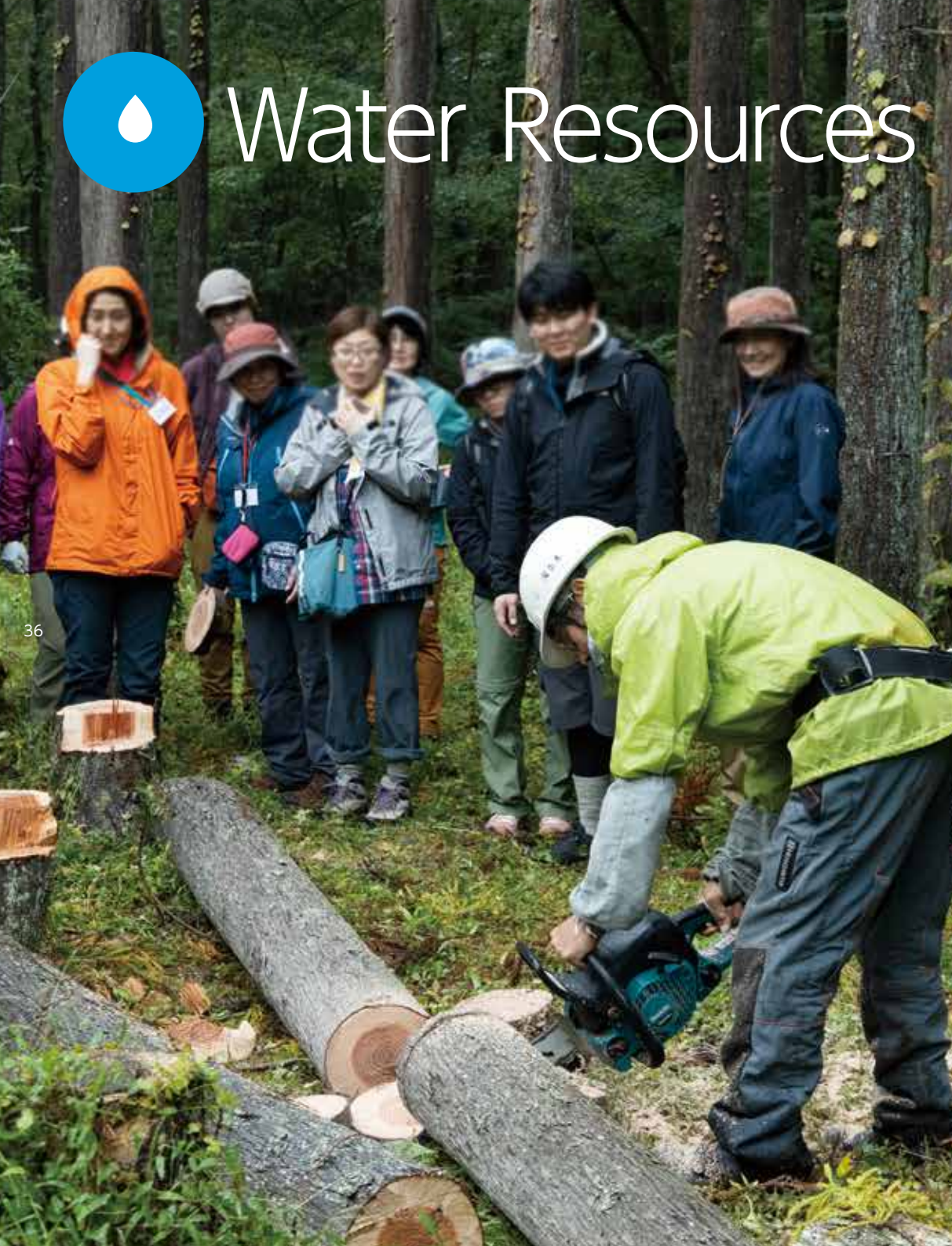




Water Resources



We will create together

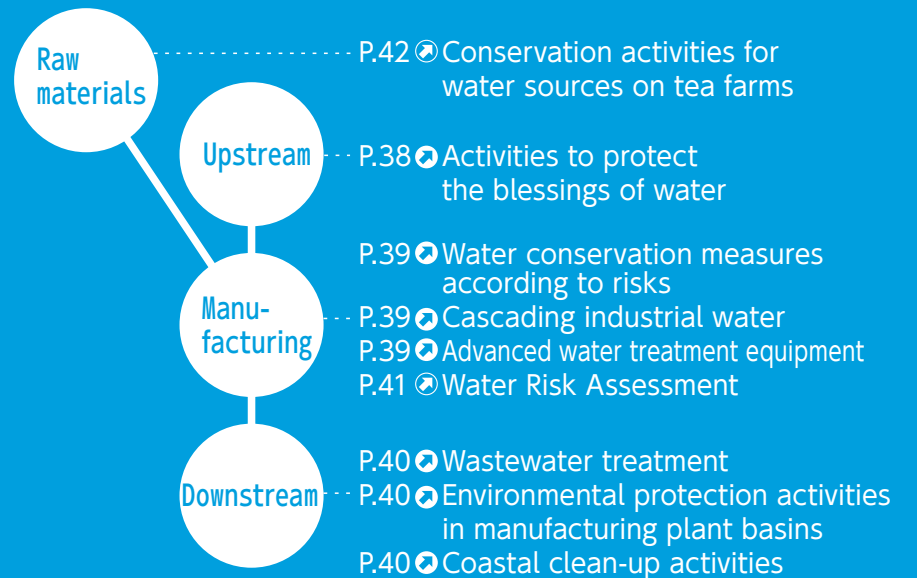
A society that values sustainable water resources

Bring water, used as a raw material, to a sustainable state

Solve problems with water in a way that suits the characteristics of basin regions where our business bases are located

Basic Thinking

For the Kirin Group, as well as being a basic raw material, water is also an essential resource in growing the agricultural products that are our ingredients. In addition, water is an indispensable resource for washing our production equipment. However, our scenario analysis based on the TCFD recommendations shows that water resources in the locations and basins of our business sites and in raw material production regions are significantly affected by climate change. The Kirin Group recognizes that water resources are shared resources and are closely related to the society, culture, and human rights of people living in basins. We are also aware that water resources are unevenly distributed around the earth, and different countries and regions have different risks associated with water. With this recognition, we are taking appropriate measures based on the circumstances of each region.

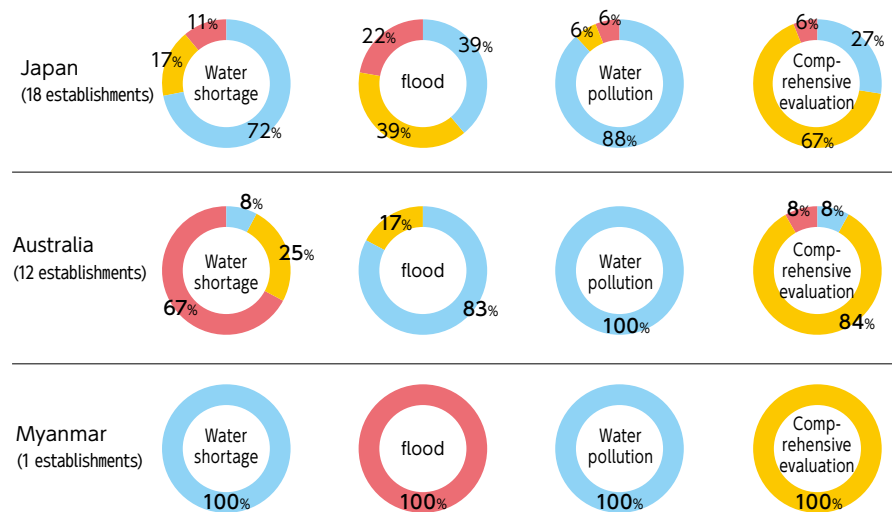


Overview of Approaches

The Kirin Group has been continuously working to achieve sustainable use of water resources through such measures as major water savings by using a cascading system of water use and installing advanced industrial water treatment equipment. We are also continuing to lead the industry in forest conservation activities to protect water sources at our breweries in Japan. Kirin Brewery has reduced its water consumption rate by approximately 50% compared to 1990 levels, and has achieved the world's highest level of water conservation in Australia, where water stress is high. At the same time, we have long understood that water resource issues vary from country to country and region. In 2014, we identified the amount of water used in the upstream of our value chain and conducted water risk surveys at our global business sites. The results were disclosed in 2015. Subsequently, in 2017, we conducted water risk assessments in the basins that the Kirin Group's 44 business locations in nine countries rely on, and in the production regions of our major agricultural ingredients. In 2019, we identified water risks in greater detail in major agricultural production regions as part of our scenario analysis. The Kirin Group's new long-term strategy called Environmental Vision 2050, announced this year, calls for solving problems with water in a way that suits the characteristics of basin regions where our business bases are located. Already, in 2018, we began water source conservation activities in Sri Lankan tea farms as well as providing education programs to residents in basins there about the importance of water. We are also considering expanding these initiatives to other raw material production regions.

Related Information→P.94~P.95

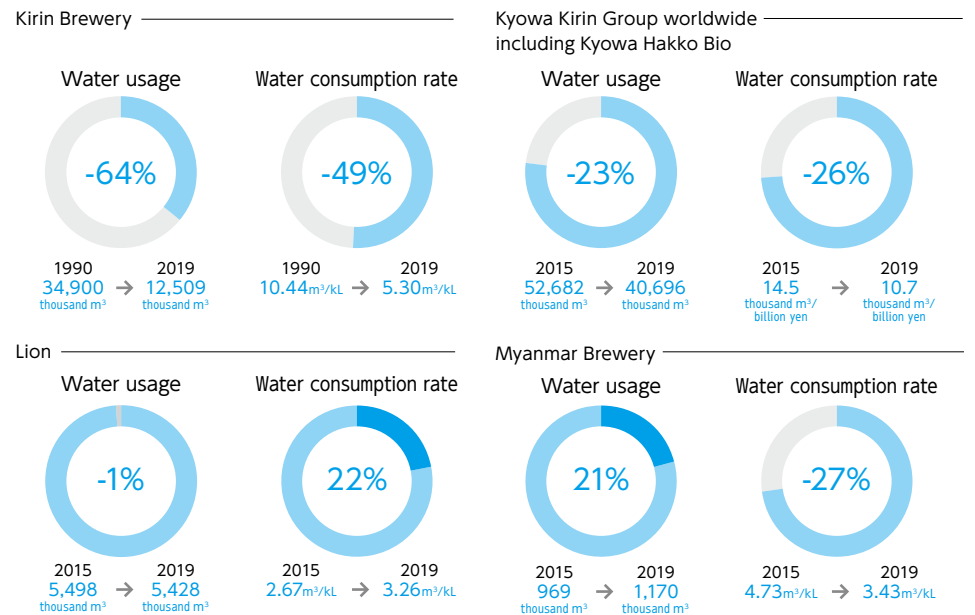
Business Location Water Risk Assessment Degree of risk Low Medium High



Highlights of Outcomes

Challenges	Progress
Bring water, used as a raw material, to a sustainable state	In 2019, Kirin Brewery reduced its industrial water usage use by 64% and its water consumption rate by 49% compared to 1990 levels. The same year, the Kyowa Kirin Group worldwide including Kyowa Hakko Bio reduced its industrial water usage by 23% and its water consumption rate by 26% compared to 2015 levels. Although Myanmar Brewery's industrial water usage rose by 21% compared to 2015 in 2019, its water consumption rate fell by 25%. We continued our Water Source Forestation Activities in 12 locations across Japan, with 1,192 people participating.
Solve problems with water in a way that suits the characteristics of basin regions where our business bases are located	In 2018, we began activities to conserve water sources in tea farms in Sri Lanka. Water sources in highlands are the source of many rivers in coastal cities, making our activities important for all surrounding basins. In Japan, we were able to minimize the impact of Typhoon Faxai and Typhoon Hagibis in 2019, despite the severe damages they inflicted on the country, because we had been quick to prepare a counter-disaster manual based on the lessons learned from our previous experience with the disruption of the distribution networks caused by the 2018 West Japan Torrential Rain Disaster. Furthermore, in 2019, we proceeded with our efforts as part of the scenario analysis to identify water risks and water stresses in major raw material production regions in more detail.

Progress



Bring water, used as a raw material, to a sustainable state

Water sources

Activities to protect the blessings of water

Our Water Source Forestation Activities, which began as an activity to protect the water sources of our manufacturing plants, began in the forest of the Tanzawa district of Kanagawa Prefecture, which is the water source for Kirin Brewery Yokohama Plant in 1999. This initiative, which was a pioneering initiative in the industry, has since been adopted in 12 locations across Japan. Under medium and long-term agreements with the local governments and other relevant parties that manage the water source forests, the program includes tree planting, undergrowth cutting, pruning, and thinning. Today, many of the forests are bright, luxuriant forests. In some locations, some of our customers have volunteered to take part in the activities. In 2019, 1,192 people took part in activities for a total of 15 times.



Kirin Kiso-river water source forest



Special tour to encounter forests and water

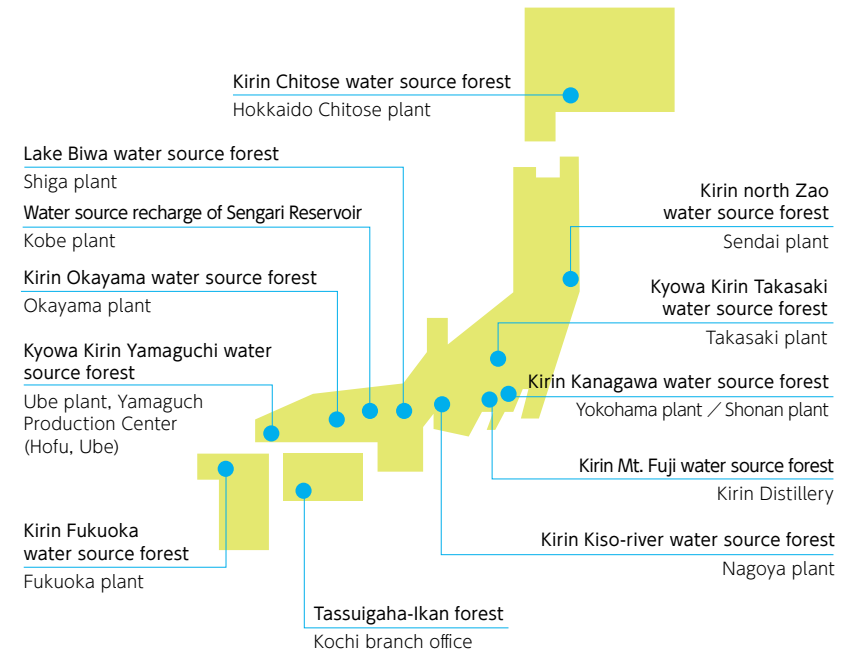
Kirin Distillery has conducted a special tour, called "Water and Forests Classroom" twice a year or so since 2014, in conjunction with the magazine, Randonnée. This initiative gives participants the opportunity to develop a better understanding about the forests and water.

Voices of Stakeholder

Forest creation consists of planting, protection and nurturing, and taking advantage of resources. Teaching people who live in cities about forests through cutting work, and giving them hands-on experiences of making things from the thinned wood - all of these things lead to forest creation. We work with the Kirin Group on the Water and Forests Classroom, a reader-participation activity sponsored by Randonnée magazine, and other activities. With the aim of forest creation that anyone can participate in, we will continue to cooperate with the Kirin Group in the pursuit of our activities.

Tsuchi ni Kaeru Ki Forestation Society (NPO)

Kirin's forest across the country



Actual records of Water Source Forestation Activities in FY2019

Number of implementations	Number of participants	Locations
15	1,192	11

Manufacturing

Water conservation measures according to risks

Reducing the amount of water used in manufacturing plants is a major challenge. The Kirin Group has pursued water conservation through recycling and others in addition to initiatives such as using water only when and as much as needed. Meanwhile, focusing on the water risks in the basin regions around our manufacturing plants, we have conducted surveys to identify the degree of risk and are installing and operating water-saving equipment according to the level of risk.



CIP equipment



External washer

Cascading industrial water

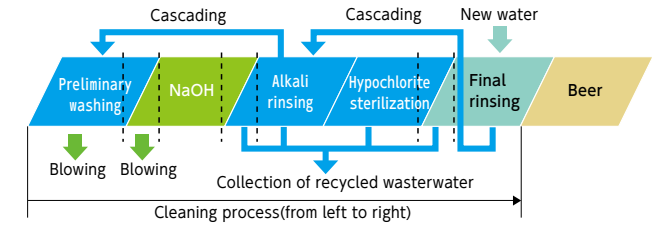
Much of the water used in manufacturing plants is used for washing and sterilizing processes of equipment and pipes. In addition to the establishment of frameworks and mechanisms for the confirmation and assurance, from a quality perspective, that washing is being performed, water flow rate and velocity are strictly controlled to ensure that water is not wasted. We also actively pursue the re-use of water, depending on the purpose. Specifically, the rinsing water used in the final step of the pipe and equipment washing process is still relatively clear, so it can be used again for the initial process of pipe washing. In this way, we have implemented a cascading system of water use that repeatedly uses water that has been used in washing, according to the quality of the water. In actuality, considerable knowledge on how to use this equipment is needed to achieve the right volume balance of recoverable water and water used and the timing of recovery and use, and to guarantee that the equipment and pipes are being washed properly.

The Kirin Group is achieving a high level of water conservation by sharing various know-how and ideas, giving feedbacks on outcomes and taking other steps for improvement, thereby accumulating such know-how and ideas as technologies.

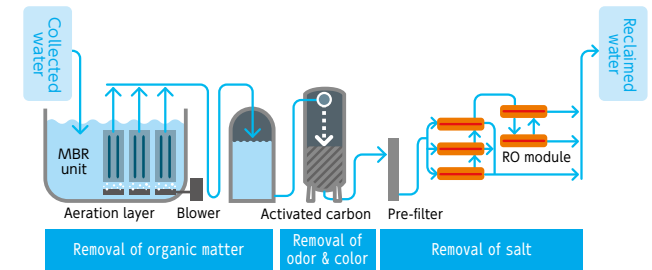
Advanced water treatment equipment

Lion is committed to exploring innovative ways to improve water management within the communities it operates. In 2009, Lion commissioned a water recycling plant for its Castlemaine Perkins Brewery – setting out to halve the water used in brewing their classic brand, XXXX Gold. A decade on, the brewery is approaching world class standards in water management and is continually pushing the boundaries of conservation. The two main uses for water in brewing are water used in making the beer itself – plus water used in the brewing process, which is

Cascading rinse water for washing tanks



Flow of sophisticated water processing facility at the Kobe Plant



used in non-product related processes, such as cleaning, cooling and pasteurising. In 2009, Lion partnered with the Queensland Government to install a reverse osmosis plant, to recover waste water and minimise our reliance on mains-fed town water. In 2019, the plant generated more than 240 million liters, the equivalent of 96 Olympic-sized swimming pools. On average the brewery recycled approximately 4.7 million liters of water per week in 2019. Vitally, the plant enables XXXX Gold to be produced at a ratio of 2.5 liters of water for every liter of beer produced – which is approaching world class levels of water efficiency. This technology is being shared within the Kirin Group, and is now in use at Kirin Brewery's Kobe Plant.

Wastewater

Wastewater treatment

It is our obligation as a company that uses water as a raw material to ensure that our wastewater is returned to nature in pristine condition. In the Kirin Group, the water that we have finished using is purified to voluntary standards that are stricter than those required by law, before being released into rivers and sewers.

State of wastewater →P.95

State of wastewater quality→P.101

In the anaerobic treatment process used to treat wastewater, a biogas, with methane gas as its main constituent, is obtained. This gas is used to generate electricity at boilers and co-generation systems.

This is a renewable energy derived from plant-based raw materials, such as malt, so is a CO₂-free energy.

State of wastewater biogas→P.64

Environmental protection activities in basin regions around manufacturing plants

The various manufacturing plants of the Kirin Group are conducting a range of environmental protection activities, particularly riverside clean-up activities in cooperation with local governments and NGOs.

The Kirin Brewery Yokohama Plant, in cooperation with an NPO, Tsurumi River Basin Networking, continues to conduct beautification campaigns at nearby Tsurumi River, Living Species Observation Events and others.

Kirin Brewery, Kirin Beverage, Mercian, Kyowa Kirin, and Koivai Dairy Products are also engaged in local environmental beautification and environmental protection activities, focusing on the rivers they draw water from and other nearby rivers.



Environmental protection activity in Tsurumi River basin regions

Coastal clean-up activities

A group of 36 people, consisting of employees of Mercian's Fujisawa Plant and their families, participated in the 43rd Zero Trash Clean Campaign - Beach Clean Up Kanagawa 2019, a clean-up activity on the Katase Coast in Fujisawa hosted by the Fujisawa City and the Kanagawa Coastal Environmental Foundation in May 26, 2019. The Plant supports the goals of this initiative, namely to "conduct a clean campaign to protect the beautiful natural surrounds of the Katase Coast, so that the beaches can be widely loved as a place of rest and relaxation for all," and participates in the campaign every year. It will continue to widen the circle of volunteers, to take care not to discard trash and call on everyone to be involved in the beautification of the environment on the Katase Coast.



Clean-up activity on Katase Coast in Fujisawa

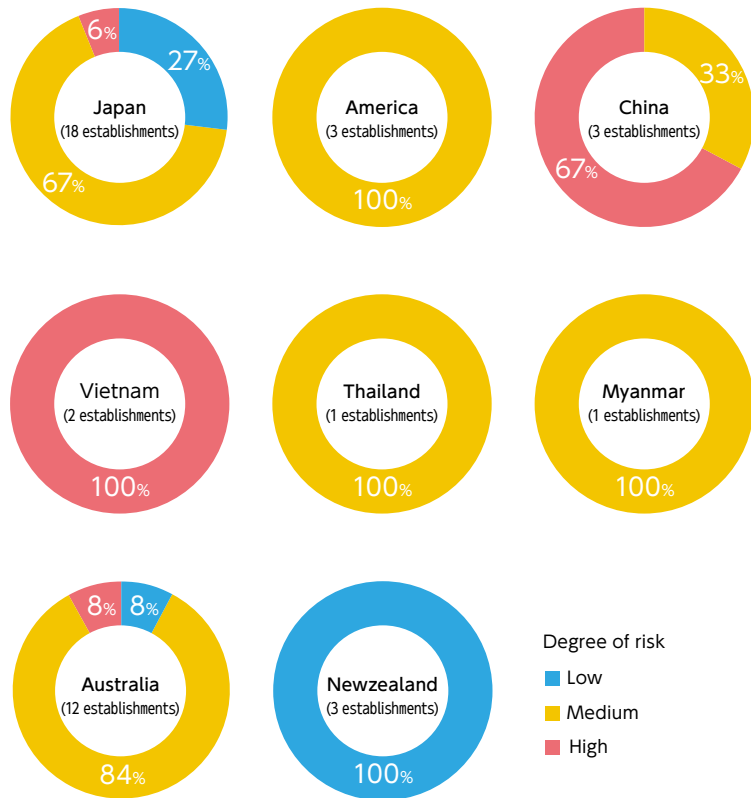
Solve problems with water in a way that suits the characteristics of basin regions where our business bases are located

Water Risk Assessment

The results of the water risk assessment of Kirin Group business locations and the value chain water risk assessment conducted in 2017 are as follows. For the assessment, we used WRI Aqueduct and WWF-DEG Water RiskFilter to simplify the surveys, and took information published by administrations, etc. into consideration.

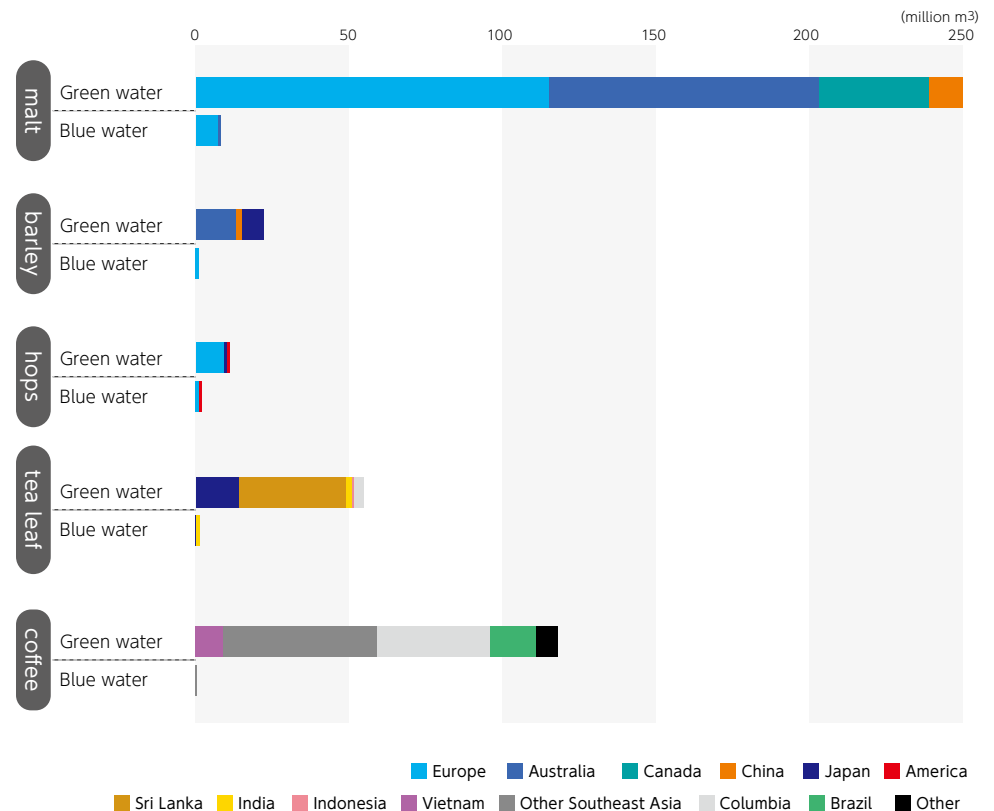
Forty-four major production sites in Japan, the United States, China, Thailand, Vietnam, Myanmar, Australia, and New Zealand were surveyed.

Business Location



Raw materials

Water use by raw material and country



Conservation activities for water sources on raw material production areas

Conservation activities for water sources on tea farms

In the assessment of water risks in the value chain conducted in 2017 and the scenario analysis conducted in 2019, it has become evident that climate change will cause water stress and flood risks to increase in ingredient agricultural production regions in the future. However, it is not easy to respond to water resource issues in the upstream of the value chain. Therefore, the Kirin Group decided to address this issue beginning with Sri Lanka, where we have been providing assistance for obtaining sustainable tea farm certification, and where we have developed strong partnerships with local tea farms and NGOs. In the tea farms on the Sri Lanka highlands, there are many areas where the tea bushes are planted on steep slopes. The rain, instead of penetrating into soil, flows straight down such slopes which as a result are believed to have lower water source cultivation function compared to that of the mountains and hills where native forest remains.

However, in places with good conditions of soil beds and others, rain that falls near the summit and on the tea farm penetrates the ground, and numerous springs gush up in sections of the tea farm.

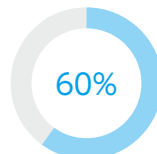


Tea bushes planted on steep slopes

These places are known as micro watersheds. Micro watersheds on tea farms can be found in the highlands of central Sri Lanka, and, in almost all cases, they are headstreams of rivers flowing through coastal cities. For this reason, while they occupy only a tiny area, they are very precious water sources.

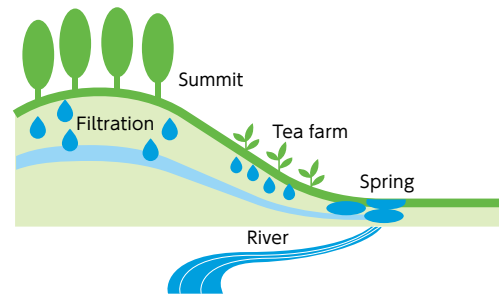
In this initiative, five micro watersheds are selected from tea farms that we have assisted to obtain certification, and we will fence off these micro watersheds to protect them from being used for other purposes. Also, with the objective of bringing vegetation

Conservation of tea farm water sources
5 locations (2020)



3 places

Mechanism of micro watersheds



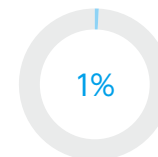
diversity to single-cropping tea farms, we intend to plant native and endemic species of trees around the micro watersheds. This also serves to ensure that soil that flows down the slopes during torrential rainfall does not flow into the water shed.

Education programs for valuing water

Due to the history of Sri Lankan tea farms, going back to when the plantations were first established, many people still live on the vast tea farms who make a living by doing work that has nothing to do with the tea farms themselves. These residents have been generally allowed to use empty plots that are not being used to grow tea for their living. For this reason, there have been cases in which these residents, not recognizing the water sources, which are called micro watersheds, as water sources, have converted those areas to vegetable patches or grazing pasture, or have cut down the trees around the watersheds for firewood. Therefore, in order to protect the water sources, instead of merely fencing off to keep the tea farms' residents away, there is a need to educate them that those areas are the water sources we should protect.

In this initiative, we plan on conducting an education program to teach the approximately 15,000 residents living in the vicinity

Target number of residents in the education program to learn about the importance of water
15,000 (2020)



150 persons



A micro watershed surrounded fenced off



A stream inside a tea farm

of these five water sources about the importance of water and about what kind of functions micro watersheds have. Furthermore, at some farms, efforts are made to incorporate our educational programs as part of the curriculums of day care centers and elementary schools attended by children of tea-picking workers.

In the future, we will also consider offering support on water risks to other raw material production regions.

Contribution to water-efficient agriculture

The bag-type culture vessel system technology Kirin developed for the practical application of mass plant propagation technology is expected to be applied to water-efficient agriculture.

With the resin film-based bag-type culture vessel system, a solution containing nutrients necessary for plant growth is aerated inside a small bag to allow plants to grow, making it easier to use water more effectively than in soil cultivation. Therefore, this system may be applied to cultivation in dry areas, for example.

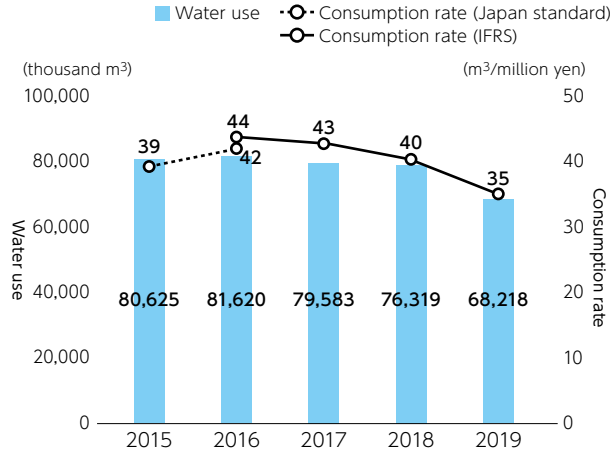
We will continue to apply this mass plant propagation technology as a means to solve various social issues.

Mass plant propagation technology → P.28

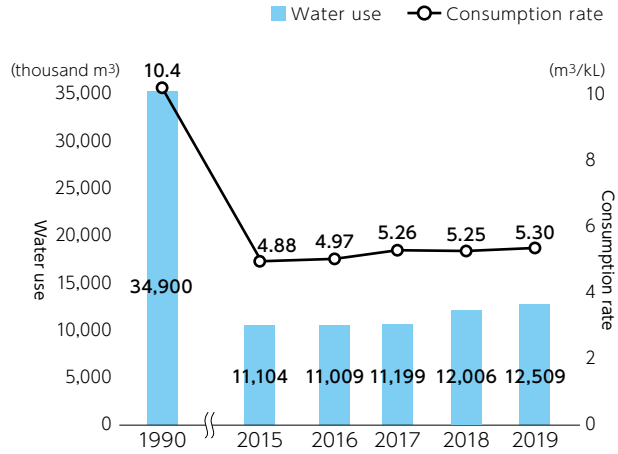
Water Graphs

Related Information→P.94~P.95

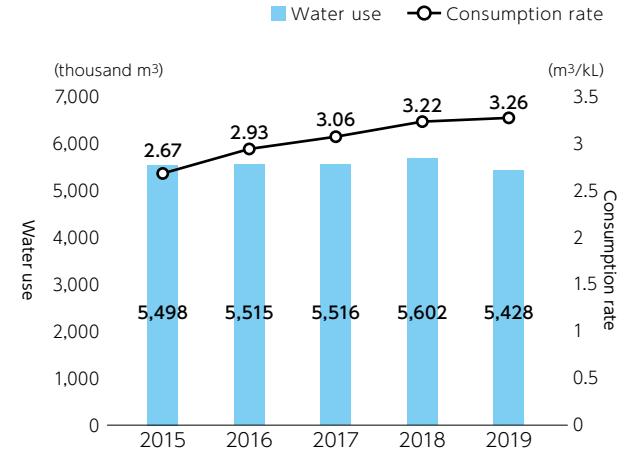
Water use and consumption rate (water use/sales revenue) of entire Group



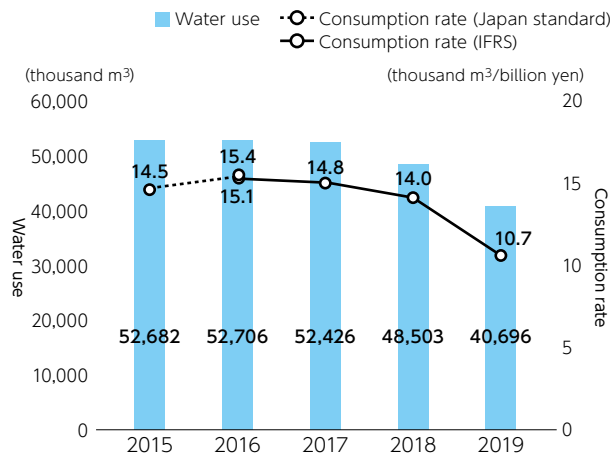
Water use and consumption rate (water use/production volume) of Kirin Brewery



Water use and consumption rate (water use/production volume) of Lion



Water use and consumption rate (water use/sales revenue) of Kyowa Kirin Group worldwide including Kyowa Hakko Bio



Cyclical water use and cyclical use ratio (cyclical use/(tap water use + cyclical use)) of entire Group

