle" is calculated as the combined total of the amount of lifecycle water use of individual products sold within and outside Japan (excluding use during production and distribution) multiplied by their annual sales quantity and the amount from the group's production and distribution processes. This amount includes water used for procurement in regard to Chemical products but does not include water used in the use and disposal of such products.
* Assurance provided for water use and per-unit (of sales) % reduction rate

# Water Conservation GRI 303-1, 303-2, 303-3, 303-4, 303-5

**Shares of overall water use held by each stage in Kao's product lifecycle**




### Water withdrawal amount by source (Million m³)* ☑(all sites)

| | 2020 | 2021 | 2022 |
|---|---|---|---|
| Surface water | 0 | 0 | 0 |
| Brackish water / seawater | 0 | 0 | 0 |
| Rainwater | 0 | 0 | 0 |
| Groundwater (renewable) | 5.1 | 5.4 | 5.4 |
| Groundwater (not renewable) | 0 | 0 | 0 |
| Oil-contaminated water / process water | 0 | 0 | 0 |
| City water | 11.8 | 11.9 | 11.1 |
| Wastewater from other organization | 0.1 | 0.01 | 0.03 |

Note: Boundary: All Kao Group sites

### Wastewater discharge by destination (Million m³)* ☑(all sites)

| | 2020 | 2021 | 2022 |
|---|---|---|---|
| Rivers / lakes | 2.7 | 2.9 | 2.8 |
| Brackish water / seawater | 5.7 | 5.7 | 5.0 |
| Groundwater | 0.0 | 0.0 | 0.0 |
| Sewage system | 2.8 | 2.9 | 2.7 |
| Wastewater to other organizations | 0.0 | 0.0 | 0.0 |
| Total | 11.2 | 11.4 | 10.5 |

Note: Boundary: All Kao Group sites

P110 Decarbonization > Targets and metrics > CDP evaluation

## Reviews of 2022 results

Our water consumption (all sites) came to 16.5 million m³, lower than in the previous year. As sales increased, the per-unit (of sales) reduction rate rose to 48%, which was an improvement compared to the previous year, and we achieved a reduction of 41%, well above the 2022 target. Water use at production sites with water intake risks came to 2.9 million m³.

Water use across the entire product lifecycle (for the Kao Group as a whole) rose by 16 million m³ year-on-year. The per-unit (of sales) % reduction in for water use across the entire product lifecycle was 3 percentage points lower than in 2017.

Water consumption increased throughout the product lifecycle due to increased sales of dishwashing detergents. On the other hand, unit water consumption decreased slightly due to the impact of increased sales of price pass-through from higher raw material prices.

The challenge is to reduce water use during the use stage. We are working to further expand our water-saving products.

# Water Conservation GRI 303-1, 303-2, 308-2

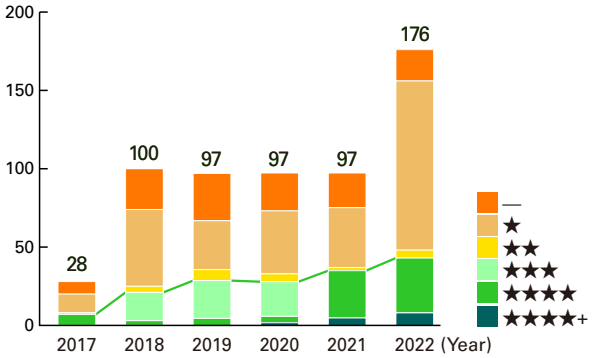
## Main initiatives

### Efforts in raw materials procurement

We began participating in the CDP Supply Chain Program in 2015 and we encourage suppliers in high water-risk sectors to work on improving their water management standards. More specifically, we ask suppliers to fill out the CDP questionnaire survey. We use our unique methods to evaluate suppliers' water management status, and we provide feedback on the evaluation results.

The 2021 survey results showed that the number of suppliers obtaining an evaluation of at least three stars had increased by eight compared to the previous year, indicating that the overall supplier activity level had risen. On the other hand, the number of companies with a one-star rating increased significantly with the addition of 79 newly surveyed companies. We will continue to promote engagement in order to achieve a rating of three stars or higher.

**Supplier activity level (Water)**




### Efforts in development, manufacturing and sales

#### Initiatives to reduce water use

We use water as a product ingredient as well as to clean and cool equipment at our plants. We set targets to reduce water use at each plant and are working to reduce consumption and increase recycling based on the 3Rs (reduce, reuse and recycle).

#### Reduce

Multiple plants, including Kao Chemicals Germany, conduct efforts to increase the number of times that water is reused for boilers and for cooling to reduce their water use.

#### Reuse

Rainwater is collected and used to water green spaces at the Sumida Office, Kao Chemical Corporation Shanghai, and Fatty Chemical (Malaysia) Sdn. Bhd.

#### Recycle

Active recycling efforts, such as recovering steam and treating and reusing water that has been used in production processes, are being carried out at many plants.

**Examples of 3R activities**

| Company name | Content |
|---|---|
| Kao Chemical Corporation Shanghai | Reduces its water use for the manufacturing of some products by reusing water from reaction processes of other products |
| Kao Vietnam Co., Ltd. | Introduced a spray technique for washing and sanitizing tanks, resulting in reducing its use of water and steam |
| Kao Industrial (Thailand) | Returns overflow equipment-cooling water to an equipment-cooling water pool to help eliminate unnecessary water use |
| Quimi-Kao, S.A. de C.V. (Mexico) | Concluded an agreement with the local community to receive treated water from the community's water purification plant. Reverse osmosis is employed to use sewerage effectively, and Quimi-Kao further purifies the treated water it has purchased and releases water left over from production into a river through the community's facility, thus contributing to local water recycling. |

### Climate change scenario analysis

It is reported that changes in the amount of rainfall and the rise in sea levels caused by climate change are not the same around the world, differing between regions. According to the RCP 8.5 scenario, future average annual rainfall will increase in high latitudes and Pacific Ocean equatorial regions, and will decrease in arid mid-latitudes and subtropical regions during the period from 2080 to 2100. According to that scenario, the global average sea level rise will be 0.71 m during that period, with a range from 0.51 m to 0.92 m, a substantial difference.

Accordingly, we assessed water risks caused by climate change at worksites, plants and distribution sites.

For the initial screening, we determined site conditions (primarily confirming nearby rivers, coastlines, elevations and so on from the perspective of

# Water Conservation GRI 303-1, 303-2

flooding and storm surges), performed checks using existing tools (Aqueduct, hazard maps, etc.) and checked past examples (floods and other natural disasters in the past). Next, we used climate models to compare heavy rain, light rain and storm surge risks with the current climate (1951–2011) at sites identified in the initial screening.

The results indicated that light rain will occur at all sites at about the same frequency as under the current climate, and that heavy rain and storm surges will occur more frequently at some sites, and flooding damage will be at about the same levels that we assumed until now.

There are several sites where a high level of drought risk is anticipated. We have been implementing quantitative evaluation of water resource risk in the drainage basins where these sites are located, using a methodology based on the CBWT method. The results confirmed that the evaluation method used was effective. We are continuing our sequential quantitative evaluation and have identified several plants that are at higher risk. Going forward, besides expanding the scope of evaluation to include more sites, we will be evaluating preventive measures to prevent latent risks from being actualized, and evaluating countermeasures that can be adopted if risks are actualized.

### Efforts during use

As water use in the product use stage accounts for around 90% of water use across the entire lifecycle, we are providing water-saving products and implementing consumer communication in regard to how to use these products properly.

In 2009, we launched *Attack Neo* laundry detergent, which enables washing to be completed properly with only one rinse cycle, in Japan. The year 2019 saw the launch of *Attack ZERO*, which combines superb cleaning power and odor removal capability with zero detergent residues. Our products for front-load washers, which use less water, can also be used with just one rinse cycle. Laundry detergents that require only one rinse cycle are now offered in Japan and Taiwan. We aim to make one rinse cycle the norm for clothes washing.

Through our Essential Research focused on foam, we have also succeeded in reducing the amount of water used when rinsing with other product categories too. In 2010 we launched *Merit Shampoo*, which uses 20% less water for rinsing than conventional products, followed in 2014 by *CuCute* dishwashing detergent, which also reduces the amount of water needed for rinsing by 20%, and in 2015 by *Magiclean Bathroom* bathroom cleaning liquid, which uses 10% less water for rinsing. We plan to continue rolling out new water-saving products based on our Essential Research.

We also communicate ways to save water to consumers using a variety of approaches. For example, we have developed ecology shampoo techniques to use less water when shampooing hair, and we communicate these to consumers. Communicating ways to conserve water while offering water-saving products truly embodies "eco together," the slogan of the Kao Environmental Statement.

### Implementing education and activities based on "eco together"

**Employees**

- In regard to employee education based on Responsible Care (RC) activities, we implement relevant education for all employees.
- We implement relevant education for all employees working at applicable worksites at plants and research institutes that have secured ISO 14001 certification.
- We hold guided tours of the Kao Eco-Lab Museum for our employees. (We have been conducting online tours for employees to prevent the spread of the COVID-19 pandemic.)

**Customers**

- We exhibit on water conservation at the Kao Eco-Lab Museum. (We have suspended tours for the general public to prevent the spread of COVID-19. Instead, we provided explanations about our lives and water through online tours for elementary school students.)

**Business partners**

- We hold the Kao Vender Summit for important suppliers.
- We asked suppliers to complete the CDP questionnaire survey.

**Local communities**

- Many plants prepare annual environmental reports and communicate with local residents.

**National and local governments**

- We conduct a water conservation campaign in China.
- We participated in the Water Project conducted by the Ministry of the Environment of Japan.

**Participation in China's Nationwide Cleanliness and Water-saving Initiatives water conservation campaign for ten consecutive years**

Kao (China) has conducted the Nationwide Cleanliness and Water-saving Initiatives jointly with the Center for

# Water Conservation

Environmental Education and Communications of Ministry of Ecology and Environment, since 2012.

Until now, we focused mainly on water conservation as an activity to draw the attention of university students and the general public in China to water conservation. Starting in 2020, we have increased the number of activity themes, and in 2022 we partnered with the Advertising and Education Center of China's Ministry of Ecology and Environment to launch a new campaign theme, "Towards a Clean and Beautiful China." With the new launch, the campaign continues to focus on university students, soliciting activity proposals from universities around China on various environmental themes such as "plastic reduction," "decarbonization," "biodiversity," and "sustainable development," and supporting the implementation of selected proposals and public relations activities of the universities. Further focus on the strategic direction of environmental priorities in China will integrate the Kao Group's strategies and practices in environmental protection. And we hope that university students will develop more diverse activities, deepen their thinking on environmental issues, and generate innovative ideas for environmental activities.

This campaign combines "online + offline" activities. The national small grants program and mini-programs for universities have been launched. To date, 154 university associations have submitted proposals.

After the application deadline, finalist projects will be implemented with the support of the Publicity and Education Center of the Ministry of Ecology and Environment and Kao China.

## Employees' opinions

### Through the development of skin-friendly cleansing agents

**Asuka Tomikawa**
Skin Care Research Laboratory

At the Skin Care Research Laboratory, we continue to develop cleansers that simultaneously meet the dual goals of "properly removing dirt and relieving the skin of various irritations caused by dirt" and "minimizing the effects of cleansing on the skin (such as lowering the barrier function of the stratum corneum)."

*Bioré u Body Wash Foam-Type* is characterized by the fact that a fine white foam, like whipped cream, comes out just by pressing the pump, which allows anyone to wash their body easily and without friction. We have explored the concept of "not over-washing" to create products that are more comfortable on the skin and give people a more positive user experience.

When calculating the amount of water used when washing the body, it has been found that water use can be reduced by 12% when washing the body by hand compared to using sponges or other objects (from a web survey, when the water is turned off during foaming and washing). If customer use a liquid-type body wash after foaming it up with a nylon towel or other object, customer will need water not only to rinse off your body but also to rinse the towel. We believe that washing the body by hand is gentle on the skin, frictionless, and saves water by reducing the amount of water needed to rinse objects.

We will continue our research to deliver products that are more friendly to people and the environment and that enable anyone to wash their body with the great feeling that comes from great foam.

# Water Conservation

## Stakeholder engagement

**Norihiro Itsubo**
Professor,
Faculty of Science and Engineering,
Waseda University

**Kao's response to the views expressed last year**

Taking into account the suggestions that we received last year, we are continuing to develop products that will be useful in drought areas and in times of disaster. We can expect to take advantage of *Space Laundry Sheet* and *3D Space Shampoo Sheet*, which have been used in the International Space Station (ISS), not only in space but also in times of disaster, during hospital admissions, and in water-scarce countries and regions. As in the previous year, we have placed *Bioré u Body Wash* on the market for its expected water-conservation capabilities with its foaming property. We will continue to develop water-saving products.

Every year, Kao analyzes water consumption through its entire value chain. The total amount used is approximately three billion cubic meters, or about four percent of all water used in Japan per year, which is approximately 80 billion cubic meters. This is a substantial figure for just one company, which is why expectations are high for how much Kao can contribute to the environment.

I would like to point out two things we expect of Kao. One is to help solve water problems in developing countries, which is a social issue in those countries. In fact, 1.6 billion people lack access to safe drinking water, 2.8 billion do not have sewage systems, and 1.9 billion have no access to any facilities to wash their hands. No safe drinking water means that people must spend many hours a day to get water. If sewage systems are not available, women and girls feel reluctant to go to school. And a lack of hand-washing facilities dramatically increases the risk of catching infectious diseases such as COVID. Some 10 percent of the water used throughout Kao's value chain, or 300 million cubic meters, is for procuring raw materials. Much of it comes from water sources in developing countries, for purposes such as producing palm oil, which means we are indirectly affecting how developing countries source their water. So how will Kao secure its water sources through collaborations with farms and municipalities of the producing nations, and improve the quality of its wastewater? The hope is that projects to solve education and gender issues will be generated through solving water problems in developing countries.

The other expectation related to development of DX. Changing consumer behavior will be key for effectively reducing water stress—this is obvious, as about 90 percent of water consumed in Kao's value chain is used in the consumption phase. For energy, many energy-saving projects have emerged through visualization such as HEMS and with the use of nudging and the like. As for water, although some attempts have been made to save water, there are expectations that data-driven activities will modify consumer behavior through the use of technologies such as smart meters. I once worked together with Kao to compare and analyze environmental performance between refill-type packaging and replacement-type packaging by monitoring how consumers used them. I recall that the results were published in an international journal and played some part in spreading the current replacement-type products through the market. In today's world, copious amounts of monitored data need to be obtained and applied in many ways, and I would like to see Kao become an information platformer to solve water problems.

Currently, LCA, which is used to evaluate the environmental impact of a product's lifecycle, is beginning to transform into an assessment method that covers both the environment and society, including social LCA. And it is a wish of mine for Kao to develop further as an ESG-leader by applying environmental and social LCA to help resolve water issues both in Japan and abroad.