

CDP Japan Water Security Report 2018

On behalf of 655 investors with assets of US\$87 trillion



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Now is the time for businesses to ramp up action and send a clear signal to governments that they need policy ambition to match. Business as usual is no longer an option, but a prosperous and sustainable water secure future is achievable, if we choose to rise to the challenge.

Water is the life blood of our global economy. It is a fundamental necessity for lives and livelihoods; for economic prosperity, health and development, and environmental sustainability. Yet this vital resource is still undervalued.

Last year, the UN reported that the world is not on track to meet its goal of ensuring the availability and sustainable management of water and sanitation for all. In fact, water crises continue to be rated as a top global risk based on both severity and likelihood by the World Economic Forum's Global Risks Report.

Meanwhile, a warming world continues to put our water supplies at risk. The landmark report from the Intergovernmental Panel on Climate Change (IPCC) showed us that limiting warming to below 1.5C would see the global population's exposure to water stress lowered by 50% compared to a 2C scenario. Yet, the world continues heading beyond this guardrail.

We all face a choice: seize the opportunities of the transition to a stable climate and a water secure future, or continue business as usual and face untold risks.

At CDP, we are encouraged to see that more and more investors and companies are stepping up their engagement with water security. Ten years ago, when CDP's water security questionnaire was launched, water disclosure was non-existent in capital markets.

Last year, 2,111 companies, worth more than US\$18 trillion in market capitalization disclosed water information through our platform. Environmental disclosure has become mainstream. The FSB's Task Force on Climate-related Financial Disclosure (TCFD), which built on the work of CDP, has paved the way for mandatory climate-related disclosures across G20 countries over time. For example, China is moving towards mandatory environmental disclosure for its stock exchanges by 2020.¹ With the Dutch central bank recently warning that the Dutch financial sector's exposure to the most water-scarce regions totals EUR 97 billion², we anticipate non-financial reporting requirements to evolve swiftly beyond solely carbon and climate.

As we have long believed, where there is greater measurement and transparency, greater action follows. Leaders from across the worlds of business and finance are taking the urgent steps required to build a sustainable future for all. We are seeing progress in the right direction, from the companies participating in early efforts to set Context-based Water targets; to those seizing opportunities for new water-smart products; and the investors shifting their investments in support of a water-secure future.

Last year, a new index from Euronext became the first globally to base its selection on how companies perform on water security, climate change, and deforestation. Meanwhile, German Chemicals company Symrise AG now ties 10% of its C-suite bonuses to achieving corporate sustainability targets, including strategic water-related targets, and Reckitt Benckiser has committed to deriving a third of its net revenue from 'more sustainable' products by 2020. An innovation that results in a product reducing its water impact by more than 10% per use is classified as a 'sustainable product'.

These are important and timely reminders of the progress we are seeing across the real economy. But there are still serious hurdles in the race to achieve Sustainable Development Goal (SDG) 6 on water and sanitation. In October 2018, Brazil elected a president whose policies threaten the future of the Amazon rainforest, a vital source and filter of water for Brazil. In the US, President Trump dismantled the Clean Water Act at a time when US states are being urged to issue more bonds and loan guarantees to help finance water infrastructure.³

Meanwhile, the extremes brought about by climate change continue to hit our global water supplies. From a Europe-wide heatwave to record droughts in Cape Town, and extreme flooding in Japan, these events brought significant costs in 2018, and put already stressed infrastructure and global commodities under greater risk.

We know that business is key in enabling the global economy to achieve – and exceed – its water goals, but achieving SDG 6 will require a complete transformation of our global economy. It will mean unprecedented co-operative action from companies, investors, cities, states and government across all sectors.

There is no time for complacency. Now is the time for businesses to ramp up action and send a clear signal to governments that they need policy ambition to match. Business as usual is no longer an option, but a prosperous and sustainable water secure future is achievable, if we choose to rise to the challenge. We must, we can and I believe we will.

Paul Simpson
CEO, CDP

¹ <http://www.chinawaterrisk.org/notices/new-cwr-report-china-prioritises-environment-more-disclosure-needed-to-match-rising-risks/>

² https://www.dnb.nl/en/binaries/Values%20at%20Risk%20-%20Sustainability%20Risks%20and%20Goals%20in%20the%20Dutch_tcm47-381617.pdf?2019012915

³ https://www.environmental-finance.com/content/news/us-states-urged-to-issue-more-bonds-to-support-water-projects.html?utm_source=180518&utm_medium=email&utm_campaign=alert

Message from QUICK ESG Research Center



CDP's water security questionnaire is designed to guide corporates through the challenges posed by worsening water security while helping investors better understand how their portfolio companies are addressing their water impacts and associated risks and opportunities.

According to the recently released World Economic Forum's "Global Risks Report", ahead of its annual meeting in Davos, the 'water crises' was ranked in the top 5 risks in terms of impact to global society within the next 10 years. This is the 8th consecutive year in which the water crisis has featured in the top 5 risks, highlighting the attention needed from the business community.⁴

The report explains that the water crises represents 'a significant decline in the available quality and quantity of fresh water, resulting in harmful effects on human health and/or economic activity'. However, water issues are much more multifaceted than this as they are linked to many of the other risks cited such as extreme weather, natural disasters and human rights.

With forests covering two thirds of its land area and numerous rivers and lakes found throughout the country, Japanese people take such natural riches for granted and are not highly aware of such 'water crises' referenced in the Global Risks Report. Nevertheless, Japan faces a significant risk in terms of natural disasters, namely typhoons and floods, driven by worsening climate change. According to the materials published by The General Insurance Association of Japan on 20th December 2018, the total payment amount of insurance claims for natural disasters in FY2018 reached JPY1.1757 trillion.⁵ It proves how vulnerable Japan is to water risk associated with climate change.

Recognizing the systemic risk that the water crises poses is an increase in investor interest and action. Nowadays, not only overseas investors, but more Japanese investors are beginning to incorporate ESG issues into their investment decisions and are taking action.

QUICK ESG Research Center conducted an interview with Sumitomo Mitsui Trust Asset Management Co., Ltd. to find out how they deal with water issues. Sumitomo Mitsui Trust Asset Management Co., Ltd. is a signatory to CDP's water program and acts as a lead manager at Principles for Responsible Investment's Water working group to encourage engagement activities with both overseas and domestic companies.

The company has chosen 'issues related to water resource and marine pollution' as one of their main engagement themes and requires the involvement of top level management from companies to take a comprehensive approach to water management, including their supply chain. The investor also pays particular attention to corporate responses to CDP's water security questionnaire to assess the maturity of corporate governance within a company in relation to water and pushes for C-suite management of water issues.

'Governance' is also one of the recommendations of the TCFD (Task Force on Climate related Financial Disclosures) around four thematic areas that highlights the important function of the board of directors and the role fulfilled by management in this regard. Accordingly, CDP has revised its questionnaires to reflect the TCFD recommendations since FY2018. CDP's water security questionnaire is designed to guide corporates through the challenges posed by worsening water security while helping investors better understand how their portfolio companies are addressing their water impacts and associated risks and opportunities.

QUICK ESG Research Center, as a Gold data provider as well as a scoring and a reporting partner of CDP, will extend our continuous support to customers for their understanding of environmental issues, including the establishment /implementation /assessment of their strategies and the development of their CDP response.

Etsuya Hirose

QUICK Corp.

Senior Executive Officer, Head of Business

⁴ World Economic Forum, The Global Risks Report 2019 14th Edition, (p6, http://www3.weforum.org/docs/WEF_Global_Risks_Report_2019.pdf, as of January 21, 2019)

⁵ General Insurance Association of Japan, (http://www.sonpo.or.jp/news/release/2018/1812_06.html, as of January 21, 2019)



Before the launch of CDP's Water Security Program, the means for investors and other company stakeholders to understand individual companies' water risks were very limited. CDP's Water Security Program has now become a valuable source of information for institutional investors to obtain an understanding of companies' water-related risks and opportunities.

In 2018, many areas including Ukraine and Cape Town, South Africa, suffered from severe droughts, while countless other parts of the world, including Japan and Kerala, India, were hit by floods. While the freshwater resources available to us are finite, many factors, including population growth, economic growth, and changes in consumer tastes and consumption patterns are expected to boost the demand for freshwater worldwide in future. Another concern is that shifting rainfall patterns due to climate change, together with spreading urbanization and changes in land uses, make many areas more prone to floods. It can be said that in the words of Mr. Peter Bakker, CEO of the World Business Council for Sustainable Development (WBCSD), the "planet is screaming at us, and the language it uses is water."⁶

Freshwater resources are essential for many companies to produce products and for the production of the raw materials they procure, therefore, a widening gap between freshwater demand and supply will inevitably affect companies' profits. In fact, there has been a rising interest among institutional investors concerning the impacts of water on companies' financial performance.

Before the launch of CDP's Water Security Program, the means for investors and other company stakeholders to understand individual companies' water risks were very limited. CDP's Water Security Program has now become a valuable source of information for institutional investors to obtain an understanding of companies' water-related risks and opportunities. CDP's Water Security Program is in its ninth year of operation, and has been requesting disclosure from Japanese companies for the past 5 years. We at KPMG Japan are honored to be able to contribute to CDP Water Security Program with a focus on Japanese companies for the fifth consecutive year.

This year, responses were obtained from 186 companies (60%) out of the 309 companies invited to respond to the water questionnaire. The response rate increased by 9 points from 51% in 2017. On the other hand, voluntary responses were obtained from 13 companies, the same as the previous year. This indicates that increasingly, more companies are willing to respond to investors' growing interest in corporate risks and opportunities related to water.

There has been a significant update to the structure of the CDP's 2018 water questionnaire in alignment with the final recommendations of the Task Force on Climate-related Financial Disclosures (TCFD). Changes have also been made to the indicators in order to accommodate discussions during the revision process of the GRI 303: Water and Effluents. As a result, the questionnaire now asks for additional information and data to reflect the most advanced corporate water management practices.

There is still more to be discussed about how companies should assess risks, what actions (including target setting and internal pricing on water) should be taken, and what information should be disclosed. We expect, as such discussions progress, some consensus on the approach to water risk assessment, actions, and disclosure will be formed in due course. The process of responding to CDP's Water Security questionnaire will not only help to provide more useful information to investors but will also be instrumental in providing a framework for companies to transition to global best practice water management in pursuit of a water secure world.

KPMG leverages its professionals' expertise and experience to assist companies in responding to sustainability challenges such as water and climate change, through its Sustainability Services network. We, as the Sustainability Services practice in Japan, will provide Japanese companies with assistance in identifying and evaluating water risks, establishing and implementing water policy and strategy, and reporting on performance, while providing continued support to CDP's Water Security Program.

Kazuhiro Saito
Managing Partner
KPMG AZSA Sustainability Co., Ltd

Scoring: a measure of a company's environmental performance

Scoring at CDP is mission-driven, focusing on CDP's principles and values for a sustainable economy and as such scores are a tool to communicate the progress companies have made in addressing environmental issues, and highlighting where risks may be unmanaged. CDP has developed an intuitive approach to presenting scores that highlight a company's progress towards leadership using a 4 step approach: **Disclosure** which measures the completeness of the company's response; **Awareness** which intends to measure the extent to which the company has assessed environmental issues, risks and impacts in relation to its business; **Management** which is a measure of the extent to which the company has implemented actions, policies and strategies to address environmental issues; and **Leadership** which looks for particular steps a company has taken which represent best practice in the field of environmental management.

CDP's 2018 questionnaires take a sector focused approach, under this new approach, each of CDP's questionnaires has general questions alongside sector-specific question aimed at high impact sectors.

The scoring methodology clearly outlines how many points are allocated for each question and at the end of scoring, the number of points a company has been awarded per level is divided by the maximum number that could have been awarded. The fraction is then converted to a percentage by multiplying by 100.

In order to better focus on key data points and provide a more detailed breakdown of a company's score, each question falls into a scoring category. Different weightings will be applied amongst sector scoring categories, and the number of points achieved per scoring category are used to calculate the final score for Management and Leadership levels, according to the scoring category weighting.

A minimum score and/or the presence of a minimum number of indicators on one level will be required in order to be assessed on the next level. If the minimum score threshold is not achieved, the company will not be scored on the next level. The final letter grade is awarded based on the score obtained in the highest achieved level. For example, Company X achieved 88% in Disclosure level, 82% in Awareness and 65% in Management will receive a B. If a company obtains less than 44% in its highest achieved level (with the exception of Leadership), its letter score will have a minus. For example, Company Y achieved 81% in Disclosure level and 42% in Awareness level resulting in a C-.

Public scores are available in CDP reports, through Bloomberg terminals, QUICK terminals, Google Finance and Deutsche Boerse's website. CDP operates a strict conflict of interest policy with regards to scoring and this can be viewed at <https://www.cdp.net/scoring-conflict-of-interest>.

		Threshold
A		55-100%
Leadership	A-	0-54%
B		45-69%
Management	B-	0-44%
C		45-79%
Awareness	C-	0-44%
D		45-79%
Disclosure	D-	0-44%

F = Failure to provide sufficient information to CDP to be evaluated for this purpose⁷

⁷ Not all companies requested to respond to CDP do so. Companies who are requested to disclose their data and fail to do so, or fail to provide sufficient information to CDP to be evaluated will receive an F. An F does not indicate a failure in environmental stewardship.

Water Security A List 2018

Company	Country
Biotech, Health Care & Pharma	
AstraZeneca	UK
Bayer AG	Germany
Food, Beverage & Agriculture	
Asahi Group Holdings, Ltd.	Japan
Kirin Holdings Co Ltd	Japan
Suntory Beverage & Food	Japan
Altria Group, Inc.	USA
Coca-Cola European Partners	UK
Diageo Plc	UK
General Mills Inc.	USA
Oil & Gas Processing	
Galp Energia SA	Portugal
Infrastructure	
ACCIONA S.A.	Spain
Hospitality	
Las Vegas Sands Corporation	USA
Manufacturing	
KAO Corporation	Japan
Mitsubishi Electric Corporation	Japan
Nabtesco Corporation	Japan
Toyota Industries Corporation	Japan
Braskem S/A	Brazil
Brembo SpA	Italy
CNH Industrial NV	UK
FIRMENICH SA	Switzerland
Ford Motor Company	USA
International Flavors & Fragrances Inc.	USA
LG Display	Republic of Korea
LG Innotek	Republic of Korea
L'Oréal	France
Metsä Board	Finland
Stanley Black & Decker, Inc.	USA
Materials	
LIXIL Group Corporation	Japan
Klabin S/A	Brazil
Retail	
Gap Inc.	USA
Services	
Microsoft Corporation	USA



We've seen that recently its not only international investors engaging in ESG issues, the number of Japanese investors integrating these issues into investment activities is on the rise. Take Sumitomo Mitsui Trust Asset Management Co., Ltd. for example, who have established the following four areas as major themes of their engagement activities for the year ahead.⁸

1. Issues related to climate change
2. Issues related to water resource and marine pollution
3. Support for strong corporate governance on environmental issues
4. Encouragement of ESG information disclosure

Interviewing Mr. Seiji Kawazoe and Mr. Takeshi Wada, who are the Chief Officers of Stewardship Development Dept., we asked why they chose 'issues related to water resource and marine pollution' as their major engagement theme and how they plan to conduct their engagement activities.

Sumitomo Mitsui Trust Asset Management Co., Ltd. manages investment assets totaling JPY62.8 trillion (US\$571 billion), engaging with 500 global companies annually⁹ and acts as a lead organization in PRI Water's working group.

Q1: What are your reasons for choosing "water issues" as a major engagement theme?

A1: *Water is a valuable global resource. Corporate activities that depend heavily on water could be at risk from worsening water security. We therefore believe that active management is required.*

As water issues are influenced by worsening climate change, we need to deal with the theme as a holistic viewpoint, including the supply chain. It is therefore an important issue for long-term investors to review the water usage and management practices of companies.

Q2: What is your policy for engagement activities on water issues?

A2: *We request companies to ensure the management of water related issues throughout the supply chain. Water is also an important social issue which requires the consideration of stakeholder interests such as relevant local communities.*

We think this is also an important topic for investor-company engagement. Thus, we place significance value in engaging with companies on these issues.

Q3: How do you use CDP data?

A3: *We use CDP Water data as a reference when engaging with companies. Investor research reports authored by CDP cover a broad area of climate change and water issues and are useful for us to recognize and compare companies across sectors with a holistic viewpoint.*

We particularly pay attention to responses by companies on their management's involvement in water issues.

Q4: What are the effects of your engagement?

A4: *In order to assess the effectiveness of our engagement activities more accurately, we collaborate with overseas investors who share common awareness of these issues. In addition, we work with various stakeholders, including NGOs to accumulate knowledge and assess the success of engagement activities.*

One of the criteria for assessing this is the extent of information disclosure. In particular, the disclosure of the management's involvement in managing environmental risk is key as it can lead to a reduction in risk for investors.

We use CDP scores, PRI's assessment, and ratings by external ESG research companies based on disclosed information as references when assessing companies.

Q5: What are your expectations of Japanese companies?

A5: *We expect them to consider environmental issues holistically, including water and climate change. In particular, we require Japanese companies to manage water risk in their supply chains. When companies expand production and consumer markets overseas, they are required to understand ESG issues in these geographies and respond to their direct and indirect impacts on economic activities.*

Japanese companies need to be aware of global ESG issues. We intend to play a role to improve the awareness of global environmental issues among Japanese companies and consider solutions together with them.

^{8, 9} http://www.smtam.jp/shared/images/company/policy/stewardship/activity_status/images/stewardship_report2018_2019_2.pdf

Executive Summary

60%

Response rate of Japanese Companies (186/309)



Companies should make further efforts in the assessment of risks and opportunities, target setting, responses to risks and opportunities, and disclosure of information in proportion to their level of water-related risks and opportunities.



This year marks the fifth year of CDP's water program for Japanese companies. In 2018, CDP's water information request was sent to 309 Japanese companies, selected based on market capitalization and environmental impact, 186 (60%) of which responded.¹⁰ An additional 13 companies voluntarily provided responses to CDP's Water Security questionnaire. (The response rate for all the 328 Japanese companies who received the questionnaire including self-selected companies is 61%.) This report outlines the results of the analysis of information provided by these 191 companies, including voluntary responses.

Key Findings

Response rate of Japanese companies

Of the 309 companies invited to respond, 186 (60%) did so. The response rate increased by 9 points from 51% year-on-year despite the anticipated negative effects due to a major update to the questionnaire and an introduction of an annual administrative fee. On the other hand, voluntary responses were received from 13 companies, which remained the same as the previous year. This indicates that increasingly more companies are willing to respond to investors' growing interest in corporate risks and opportunities related to water.

When broken down by the primary industrial sector, 74% responded in the Materials sector and 69% responded in the Manufacturing sector whereas 20% did so in the Power generation sector and 16% in the Retail sector. The response rates in the Food, beverage and agriculture, Fossil fuels and Infrastructure sectors were also below the overall response rate. Given the information needs of investors, it is hoped that response rates will improve in the sectors such as Food, beverage and agriculture, Fossil fuels and Power generation.

Engagement with value-chain partners

Of those Japanese companies that recognize the importance of water availability for indirect use, 71% engage with their value-chain partners, such as suppliers, on water-related issues. Among all sectors, as many as 79% of the companies in the Food, beverage and agriculture sector are engaging with value-chain partners. Their engagement may be prompted mostly by a desire to ensure stable sourcing of agricultural raw materials.

Awareness of water risks and opportunities

Based on results of water risk assessments, 66% of respondents identify "water-related risks with the potential to have a substantive impact on business" either in direct operations or value chains, or in both. This is a 9-point increase from the previous year. The companies that are aware of water-related opportunities also increased 6 points to 73%.

In response to water risks identified in direct operations, many companies have adopted water efficiency, reuse, recycling, and conservation practices, or have developed flood emergency plans. On the other hand, supplier diversification and the amending of business continuity plans are commonly reported as primary responses to risks in value chains.

Governance and strategies

73% of respondents have a documented water policy that is publicly available and 81% report that there is board-level oversight of water-related issues within the company. CDP's 2018 water questionnaire introduced new questions regarding the use of scenario analysis and internal pricing on water, which has revealed that only a fraction of companies fully use such measures.

Quantitative targets and qualitative goals

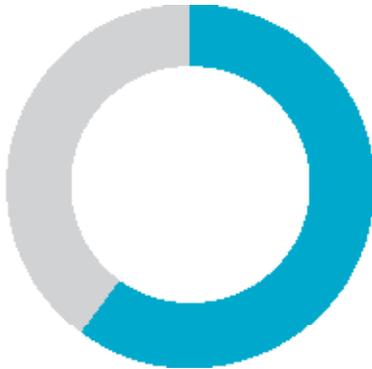
129 companies (68%) set both quantitative targets and qualitative goals, while only 26 companies (14%) have neither. Most companies have quantitative targets concerning water use.

Conclusion

With an increase in water-related extreme events such as droughts and floods in recent years, the total annual cost of damages worldwide is projected to soar. In the future, there will be more cases where the business performance of a company is greatly affected by the manifestation of water risks. Against this backdrop, institutional investors' interest in the impact of water on a company's bottom line is rising.

Companies will be expected to redouble their efforts in tackling water issues in order to respond to ever more accelerated investment activities of investors in relation to water. Such efforts would include in-depth water risk assessments in proportion to the level of potential water risks, target setting considering properties of the watershed in which a company site is located, engagement with stakeholders and value-chain partners, the use of internal pricing on water, and contribution to solving water-related social challenges through products and services. In fact, quite a few Japanese companies are taking a forward-looking approach, as seen in the examples cited in this report. Using those examples as a reference, companies should make further efforts in the assessment of risks and opportunities, target setting, responses to risks and opportunities, and disclosure of information in proportion to their level of water-related risks and opportunities.

¹⁰ The number of responding companies includes companies whose responses were submitted by their parent company.



60%

Response rate of Japanese companies (186/309)



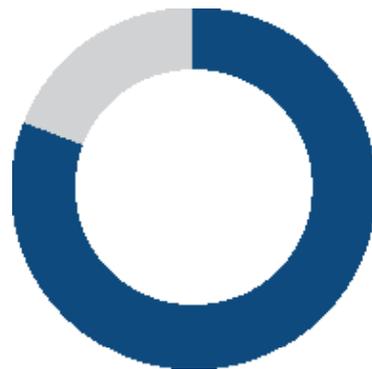
73%

Proportion of companies identifying water-related opportunities with the potential to have a substantive impact on business



71%

Proportion of companies engaging with value-chain



81%

Proportion of companies having board level oversight of water-related issues



66%

Proportion of companies identifying water risks with the potential to have a substantive impact on business



68%

Proportion of companies having both quantitative targets and qualitative goals

* Each figure is calculated based on the answered content among the companies subject to the relevant question.

Japanese company response to CDP Water Security 2018

Overview of responses

The response rate of Japanese companies was 60%

Of the 309 invited companies, 186 (60%) responded to the information request. The response rate increased by 9 points from 60% year-on-year, despite the anticipated negative effects due to a major update to the questionnaire and an introduction of an administrative fee. On the other hand, voluntary responses were received from 13 companies which remained the same as the previous year. This indicates that increasingly more companies are willing to respond to investors' growing interest in corporate risks and opportunities related to water.

Difference in attitudes toward water disclosure

When broken down by the primary industrial sector, 74% responded in the Materials industry and 69% responded in the Manufacturing industry whereas 20% did so in the Power generation industry and 16% in the Retail industry. The response rates in the Food, beverage and agriculture, Fossil fuels and Infrastructure industries were also below the overall response rate. (Table 1) Those industries such as Food, beverage and agriculture, Fossil fuels and Power generation are generally considered to be associated with greater risks or opportunities related to water and therefore investors' information needs are thought to be higher for them. It is hoped that more companies in these industries will disclose water-related information so that the information needs of investors will more fully be met.

The following sections outline the results of an analysis of information provided by 191 companies, including voluntary responses.

Importance of Water

Freshwater availability for direct/indirect use is important for many companies.

Japanese companies that report having sufficient amounts of high quality freshwater available for use is important ("Vital" or "Important") are 84% for direct use and 77% for indirect use. Freshwater availability for direct/indirect use is important for many companies.

Engagement with Value-chain partners

71% of respondents engage with their value-chain partners

Of those Japanese companies that recognize the importance of water availability for indirect use, 71% engage with their value-chain partners, such as suppliers, on water-related issues. Of those companies, 19% engage with suppliers and value-chain partners in other stages of the value chain, 40% only with suppliers, and 12% only with value-chain partners in other stages of the value chain.

Among all industries, as many as 79% of the companies in the Food, beverage & agriculture industry are engaging with value-chain partners. One of the possible reasons for this high percentage would be that, while it is crucial for the operations of companies in this industry to secure stable sourcing of agricultural raw materials, there is also an increased risk of crop yields being affected by droughts and floods with the acceleration of climate change.

Asahi Group Holdings, for example, evaluates suppliers based not only on their product quality, cost competitiveness, and supply capabilities but also on other factors such as their water conservation practices, before signing a contract, so that stable supply of raw materials can be secured.

Monitoring

Almost all companies monitor water withdrawals, but 12% do not specifically monitor withdrawals from water-stressed areas

Of those Japanese companies that to some extent recognize the importance of water availability for direct use, 59% regularly monitor water withdrawals at all their business sites, and almost all companies monitor water withdrawals (Figure 1). On the other hand, 12% of respondents have never specifically monitored "water withdrawals volumes from water stressed areas" on a regular basis. This suggests that quite a few companies have not yet identified water-stressed business sites or, if they have, do not conduct proper monitoring of water withdrawals from water-stressed areas.

As to the proportion of withdrawals sourced from water-stressed areas, the largest number of companies report "less than 10%," (73 companies, 42%) followed by "no business sites in water-stressed areas," (30 companies, 17%) and "10% or more but less than 20%" (17 companies, 10%) (Figure 2).

14% of respondents do not monitor the volume of total water use that is recycled or reused

14% of respondents do not monitor the volume of total water use that is recycled or reused. This may suggest that the definition of water recycling/reuse is not always clear to companies, or that keeping track of the total volume of water recycled/reused is challenging in practice. Similarly, 20% have never monitored the effluent temperature. This could be because not many facilities are legally required to monitor the temperature of effluent, or because it does not always make sense for companies that are not involved in operations producing thermal discharge, such as thermal power generation, to monitor the temperature of effluent.

Figure 1. Water aspects monitored (N=174)

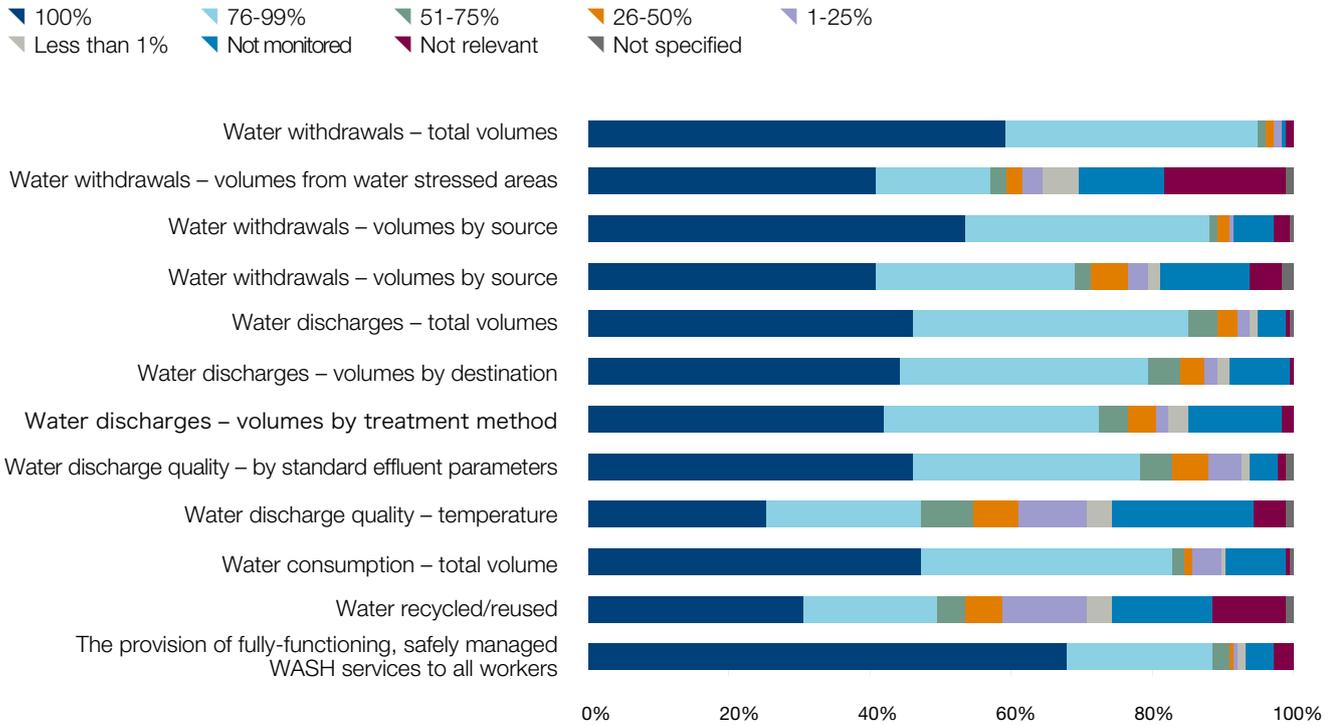


Table 1. Response to CDP's 2018 Water Security (by industry)

Industry	Response rate	Number of responding companies
Apparel	100%	3
Biotech, Health Care & Pharma	62%	18 (19)
Food, beverage & agriculture	58%	18
Fossil fuels	57%	4
Hospitality	17%	1
Infrastructure	45%	5 (7)
Manufacturing	69%	107 (111)
Materials	74%	14 (15)
Mineral extraction	100%	1
Power generation	20%	2
Retail	16%	4
Servies	90%	9 (13)
Transportation services	0%	0 (1)

Note: The figure between brackets indicates the number including the voluntary responding companies.

Figure 2. Proportion of total withdrawals sourced from water-stressed areas (N=117)

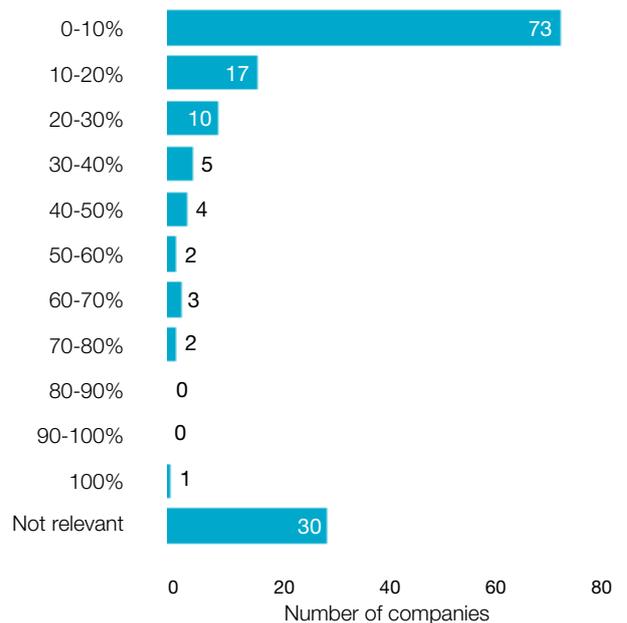
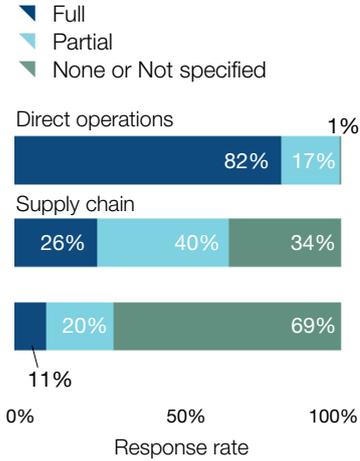


Figure 3. Water-related risk assessment coverage (N=161)



Water Risk Assessment

84% of respondents assess water risks.

84% of respondents assess water risks. Of those companies, almost all assess water risks in direct operations, whereas only 66% do so in their supply chains (Figure 3). Even fewer companies include value-chain partners other than suppliers in their water risk assessment. Regarding the frequency of the assessment, respondents most commonly assess water risks annually.

Over 90% of respondents report that they always consider water availability and water-related regulatory frameworks in assessing water risks (Figure 4). In contrast, fewer than 70% always take into account the status of ecosystems and habitats or stakeholder conflicts concerning water resources in their water risk assessment.

More than 80% of respondents report regulators, local communities, and employees as stakeholders that are always considered when assessing water risks (Figure 5). There are various possible approaches to reflecting local community views in the assessment of water risks.

Suntory Beverage & Food is one of the companies that effectively reflect local stakeholders' views in their water risk assessment. It has set up an Environmental Impact Assessment Committee at the Suntory Okudaisen Bunanomori Factory, where local government and academic experts get together annually to discuss how best to monitor the level of groundwater, and the outcome of discussion is taken into account in assessing water risks. As a result of these efforts, the factory achieved Alliance for Water Stewardship Certification in December 2018.

Risks and Opportunities

66% and 73% of respondents identify water risks and opportunities, respectively

As a result of water risk assessments, 66% of respondents identify "water-related risks with the potential to have a substantive impact on business" either in direct operations or value chains, or in both. This is a 9-point increase from the previous year. The companies that identify water-related opportunities also increased 6 points to 73%.

In recent years, it has increasingly become a common practice among Japanese companies to undertake water risk assessments. However, the maturity of assessment of water risks in direct operations and supply chains differs significantly among companies. The increase in the number of Japanese companies identifying water-related risks and opportunities may indicate that they have increasingly sophisticated assessments of water risks and opportunities.

Awareness of risks and opportunities vary greatly among sectors

Awareness of risks and opportunities varies greatly among sectors, reflective of each sector's water risk profiles. In the Food, beverage & agriculture industry, 81% of respondents are aware of water risks while 69% recognize opportunities related to water. It could be that many companies in this sector envisage few opportunities for providing solutions for water-related issues, while they directly use a relatively large amount of water in their operations and indirectly require an even larger amount of water in the production of agricultural raw materials they purchase, which make them susceptible to droughts and floods.

On the other hand, 71% in the Biotech, Health Care & Pharma industry, 69% in the Manufacturing industry and 67% in the Materials industry recognize water risks whereas 82%, 76% and 73% for each sector see opportunities related to water. As such, many companies in those sector perceive greater positive impacts on their business from opportunities for providing solutions for water-related issues than they see negative impacts from water risks in their direct operations.

Figure 4. Contextual issues always considered in water-related risk assessments (N=159)

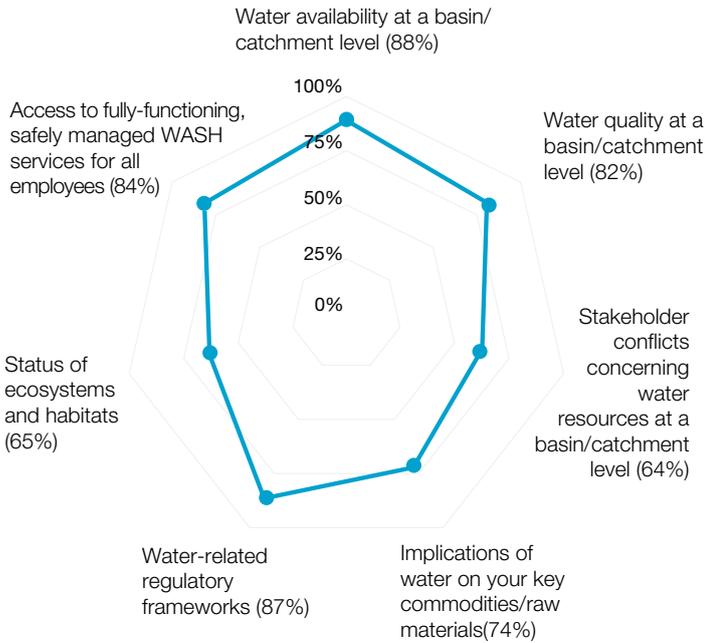


Figure 5. Stakeholders always considered in water-related risk assessments (N=159)

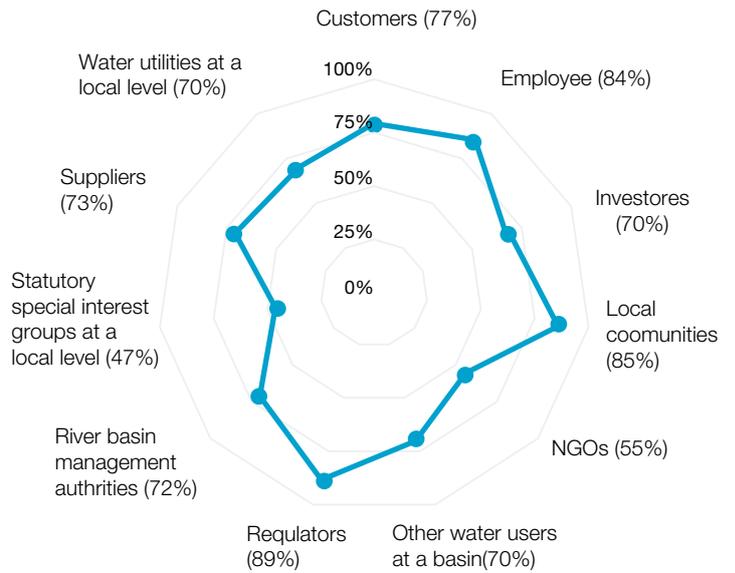


Figure 6. Countries with exposure to substantive water risks in direct operations (top 6) (N=127, multiple answers allowed)



Water risks in direct operations

Countries where exposure to substantive water risks are frequently reported for direct operations include Japan, China, Thailand, India, and Indonesia (Figure 6).

Quite a few companies cite 'Flooding,' 'Increased water scarcity,' 'Increased water stress,' and 'Declining water quality' as major water risk drivers in direct operations, and most commonly reported potential impacts on direct operations include 'Reduction or disruption in production capacity,' 'Closure of operations,' and 'Increased operating costs' (Figure 7).

In order to respond to water risks, many companies 'adopt water efficiency, water reuse, recycling, and conservation practice' or 'develop flood emergency plans.' **Mitsubishi Chemical Holdings**, for example, ensures access to multiple water sources as backup water supplies and uses groundwater if needed as measures to minimize the potential impacts of drought. It also has manuals in place at all plants with higher drought risk, outlining the measures to be taken in case of drought such as rules for cooperating with local governments and prioritization of water use.

Water risks in value chains

Many respondents similarly cite 'Flooding,' 'Increased water scarcity,' and 'Increased water stress' as major water risk drivers in value chains. 'Reduction or disruption in production capacity,' 'Supply chain disruption,' and 'Disruption to sales due to value chain disruption' are commonly viewed as potential impacts (Figure 8).

'Supplier diversification' and the 'amending of business continuity plans' are cited by many companies as primary responses to water risks in value chains. Some companies engage with suppliers to address their water-related risks. **Kirin Holdings**, for example, helped its supplier tea plantations in Sri Lanka obtain the Rainforest Alliance (RA) certificate through providing technical and financial assistance in properly treating water discharges from factories and residences within the tea plantations and in preserving water sources located in the tea estates.

Water-related opportunities

Regarding water-related opportunities, many respondents perceive 'Increased sales of existing products/services,' 'Cost savings,' 'Improving water efficiency in operations,' and 'Increased brand value' as primary opportunities (Figure 9).

When it comes to opportunities related to products or services, while many report the development of new products for water treatment or products that require less water when they are used, some companies are trying to develop products that use less water during production. For example, Uniqlo operator **Fast Retailing** has already developed a technology that cuts water use significantly during the finishing process of its jeans. Using this technology, it has successfully reduced water consumption by a maximum of 99%, with an average of 90%, in the production process of some products. The company is now planning to expand production of products that employ this new technology.

Figure 7. Potential impact on direct operations (N=124, multiple answers allowed)

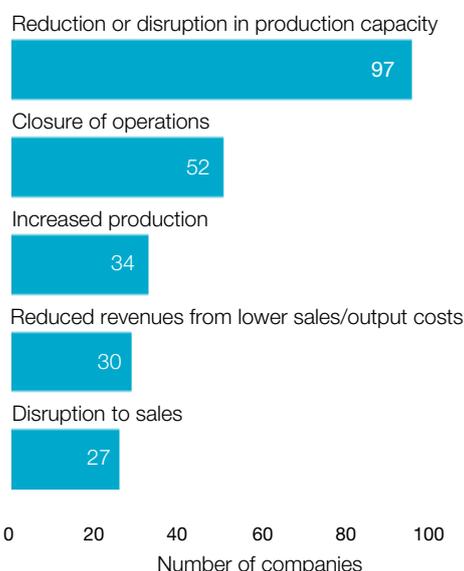


Figure 8. Potential impact on value chains (N=56, multiple answers allowed)

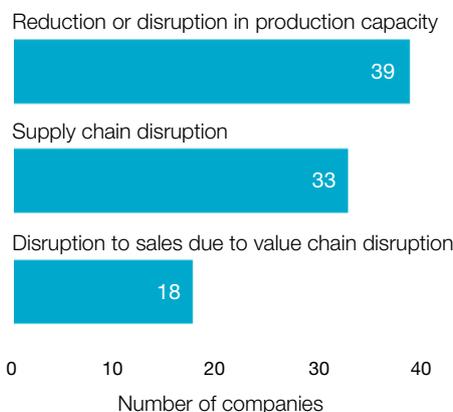
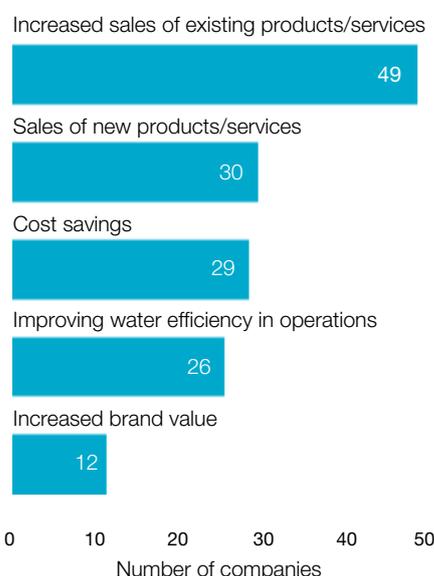


Figure 9. Water-related opportunities (N=139, multiple answers allowed)



Governance and Strategies

81% of respondents report that there is board-level oversight of water-related issues.

Of the companies that responded to the questionnaire, 73% have a documented water policy that is publicly available and 81% report that there is board-level oversight of water-related issues within the company. The positions of individuals on the board that are typically reported to have responsibility for water-related issues include 'Director on board' (53 companies), 'President' (35 companies), and 'Chief Executive Officer (CEO)' (29 companies).

53% of respondents integrate water-related issues into their 'Long-term business objectives,' 52% into 'Strategy for achieving long-term objectives,' and 41% into 'Financial planning.'

Only a fraction of companies report that they use internal pricing on water.

There is only a fraction of companies that use internal pricing on water in order to quantify, in monetary terms, the 'true' value of water, which is not fully reflected in market prices, and incorporate it in their decision making.

NGK Insulators estimates both present and future water risks using shadow water prices for its sites of particular concern for high water stress. Shadow water prices are estimated prices of water per cubic meter which express, in monetary terms, the 'true' value of water resources that is not reflected in water tariffs. Shadow water prices tend to be high for densely populated areas and areas where water resources are scarce.

Target setting

68% of respondents set both quantitative targets and qualitative goals.

129 companies (68%) set both quantitative targets and qualitative goals while only 26 companies (14%) have neither.

Many companies set targets related to water use as their quantitative targets.

Many companies set quantitative targets related to water use, such as 'Reduction in water withdrawals' (59 companies), 'Reduction in water consumption,' (40 companies) and 'Improvement in water use efficiency' (21 companies), but 22 companies cited targets related to reduction of pollution load from waste water. Other companies set targets toward helping solve social challenges related to water by providing their own products.

For example, **Toray Industries** describes two quantitative targets toward FY 2030 (compared with FY 2013) in the 'Toray Group Sustainability Vision' established in July 2018: one is a target related to operations aiming 'to reduce water usage in production activities by 30% per unit of sales across the entire Toray Group' while the other is a product-related target 'to triple the total annual volume of water treated using Toray's water treatment membranes.'

Figure 10. Position of the individual on the board with responsibility for water-related issues

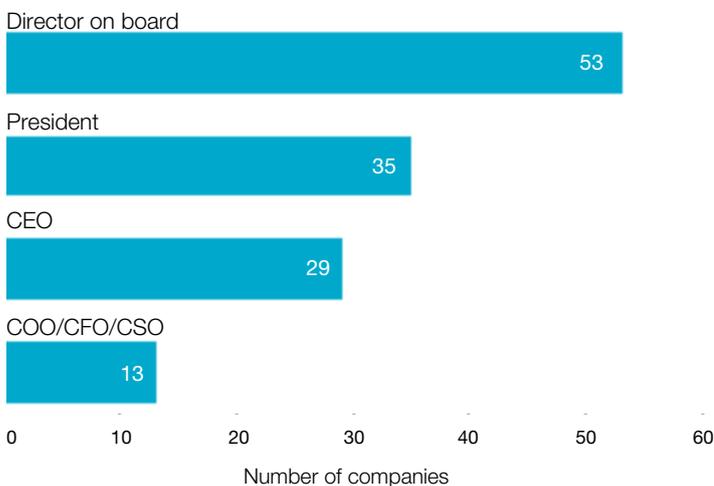
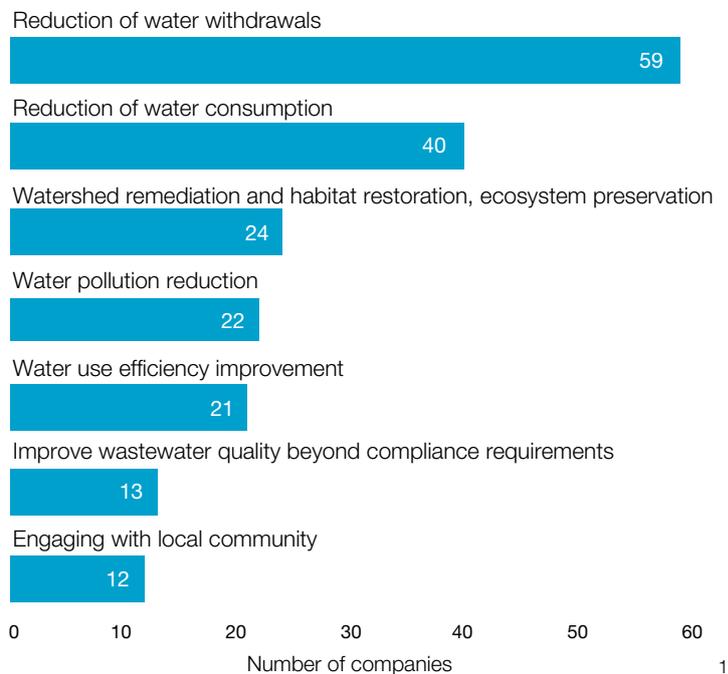


Figure 11. Most common targets and goals



Challenges in setting targets and goals

More companies are setting quantitative targets for water, but most are doing so without considering any context of the river basins where they operate. As water is a local resource and the impact of water usage largely depends on various conditions of the river basin, it is likely that Context-Based Water Targets (CBWTs), reflecting water scarcity in the river basin where facilities are located, will be necessary.

Many companies set qualitative goals concerning ecosystem and habitat restoration

Most commonly reported qualitative goals include 'Watershed remediation and habitat restoration, ecosystem preservation' (24 companies), 'Improve wastewater quality beyond compliance requirements' (13 companies), and 'Community engagement' (12 companies).

Scoring

In CDP's water program, companies are assessed based on their responses to CDP's water information request across four levels: 'Leadership', 'Management', 'Awareness,' and 'Disclosure.' If the minimum score threshold for one level is not achieved, the company will not be scored on the next level, and a letter grade is awarded based on the score obtained in the highest achieved level. In addition, from this year, weightings that vary for each sector are applied to the scoring categories in the 'Leadership' and 'Management' levels.

In CDP's 2018 Water Security questionnaire, 182 Japanese companies were assessed for scoring, and of those, 8 were included in CDP's Water Security A List. The number of A List companies has decreased from 12 to 8 this year, and the overall results are lower than the previous questionnaire, with the majority of the companies receiving a 'C' status. This may be largely attributable to the major update to the questionnaire and subsequent changes to the scoring criteria.

Conclusion

In recent years, water-related extreme events such as droughts and floods are on the rise, and for floods alone, the total annual cost of damages world-wide is projected to soar from US\$6 billion in 2005 to US\$25 billion by 2050.¹¹ In the future, there will be more cases where the business performance of a company is greatly affected by the manifestation of water risks. Against this backdrop, institutional investors' interest in the impact of water on a company's bottom line is rising, as is clearly demonstrated by a marked increase in the number of signatory institutional investors to CDP's water program, from 530 in 2013 to 655 in 2018.

In order for companies' water-related risks to be integrated into investors' actual investment decision making, they must be able to determine how those risks might crystallise. Investor Water Toolkit¹² released by Ceres in 2017 is precisely the guide to help investors understand the issue.

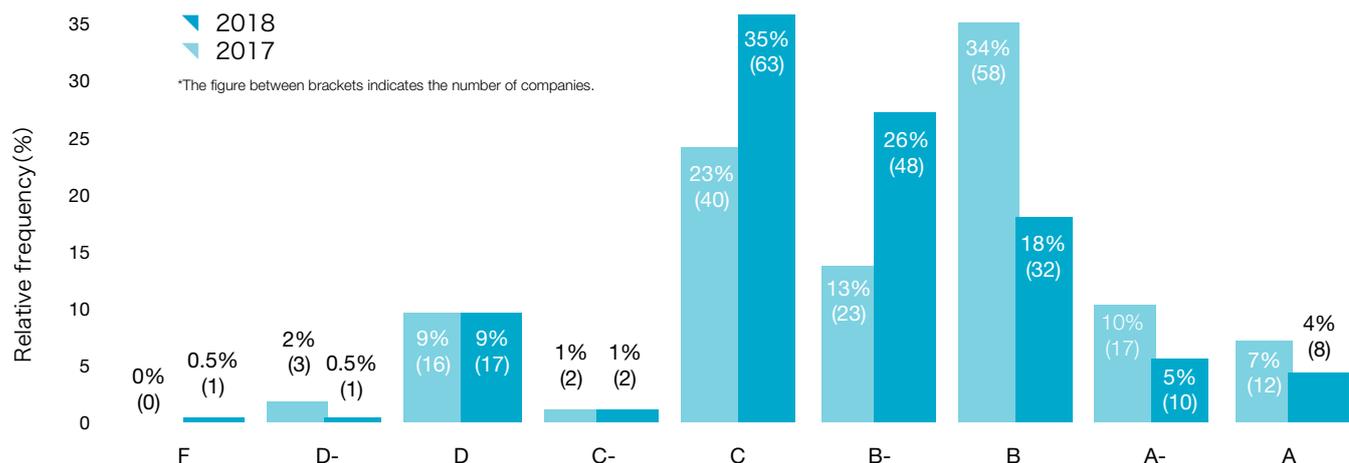
Companies will be expected to redouble their efforts in tackling water issues in order to respond to ever more accelerated investment activities of investors in relation to water. Such efforts would include in-depth water risk assessment in proportion to the level of potential water risks, target setting considering properties of the watershed in which a company site is located, engagement with stakeholders and value-chain partners, the use of internal pricing on water, and contribution to solving water-related social challenges through products and services.

In fact, quite a few Japanese companies are taking a forward-looking approach, as seen in the examples cited in this report. Using those examples as a reference, companies should make further efforts in the assessment of risks and opportunities, target setting, responses to risks and opportunities, and disclosure of information in proportion to their level of water-related risks and opportunities.

11 <https://www.nature.com/nclimate/journal/v3/n9/abs/nclimate1979.html>

12 <https://www.ceres.org/resources/toolkits/investor-water-toolkit?toolkit=view>

Figure 12. Distribution of Japanese companies' final score



Multifaceted nature of water issues and investor actions

Water issues are highly diverse and as a result the way in which companies approach these issues needs to be multifaceted.

Firstly, let's take a look at the characteristics of water issues. When it comes to water issues, we often imagine a shortage of water or water scarcity, which is, needless to say, a serious problem. However, it's misleading to think "that it's only overseas, developing countries that suffer from water scarcity." or "We don't need to care for the problem because we have enough rainfall in Japan." Even companies that only have domestic operations in Japan are not free from water issues.

For instance, water issues are driven by both supply and demand. On the supply side, this can be further broken down to issues relating to the quantity and the quality of water.

The problem of quantity is related to the water cycle of the earth which is being influenced by a changing climate. Due to climate change, precipitation patterns has changed greatly, in some areas this is driving drought conditions, whereas in others, unusually heavy rains are causing serious flooding. In 2018 we were plagued by frequent disasters caused by heavy rains and floods around the world, including in Japan. We should regard heavy rains and floods as a part of the issue when it comes to water, which is the other side of the coin to drought and water shortages.

On the other hand, issues regarding water quality are being driven by pollution problems, with industry playing a key role. Unless appropriate wastewater treatment is implemented, water that can originally be recycled cannot be used anymore. Not only manufacturing, but also production activities within the agricultural and mining industries are driving water pollution.

From the demand side, this is related to water usage. Increasing amount of unsustainable water withdrawals can also cause water shortages, especially in water stress areas. It is said nearly 70% of global water withdrawals are used by agriculture. An ever increasing population and resulting demand for food is putting increasing pressure on this precious resource.

Furthermore, water issues are not only an environmental problem but also one of a human rights issue. Without adequate access to a reliable source of clean water and sanitation services, this can result in public health problems. Without these basic needs, the lives of millions of are at risk and economic development is hampered In many developing countries.

For institutional investors who aim to capitalize on a vibrant economy, such issues which may hinder economic development is a risk that cannot be overlooked. At present, many countries suffer from a shortage of finance to achieve their national goals on water and sanitation. The financial sector needs to play a big role in addressing water security.

As shown above, water issues are diverse, and as a result the way in which companies approach these issues needs to be multifaceted.

Companies can have a significant impact on water issues, and conversely, water issues if not properly managed can negatively affect the business activities of companies. Companies also need to manage water risk in the supply chain, taking the globalization of business activities into consideration.

Companies' account for and wield a significant influence over freshwater resources. Their influence on water issues can be divided into two categories. They can either exacerbate water issues in water stressed regions by causing an increase in competition for water and degrading the water that's left, through activities associated with pollution. Or they can realize the opportunities associated with better water management and the sales of products and services that have a positive impact. Companies that continue to mismanage water resources, could face significant business risks that have an impact on the bottom line, in the form of regulatory, reputational or operational risk.

In the following section, the multifaceted aspects of water issues are outlined.

Multifaceted nature of water issues

United Nations Water (UN Water) is an UN entity which deals with water-related issues, established in 2003. The existence of the organization reflects the fact that water issues are associated with all important areas covered by the United Nations. It acts as a liaison with more than 30 organizations within UN for implementing various water and sanitation-related programs.

UN Water presents 'Water Facts' covering 12 different themes such as "Water and Climate Change", "Water and Disasters", "Human Rights and Water", and "Financing Water and Sanitation". Here, we examine these 'facts' and the multiple dimensions of water and sanitation. Please refer to the original contents on the UN Water website¹³. UN Water shows that water issues are urgent, diverse and interrelated challenges.

13 <http://www.unwater.org/water-facts/>

Table 2. UN Water - Water Facts

Water and Climate Change	<ul style="list-style-type: none"> ● More floods and severe droughts are predicted. Changes in water availability will also impact health and food security and have already proven to trigger refugee dynamics and political instability. ● More than 2 billion people live in countries experiencing high water stress. The situation will likely worsen as populations and the demand for water grow, and as the effects of climate change intensify. (United Nations, 2018) ● With the existing climate change scenario, by 2030, water scarcity in some arid and semi-arid places will displace between 24 million and 700 million people. (UNCCD)
Water and Disasters	<ul style="list-style-type: none"> ● 90% of all natural disasters are water-related. (UNISDR) ● Asia is the region most vulnerable to water-related disasters, accounting for more than 45% of fatalities and more than 90% of the people affected by disasters between 1980 and 2006. (UNESCO, 2009)
Water and Ecosystems	<ul style="list-style-type: none"> ● It is estimated that fewer than 20% of the world's drainage basins exhibit nearly pristine water quality. (UNESCO, 2009) ● Naturally occurring arsenic pollution in groundwater now affects nearly 140 million people in 70 countries on all continents. (WHO, 2018) ● The world has lost 70 per cent of its natural wetland extent, including a significant loss of freshwater species, over the last 100 years. (United Nations, 2018)
Financing Water and Sanitation	<ul style="list-style-type: none"> ● The current level of WASH (water, sanitation and hygiene) financing is not sufficient to meet SDG targets to achieve universal access to safe and affordable drinking-water, adequate sanitation and hygiene. ● 80% of countries report insufficient financing to meet national WASH targets. (GLAAS 2017) ● While international aid spending on WASH increased from US\$6.3 billion to US\$7.4 billion between 2012 and 2015, future commitments declined from US\$10.4 billion to US\$8.2 billion in the same period. (GLAAS 2017)
Water and Gender	<ul style="list-style-type: none"> ● Across low-income countries, women and girls have primary responsibility for management of household water supply, sanitation and health. Often, fulfilling these roles precludes any other occupation or participation in education, and their marginalization is compounded by the indignity and insecurity of having nowhere private to go to the toilet. Addressing the needs of females in relation to water, sanitation and hygiene is a key driver in achieving gender equity and unlocking the potential of half of global society. ● Women and girls are responsible for water collection in 8 out of 10 households with water off premises, so reducing the population with limited drinking water services will have a strong gender impact. (WHO and UNICEF, 2017) ● Reducing the time it takes to fetch water from 30 to 15 minutes increased girls' school attendance by 12% according to a study in Tanzania. (UNICEF)
Human Rights to Water and Sanitation	<ul style="list-style-type: none"> ● Access to water and sanitation are recognized by the United Nations as human rights, reflecting the fundamental nature of these basics in every person's life. ● The human right to safe drinking water was first recognized by the UN General Assembly and the Human Rights Council as part of binding international law in 2010. (UN, 2010) ● The human right to sanitation was explicitly recognized as a distinct right by the UN General Assembly in 2015. (UN, 2016)
Water Quality and Wastewater	<ul style="list-style-type: none"> ● Globally, it is likely that over 80% of wastewater is released to the environment without adequate treatment (UNESCO, 2017). ● The opportunities from exploiting wastewater as a resource are enormous. Safely managed wastewater is an affordable and sustainable source of water, energy, nutrients and other recoverable materials. (UNESCO, 2017). ● The costs of wastewater management are greatly outweighed by the benefits to human health, economic development and environmental sustainability – providing new business opportunities and creating more 'green' jobs. (UN-Water, 2011)
Water Scarcity	<ul style="list-style-type: none"> ● Around 1.2 billion people, or almost one-fifth of the world's population, live in areas of scarcity. Another 1.6 billion people, or almost one quarter of the world's population, face economic water shortage (where countries lack the necessary infrastructure to take water from rivers and aquifers). (FAO, 2007) ● 3.6 billion people worldwide (nearly half the global population) are already living in potential water-scarce areas at least one month per year and this could increase to 4.8–5.7 billion in 2050 (UNESCO, 2018) ● About 73% of the affected people live in Asia (69% by 2050) (Burek et al., 2016).
Transboundary Waters	<ul style="list-style-type: none"> ● There are 263 transboundary river basins and approximately 300 transboundary aquifers. (UNECE/UNESCO 2015) ● 145 states have territory within these basins, and 30 countries lie entirely within them. (UNECE/UNESCO 2015) ● Since 1948, history shows only 37 incidents of acute conflict over water, while during the same period, approximately 295 international water agreements were negotiated and signed. (UNECE/UNESCO 2015)
Water and Urbanization	<ul style="list-style-type: none"> ● Today, 55% of the world's population lives in urban areas, a proportion that is expected to increase to 68% by 2050, adding another 2.5 billion people to urban areas with close to 90% of the increase taking place in Asia and Africa (UN DESA, 2018). ● In sub-Saharan Africa, three out of five people with basic handwashing facilities live in urban areas. (WHO/UNICEF, 2017) ● 39% of the global population (2.9 billion people) use a safely managed sanitation service. Most of these people (3 out of 5) live in urban areas. (WHO/UNICEF, 2017)
Water, Sanitation and Hygiene	<ul style="list-style-type: none"> ● 50% of child malnutrition is associated with unsafe water, inadequate sanitation and poor hygiene. (WHO 2008) ● Hygiene promotion is the most cost effective health intervention. (World Bank 2016)
Waste, Food and energy	<ul style="list-style-type: none"> ● Agriculture accounts for 70% of global water withdrawal. (FAO) ● Global water demand (in terms of water withdrawals) is projected to increase by 55% by 2050, mainly because of growing demands from manufacturing (400% increase). More than 40% of the global population is projected to be living in areas of severe water stress by 2050. (OECD, 2012) ● While almost 800 million people are currently hungry, by 2050 global food production would need to increase by 50% to feed the more than 9 billion people projected who live on our planet (FAO/IFAD/UNICEF/WFP/WHO, 2017).

Economic damage caused by windstorm or flood in Japan in terms of payment amount of general insurance claims

Lastly, we examine the impact of the increasing number of storm and flood related disasters, including typhoons, using the amount paid through general insurance claims as a parameter. Storm and flood related disasters are an imminent and substantial physical risk for our country, Japan.

In 2018, Japan was hit by a series of devastating natural disasters, notably windstorms and floods. According to the Japan Meteorological Agency (JMA), as a result of a severe rainstorm in July of 2018, the maximum daily precipitation hit a new record high at 77 monitoring points throughout the country¹⁴. Furthermore, due to high wind and tidal waves caused by Typhoon Jebi, the tide level reached a record high in 6 monitoring points in the Osaka, Wakayama, Tokushima and Hyogo prefectures¹⁵. Consequently, the total amount of general insurance paid in 2018 totaled 1 trillion yen as stated below. Also, November 2018, insurance company Nikkei reported that it will raise the fire insurance premium in the fall of 2019¹⁶.

In order to assess the frequency of occurrence as well as the impact of these events, we have illustrated the total amount of general insurance claims paid in each fiscal year based on data from the 'General Insurance in Japan Fact Book 2018'¹⁷.

As you can see from the Table 3, the total amount paid exceeded 100 billion yen three times in five fiscal years until 2017. In fact, the total payment amount for three natural disasters including Typhoon 'Trami' (Typhoon No.24) reached a record high of 1,175.8 billion yen¹⁸.

In response to this the government has taken a number of actions. In December 2018, the Ministry of Land, Infrastructure, Transport and tourism (MLIT) released 'Changes to Fundamental Plan for National Resilience'. MLIT explained that one of the reasons for the revision to the plan was to apply lessons learned from a series of natural disasters since June 2018, and pointed out the necessity to assess their impact on business activities and to take actions accordingly.

A useful reference for assessing impact are the hazard maps published by local governments. These maps are publicly available on 'Hazard Map Portal Site'¹⁹ operated by MLIT. As of March 2017, 98% of local governments in Japan have published these hazard maps²⁰.

In March 2018, the Tokyo Metropolitan Government released a map of the likely flood zones resulting from high water tides, assuming a scenario that the largest-scale typhoon in Japan's history proceeds along a path which would cause the highest tidal waves. According to the map, 17 out of 23 districts (most of them in East Tokyo), the equivalent of 2.12 million square kilometers would be flooded. The metropolitan government assumes that some areas would remain flooded for more than a week in the case of the largest-scale levee breach or failure²¹. We recommend companies to assess, using the above assumption, the quantitative impact of high tide water on their businesses.

Conclusion

We have reviewed the multifaceted nature of water issues and the role of investors on the issue. We also established that water risks are both global and local in nature and Japan faces serious physical water risks that are exacerbated by climate change. It is required for companies to assess the impacts of water risks on their own business as well as their international supply chains, and demonstrate to their stakeholders such as investors and financial institutions how they are managing these risks.

It is essential that this information is disclosed through CDP's platform, which is used by 655 global institutional investors representing US\$87 Trillion in assets. The platform is designed to guide corporates through the challenges posed by worsening water security, while helping investors and companies with large supply chains better understand how their portfolio companies and suppliers are addressing their water impacts and associated risks and opportunities.

14 Japan Meteorological Agency
<https://www.data.jma.go.jp/obd/stats/data/bosai/report/2018/20180713/kyokutihyou20181023.pdf>, P4

15 Japan Meteorological Agency
https://www.data.jma.go.jp/obd/stats/data/bosai/report/2018/20180911/jyun_sokujij20180903-0905.pdf, P19

16 <https://www.nikkei.com/article/DGKKZO37703460T11C18A1MM8000/>

17, 18 FACT BOOK 2017-2018 GENERAL INSURANCE IN JAPAN, GIAJ
http://www.sonpo.or.jp/news/publish/sonpo/pdf/0003/fact2018_full.pdf

19 <https://disaportal.gsi.go.jp/>

20 http://www.mlit.go.jp/river/bousai/main/saigai/tisiki/syozaiti/pdf/shinsui-hm_h2803.pdf

21 Tokyo Metropolitan Government
<http://www.kouwan.metro.tokyo.jp/yakuwari/takashio/shinsuisoutei.html>

Figure 13. Total Claims Paid for Typhoons and Windstorms in Japan by fiscal year

▾ Total Claims Paid for Typhoons and Windstorms (Refer to GIAJ)
● Number of typhoons approaching Japan (Refer to Japan Meteorological Agency)

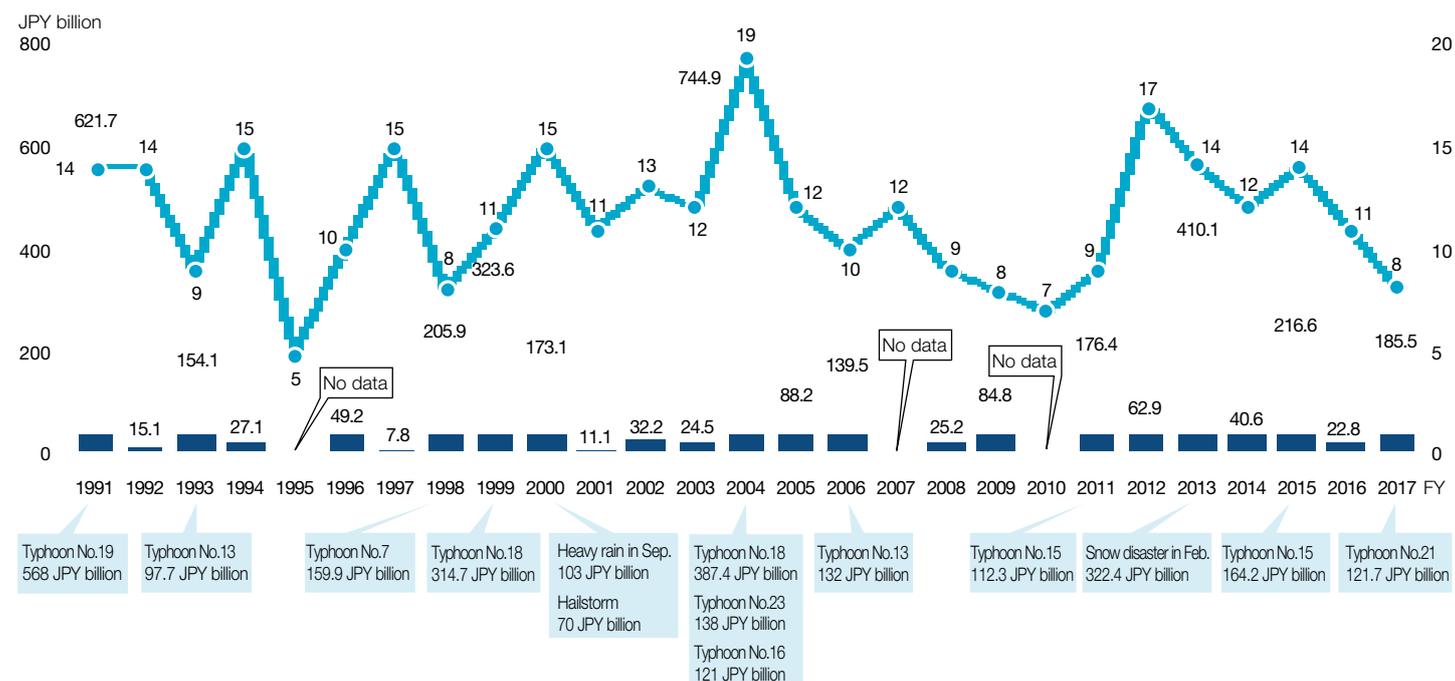


Table 3. 10 Largest Claims Paid for Typhoons and Windstorms in Japan

Rank	Name of Disaster	Place	Date	Claims Paid (in JPY billion)			
				Fire and Miscellaneous	Automobile	Marine	Total
1	Typhoon No. 19 (Typhoon Mireille)	Nationwide	Sep. 26-28, 1991	522.5	26.9	18.5	568.0
2	Typhoon No. 18 (Typhoon Songda)	Nationwide	Sep. 4-8, 2004	356.4	25.9	5.1	387.4
3	Snowfall, Feb. 2014	Kanto	Feb. 2014	298.4	24.1	-	322.4
4	Typhoon No. 18 (Typhoon Bart)	Kumamoto, Yamaguchi, Fukuoka, etc.	Sep. 21-25, 1999	284.7	21.2	8.8	314.7
5	Typhoon No. 15 (Typhoon Goni)	Nationwide	Aug.24-26, 2015	156.1	8.1	-	164.2
6	Typhoon No. 7 (Typhoon Vicki)	Kinki	Sep. 22, 1998	151.4	6.1	2.4	159.9
7	Typhoon No. 23 (Typhoon Tokage)	Western Part of the Nation	Oct. 20, 2004	111.2	17.9	8.9	138.0
8	Typhoon No. 13 (Typhoon Shanshan)	Fukuoka, Saga, Nagasaki, Miyazaki, etc.	Sep. 15-20, 2006	116.1	14.7	1.2	132.0
9	Typhoon No. 21 (Typhoon Lan)	Nationwide	Oct.21-23, 2017	114.6	7.1	-	121.7
10	Typhoon No. 16 (Typhoon Chaba)	Nationwide	Aug.30-31, 2004	103.8	13.8	3.5	121.0

Note: Figures are for GIAJ member direct insurers, and do not include foreign insurers or others.

Appendix 1: 2018 Global key trends

	Japan	USA	Canada	Brasil	UK	Germany	France	Turkey	South Africa	Australia
Total companies responding to investor request for water information	199	187	24	19	42	29	23	26	43	18
Total companies requested for water information by investors	328	332	55	27	68	40	38	62	60	48
Response rate	61%	56%	44%	70%	62%	73%	61%	42%	72%	38%
Respondents reporting that sufficient amounts of good quality freshwater available for use is 'vital' or 'important' for their direct operations	84%	85%	78%	89%	81%	73%	74%	88%	90%	89%
Respondents reporting that sufficient amounts of good quality freshwater available for use is 'vital' or 'important' for their indirect operations	77%	72%	52%	83%	62%	62%	65%	65%	86%	72%
Respondents reporting withdrawals from water-stressed areas	63%	55%	57%	67%	50%	62%	48%	77%	52%	61%
Respondents engaging their value chain on water-related issues	61%	71%	36%	60%	62%	72%	68%	69%	74%	47%
Respondents that have experienced detrimental water-related business impacts in the reporting year	17%	30%	26%	39%	31%	12%	35%	31%	69%	28%
Respondents that undertake a water-related risk assessment	84%	88%	91%	83%	88%	96%	91%	96%	98%	89%
Respondents exposed to substantive water risk both in direct operations and along the value chain	37%	32%	17%	61%	40%	19%	39%	46%	45%	11%
Respondents exposed to substantive water risk in direct operations only	28%	24%	39%	22%	21%	19%	22%	42%	45%	33%
Respondents exposed to substantive water risk in the value chain only	2%	3%	4%	6%	0%	8%	9%	0%	0%	6%
Respondents that identify and are realizing water-related opportunities	67%	73%	65%	78%	76%	65%	74%	92%	90%	39%
Respondents with a documented water policy that is publicly available	73%	68%	35%	50%	57%	58%	61%	77%	48%	50%
Respondents with board-level oversight of water issues	81%	80%	96%	78%	90%	96%	91%	96%	98%	94%
Respondents using climate-related scenario analysis to inform business strategy	40%	42%	45%	53%	44%	56%	59%	73%	26%	24%
Respondents identifying water-related outcomes from climate scenario analysis	29%	22%	23%	33%	31%	20%	41%	69%	26%	6%
Respondents using an internal price on water	10%	9%	23%	27%	3%	16%	14%	12%	10%	6%
Respondents with targets and goals that are monitored at the corporate level	43%	48%	35%	50%	52%	62%	57%	77%	43%	17%

Note:
This statistics for the number of responding companies and response rate includes those companies that respond by referencing a parent or holding company's response. However the remaining statistics presented do not include these responses.

The data in this table is based on binary data (e.g. Yes/No or other drop down menu selection) reported to CDP and does not incorporate any validation of the follow up information provided or reflect the scoring methodology. This is likely to lead to an over-reporting of data in this key trends table.

In order to compare the data among countries, it is not necessarily calculated based on the same methodology in the analysis for the main body of this report.

Appendix 2: CDP Water Security 2018 Japanese companies

Company	Questionnaire Sector ^a	2018 Score ^b	2017 Response status ^c	% withdrawn from stressed areas	Total number and % company-wide of facilities exposed to water risk		Identification of water-related opportunities ^d	Board level oversight of water-related issues	Engagement with value chain	Water-related outcomes from climate-related scenario analysis ^e	Water-related targets and/or goals
Apparel											
Asics Corporation	General	N/S	NR		No risks		Yes(r)				Business
Citizen Watch Co.,Ltd.	General	B-	AQ					Non public			
Toyobo Co., Ltd.	General	Private	NR					Non public			
Biotech, Health Care & Pharma											
Astellas Pharma Inc.	General	B-	AQ	0%	No risks		Yes(r)	Other	Supplier	Not water-related	Company-wide
Chugai Pharmaceutical Co., Ltd.	General	C	AQ					Non public			
Daiichi Sankyo Co., Ltd.	General	B-	AQ	1.9%	3	1-25%	Yes(r)	No	Supplier	In 2 years	Business, Company-wide, Country, Site/facility
Eisai Co., Ltd.	General	F	NR								
Hamamatsu Photonics K.K.	General	C	AQ	0%	10	100%	Yes(r)	Director on board	Supplier	In 2 years	Company-wide
Hisamitsu Pharmaceutical Co., Inc.	General	F	NR								
Hoya Corporation	General	F	AQ								
Kaken Pharmaceutical Co., Ltd.	General	F	NR								
Kissei Pharmaceutical Co., Ltd.	General	F	NR								
KYORIN Holdings, Inc.	General	F	NR								
Kyowa Hakko Kirin Co., Ltd.	General	SA	SA								
Mitsubishi Tanabe Pharma Corporation	General	SA	SA								
Mochida Pharmaceutical Co., Ltd.	General	F	NR								
Nihon Kohden Corporation	General	C	AQ	Not monitored	2	~1%	Yes(r)	CEO	Supplier	In 2 years	Activity, Business
Nippon Shinyaku Co., Ltd.	General	F	NR								
Nipro Corporation	General	F	NR								
Olympus Corporation	General	B-	AQ	0%	No risks		No	No	Supplier	No analysis	Company-wide, Site/facility
Ono Pharmaceutical Co., Ltd.	General	B	AQ	0%	8	1-25%	Yes(r)	CFO	Supplier	In 2 years	Business, Company-wide, Site/facility
Otsuka Holdings Co., Ltd.	General	C	NR	28%	6	1-25%	Yes(r)	No	Supplier	In 2 years	No target/goal
Rohto Pharmaceutical Co., Ltd.	General	F	NR								
Santen Pharmaceutical Co., Ltd.	General	C	AQ	Not relevant	No risks		Yes	President	Supplier	Not water-related	Activity, Company-wide, Site/facility
Sawai Pharmaceutical Co., Ltd.	General	C	AQ	Not relevant	No risks		No	Director on board	No engagement	No analysis	No target/goal
Shimadzu Corporation	General	C	AQ					Non public			
Shionogi & Co., Ltd.	General	N/S	NR	27%	5	51-75%	Yes(r)	No			Company-wide
Sumitomo Dainippon Pharma Co., Ltd.	General	C	AQ	45%	6	76-99%	Yes(r)	President	No engagement	In 2 years	Company-wide
Sysmex Corporation	General	C	AQ	Not monitored	14	1-25%	Yes(r)	Director on board	Supplier	In 2 years	Company-wide
Taisho Pharmaceutical Co., Ltd.	General	F	NR								
Takeda Pharmaceutical Company Limited	General	B	AQ	2%	4	1-25%	Yes(r)	C-Suite	Supplier	Water-related	Activity, Business, Company-wide, Site/facility
Terumo Corporation	General	C	AQ	3.1%	6	1-25%	Yes(r)	Director on board	Supplier	In 2 years	Business, Company-wide
Tsumura & Co.	General	C	AQ	Not relevant	3	26-50%	Yes(r)	Other	In 2 years	In 2 years	Other
Food, beverage & agriculture											

Company	Questionnaire Sector ^a	2018 Score ^b	2017 Response status ^c	% withdrawn from stressed areas	Total number and % company-wide of facilities exposed to water risk	Identification of water-related opportunities ^d	Board level oversight of water-related issues	Engagement with value chain	Water-related outcomes from climate-related scenario analysis ^e	Water-related targets and/or goals	
Ajinomoto Co.Inc.	FBT	A-	AQ	9%	9	1-25%	Yes(r)	Director on board	Supplier	Water-related	Basin, Company-wide, Site/facility
Ariake Japan	FBT	F	NR								
Asahi Group Holdings, Ltd.	FBT	A	AQ	0%	0	~1%	Yes(r)	Director on board	Supplier, Customer /Other	Water-related	Business, Company-wide, Site/facility
Calbee, Inc.	FBT	F	NR								
Coca-Cola Bottlers Japan Holdings Inc.	FBT	F	NR								
Coca-Cola East Japan Co., Ltd.	FBT	SA	SA								
Ezaki Glico Co., Ltd.	FBT	F	NR								
HOUSE FOODS GROUP INC.	FBT	F	NR								
Ito En, Ltd.	FBT	F	NR								
Itoham Yonekyu Holdings	FBT	F	NR								
Japan Tobacco Inc.	FBT	B	AQ	26%	No risks	No	Director on board	Supplier	Water-related	Business, Company-wide, Site/facility	
Kagome Co., Ltd.	FBT	B-	NR	3.4%	1	1-25%	Yes(r)	President, CSO, Director on board	Supplier	In 2 years	Activity, Company-wide, Site/facility
Kewpie Corporation	FBT	C	NR					Non public			
Kikkoman Corporation	FBT	A-	AQ	1.51%	3	1-25%	Yes(r)	CEO	Supplier, Customer /Other	Water-related	Business, Company-wide, Site/facility
Kirin Holdings Co Ltd	FBT	A	AQ	23%	2	1-25%	Yes(r)	CEO	Supplier, Customer /Other	Water-related	Business, Company-wide, Site/facility
Marubeni Corporation	FBT	B	AQ					Non public			
MEGMILK SNOW BRAND Co.,Ltd.	FBT	D	NR	Not monitored	No risks	No	No	No engagement	No analysis	No analysis	No target/goal
Meiji Holdings Co Ltd	FBT	D	NR	Not monitored	5	1-25%	Yes(r)	Other	Customer /Other	Water-related	Company-wide
Mitsubishi Corporation	General	D	AQ					Non public			
Mitsubishi Shokuhin Co., Ltd.	FBT	SA	SA								
NH Foods Ltd.	FBT	C	AQ					Non public			
Nichirei Corporation	FBT	B-	AQ	46.53%	7	1-25%	Yes(r)	Director on board	Supplier, Customer /Other	Water-related	Business, Site/facility
Nisshin Seifun Group Inc.	FBT	F	NR								
Nissin Foods Holdings Co., Ltd.	FBT	F	DP								
Sapporo Holdings Limited	FBT	Private	NR					Non public			
Sumitomo Forestry Co., Ltd.	P&F	C	AQ		0	~1%	No	CEO		In 2 years	Business, Company-wide
Suntory Beverage & Food	FBT	A	AQ	64%	1	1-25%	Yes(r)	Director on board	Supplier, Customer /Other	In 2 years	Activity, Company-wide, Country
Takara Holdings Inc.	FBT	F	NR								
Toyo Suisan Kaisha, Ltd.	FBT	F	NR								
Yakult Honsha Co Ltd.	FBT	F	NR								
Yamazaki Baking Co., Ltd.	FBT	F	NR								
Fossil fuels											
Cosmo Energy Holdings Co., Ltd.	O&G	C	AQ		No risks	No	Director on board			In 2 years	Site/facility

Company	Questionnaire Sector ^a	2018 Score ^b	2017 Response status ^c	% withdrawn from stressed areas	Total number and % company-wide of facilities exposed to water risk	Identification of water-related opportunities ^d	Board level oversight of water-related issues	Engagement with value chain	Water-related outcomes from climate-related scenario analysis ^e	Water-related targets and/or goals	
Idemitsu Kosan Co., Ltd.	O&G	Private	NR							Non public	
Inpex Corporation	O&G	F	NR								
Japan Petroleum Exploration Co., Ltd.	O&G	F	NR								
JXTG Holdings, Inc.	O&G	C-	AQ	0.6%	No risks	No	No	No engagement	In 2 years	No target/goal	
Showa Shell Sekiyu K. K.	O&G	C	AQ							Non public	
Tonen General Sekiyu K.K.	O&G	F	NR								
Hospitality											
McDonald's Holdings Company (Japan), Ltd.	General	SA	SA								
Oriental Land Co Ltd.	General	F	NR								
Resorttrust Inc	General	F	NR								
Seibu Holdings Inc.	General	F	NR								
Skylark Co., Ltd.	General	F	NR								
Zensho Holdings Co., Ltd.	General	F	NR								
Infrastructure											
Aeon Mall Co., Ltd.	General	N/S	NR							Non public	
Chiyoda Corporation	General	F	NR								
Daiwa House Industry Co., Ltd.	General	A-	AQ	0%	3	~1%	Yes(r)	Director on board	Supplier, Customer /Other	Water-related	Brand/product, Company-wide, Site/facility
Iida Group Holdings	General	F	NR								
Kajima Corporation	General	C	AQ	0%	4	100%	Yes(r)	President	Customer /Other	In 2 years	Company-wide
KYUDENKO	General	F	NR								
Osaka Gas Co., Ltd.	O&G	F	AQ								
Panasonic Homes Co., Ltd.	General	SA	SA								
Sekisui Chemical Co., Ltd.	General	A-	AQ	2.7%	8	1-25%	Yes(r)	CEO	Customer /Other	Water-related	Basin, Company-wide, Site/facility
Sekisui House, Ltd.	General	B-	AQ	0.4%	5	1-25%	Yes(r)	CEO	In 2 years	Water-related	Country
Taisei Corporation	General	F	AQ								
Toho Gas Co., Ltd.	O&G	F	NR								
Tokyo Gas Co., Ltd.	O&G	A-	DP	0%	7	1-25%	Yes(r)	Director on board	Supplier	Not water-related	Activity, Business, Company-wide, Site/facility
Manufacturing											
Advantest Corporation	General	C	AQ		No risks	No	C-Suite			In 2 years	Company-wide
Aica Kogyo Co Ltd	Chemicals	C-	AQ	21%	No risks	No	No		In 2 years	In 2 years	No target/goal
Air Water Inc.	Chemicals	F	AQ								
Aisin Seiki Co., Ltd.	General	C	AQ	18.36%	14	1-25%	Yes	Director on board	Supplier, Customer /Other	Water-related	Company-wide, Site/facility
Alps Electric Co., Ltd.	General	C	AQ								Non public
Amada Holdings, Ltd.	General	F	NR								
Asahi Kasei Corporation	Chemicals	B	AQ	0%	No risks	Yes(r)	Director on board			Not water-related	Brand/product, Company-wide, Site/facility
Azbil Corporation	General	B-	AQ	11.01%	1	1-25%	Yes	C-Suite	In 2 years	Water-related	Company-wide
Brother Industries, Ltd.	General	B-	AQ	2.08%	No risks	Yes(r)	COO	Supplier		Water-related	Activity, Company-wide, Site/facility

Company	Questionnaire Sector ^a	2018 Score ^b	2017 Response status ^c	% withdrawn from stressed areas	Total number and % company-wide of facilities exposed to water risk		Identification of water-related opportunities ^d	Board level oversight of water-related issues	Engagement with value chain	Water-related outcomes from climate-related scenario analysis ^e	Water-related targets and/or goals
Calsonic Kansei Corporation	General	B	AQ					Non public			
Canon Inc.	General	B-	AQ	0%	1	1-25%	Yes(r)	CFO	Supplier	In 2 years	Company-wide, Site/facility
Casio Computer Co., Ltd.	General	C	AQ	Not relevant		No risks	No	No	No engagement	No analysis	Activity
Daicel Corporation	Chemicals	C	AQ					Non public			
Daifuku Co., Ltd.	General	F	NR								
Daihatsu Motor Co., Ltd.	OEMs	B-	AQ					Non public			
Daikin Industries, Ltd.	General	B-	AQ	0.74%	2	~1%	Yes(r)	No	Supplier	Water-related	Company-wide
Denka Company Limited	Chemicals	F	NR								
Denso Corporation	General	B-	AQ					Non public			
DIC Corporation	Chemicals	B-	AQ					Non public			
DISCO Corporation	General	D	AQ	Not relevant	13	100%	Yes(r)	No	No engagement		No target/goal
DMG Mori Seiki Co., Ltd.	General	F	NR								
Ebara Corporation	General	D	AQ					Non public			
EXEDY Corporation	General	B-	AQ					Non public			
Fanuc Corporation	General	D	AQ					Non public			
FP Corporation	Chemicals	F	NR								
Fuji Electric Co., Ltd.	General	C	AQ	2.1%	1	1-25%	Yes(r)	No	No engagement	In 2 years	Company-wide
FUJIFILM Holdings Corporation	General	B-	AQ	3.5%	5	1-25%	Yes(r)	CSO	Supplier, Customer /Other	Water-related	Company-wide
Fujikura Ltd.	General	B-	AQ	Not relevant	2	1-25%	No	President		Water-related	Company-wide
Fujitsu General Limited	General	F	NR								
Furukawa Electric Co., Ltd.	General	B-	AQ					Non public			
Glory Ltd.	General	C	AQ			No risks	No	No		No analysis	No target/goal
GS Yuasa Corporation	General	C	AQ	Not monitored		No risks	No	Director on board	No engagement	No analysis	Business
Heiwa Corporation	General	F	NR								
Hino Motors, Ltd.	OEMs	B-	AQ	40%	3	26-50%	Yes(r)	President	Supplier	In 2 years	Company-wide
Hirose Electric Co., Ltd.	General	F	AQ								
Hitachi Chemical Company, Ltd.	Chemicals	C	AQ	18%	81	100%	Yes(r)	President	In 2 years	Not water-related	Company-wide
Hitachi Construction Machinery Co., Ltd.	General	B-	AQ	29.35%	5	1-25%	Yes(r)	Other	Supplier, Customer /Other	Water-related	Company-wide
Hitachi High-Technologies Corporation	General	F	NR								
Hitachi Kokusai Electric Inc	General	C	AQ	Not monitored		No risks	No	Other	In 2 years	No analysis	Activity
Hitachi, Ltd.	General	B	AQ	3%	3	1-25%	Yes(r)	President	Supplier	In 2 years	Activity, Company-wide, Site/facility
Honda Motor Company	OEMs	B-	AQ					Non public			
HORIBA, Ltd.	General	C	AQ	Not relevant	26	26-50%	Yes	Other		In 2 years	Company-wide
Hoshizaki Electric Co., Ltd.	General	F	NR								
Ibiden Co., Ltd.	General	C	AQ	8%	2	1-25%	Yes(r)	No	Supplier, Customer /Other	No analysis	Company-wide
IHI Corporation	EPM	F	DP								
Isuzu Motors Limited	OEMs	B-	AQ	Not relevant	2	100%	Yes(r)	Director on board	Supplier	In 2 years	Activity, Site/facility

Company	Questionnaire Sector ^a	2018 Score ^b	2017 Response status ^c	% withdrawn from stressed areas	Total number and % company-wide of facilities exposed to water risk		Identification of water-related opportunities ^d	Board level oversight of water-related issues	Engagement with value chain	Water-related outcomes from climate-related scenario analysis ^e	Water-related targets and/or goals
Japan Aviation Electronics Industry, Limited	General	F	NR								
Japan Display Inc.	General	C	AQ	Not relevant	8	100%	Yes	Board chair	In 2 years	In 2 years	Company-wide
JSR Corporation	Chemicals	B	AQ	Not relevant	5	26-50%	Yes(r)	Director on board	Supplier	In 2 years	Company-wide, Site/facility
JTEKT Corporation	EPM	B-	AQ	1.34%	5	1-25%	Yes(r)	President	Supplier, Customer /Other	In 2 years	Company-wide
Kaneka Corporation	Chemicals	F	NR								
Kansai Paint Co., Ltd.	Chemicals	F	NR								
KAO Corporation	General	A	AQ	21%	8	1-25%	Yes(r)	CEO	Supplier, Customer /Other	Water-related	Business, Company-wide, Site/facility
Kawasaki Heavy Industries, Ltd.	General	F	AQ								
Keyence Corporation	General	F	NR								
Kobayashi Pharmaceutical Co., Ltd.	General	F	NR								
Koito Manufacturing Co., Ltd.	General	C	AQ					Non public			
Komatsu Ltd.	General	A-	AQ	8%	3	1-25%	Yes(r)	CEO		Water-related	Company-wide, Country, Site/facility
Konica Minolta, Inc.	General	C	AQ	3.6%	1	~1%	Yes(r)	CFO	Supplier	Water-related	Company-wide
KOSE Corporation	General	N/S	NR	Not relevant	No risks		No	No			No target/goal
Kubota Corporation	General	A-	AQ	36.96%	26	26-50%	Yes(r)	Director on board, President	Supplier	Water-related	Business, Company-wide, Site/facility
Kuraray Co., Ltd.	Chemicals	F	DP								
Kurita Water Industries Ltd.	General	C	AQ	Not relevant	No risks		No	Director on board	Customer /Other	In 2 years	Company-wide
Kyocera Corporation	General	B	AQ					Non public			
Lintec Corporation	Chemicals	C	AQ	100%	No risks		No	President	No engagement	No analysis	Other
Lion Corporation	General	F	NR								
Mabuchi Motor Co., Ltd.	General	F	NR								
Makita Corporation	General	F	NR								
Mazda Motor Corporation	OEMs	B-	AQ	10%	9	76-99%	Yes(r)	CEO	Customer /Other	Water-related	Company-wide
Meidensha Corporation	General	C	Not targeted	0%	0	~1%	Yes(r)	President, CSO	Customer /Other	In 2 years	Company-wide
MinebeaMitsumi Inc.	General	B	NR	4%	8	76-99%	No	CEO	Supplier	In 2 years	Company-wide
Mitsubishi Chemical Holdings Corporation	Chemicals	A-	AQ	54%	5	~1%	Yes(r)	CEO	Supplier, Customer /Other	Water-related	Activity, Brand/product, Business, Company-wide, Site/facility
Mitsubishi Electric Corporation	General	A	AQ	1%	3	1-25%	Yes(r)	President	Supplier, Customer /Other	Water-related	Business, Company-wide, Site/facility
Mitsubishi Gas Chemical Company, Inc.	Chemicals	C	AQ	Not relevant	No risks		No	Director on board, President		In 2 years	No target/goal
Mitsubishi Heavy Industries, Ltd.	General	F	AQ					Non public			
Mitsubishi Motors Corporation	OEMs	B-	NR	20.07%	No risks		Yes(r)	No	Supplier, Customer /Other	In 2 years	Company-wide
Mitsui Chemicals, Inc.	Chemicals	B-	AQ	0%	0	~1%	Yes(r)	No	Supplier	Water-related	Company-wide

Company	Questionnaire Sector ^a	2018 Score ^b	2017 Response status ^c	% withdrawn from stressed areas	Total number and % company-wide of facilities exposed to water risk		Identification of water-related opportunities ^d	Board level oversight of water-related issues	Engagement with value chain	Water-related outcomes from climate-related scenario analysis ^e	Water-related targets and/or goals
Mitsui Engineering & Shipbuilding Co Ltd	OEMs	F	NR								
Miura Co., Ltd.	General	F	NR								
Murata Mfg. Co.	General	B	AQ	2%	2	1-25%	Yes(r)	Director on board	Supplier	In 2 years	Company-wide
Nabtesco Corporation	General	A	AQ	0.06%		No risks	Yes(r)	CEO		Not water-related	Company-wide, Country, Site/facility
NGK Insulators, Ltd.	General	B-	AQ					Non public			
NGK Spark Plug Co., Ltd.	General	D	AQ			No risks	No	CEO	No engagement	Not water-related	Activity, Basin, Business, Company-wide, Country, Site/facility
NHK Spring Co., Ltd.	General	F	AQ								
Nidec Corporation	General	D	AQ	30%	55	1-25%	No	No	In 2 years	In 2 years	Company-wide
Nifco Inc.	General	F	NR								
Nikon Corporation	General	B	AQ	0%	6	26-50%	Yes(r)	Board chair	Supplier	Water-related	Company-wide, Site/facility
Nippon Electric Glass Co., Ltd.	General	F	NR								
Nippon Kayaku Co., Ltd.	Chemicals	C	AQ	Not monitored	4	1-25%	Yes(r)	Board chair	No engagement	Water-related	Business
Nippon Paint Holdings Co., Ltd.	Chemicals	F	NR								
Nippon Shokubai Co., Ltd.	Chemicals	D	AQ					Non public			
Nissan Chemical Industries, Ltd.	Chemicals	B	AQ	Not relevant	1	1-25%	Yes(r)	President	Supplier	In 2 years	Activity, Company-wide, Site/facility
Nissan Motor Co., Ltd.	OEMs	B	AQ	5.5%	3	1-25%	Yes(r)	Director on board	Supplier, Customer /Other	In 2 years	Business, Company-wide, Site/facility
Nissan Shatai Co., Ltd.	OEMs	F	NR								
Nisshinbo Holdings Inc.	General	D	AQ	Not monitored		No risks	No	No		No analysis	No target/goal
Nitto Denko Corporation	Chemicals	B-	AQ	3.46%	2	1-25%	Yes(r)	Director on board	In 2 years	In 2 years	Business, Company-wide, Site/facility
NOK Corporation	General	C	AQ	37%	32	100%	Yes(r)	Board chair	Supplier	In 2 years	Company-wide
NSK Ltd.	General	C	AQ	3.38%	6	1-25%	Yes(r)	COO	Supplier, Customer /Other	In 2 years	Company-wide
NTN Corporation	General	B-	AQ			No risks	No	C-Suite		In 2 years	Company-wide
Oji Holdings Corporation	P&F	B-	AQ					Non public			
Okuma Corporation	General	F	NR								
OMRON Corporation	General	B	AQ	9%	2	1-25%	Yes(r)	Board chair	Supplier	Water-related	Company-wide
OSG Corporation	General	F	NR								
Panasonic Corporation	General	B-	AQ					Non public			
Pigeon Corp	General	F	NR								
Pola Orbis Holdings Inc.	General	F	AQ								
Renesas Electronics Corporation	General	F	AQ								
Rengo Co., Ltd.	P&F	C	AQ	Not relevant		No risks	Yes(r)	Director on board	No engagement	No analysis	Site/facility
Ricoh Co., Ltd.	General	B	AQ	19.77%	2	1-25%	Yes	CEO	Supplier	Not water-related	Brand/product, Company-wide, Site/facility
Rinnai Corporation	General	F	NR								

Company	Questionnaire Sector ^a	2018 Score ^b	2017 Response status ^c	% withdrawn from stressed areas	Total number and % company-wide of facilities exposed to water risk	Identification of water-related opportunities ^d	Board level oversight of water-related issues	Engagement with value chain	Water-related outcomes from climate-related scenario analysis ^e	Water-related targets and/or goals	
Rohm Co., Ltd.	General	B-	AQ	57.71%	7	26-50%	No	Director on board	No engagement	In 2 years	Company-wide
Sankyo Co., Ltd.	General	F	NR								
Sanwa Holdings Corporation	General	F	NR								
SCREEN Holdings CO., Ltd.	General	B-	AQ	0%	2	1-25%	Yes(r)	Director on board	Customer /Other	Water-related	Brand/product
Seiko Epson Corporation	General	B	AQ					Non public			
Sharp Corporation	General	C	AQ	0%	2	1-25%	Yes(r)	C-Suite	Customer /Other	In 2 years	Company-wide
Shin-Etsu Chemical Co., Ltd.	Chemicals	D	AQ	79.4%	38	1-25%	Yes(r)	Director on board	Supplier	In 2 years	Company-wide
Shiseido Co., Ltd.	General	C	AQ	2.7%	3	1-25%	Yes(r)	CSO	In 2 years	Water-related	Company-wide
Showa Denko K.K.	Chemicals	Private	NR					Non public			
SMC Corporation	General	N/S	NR					Non public			
Sony Corporation	General	B	AQ	0.9%	No risks	Yes(r)	Other	Supplier, Customer /Other	Not water-related		Activity, Company-wide, Site/facility
Stanley Electric Co., Ltd.	General	F	AQ								
SUBARU CORPORATION	OEMs	F	AQ								
Sumco Corporation	General	F	NR								
Sumitomo Chemical Co., Ltd.	Chemicals	B	AQ	0.1%	2	1-25%	Yes(r)	President	Customer /Other	In 2 years	Company-wide, Country, Site/facility
Sumitomo Electric Industries, Ltd.	General	C	AQ	1.3%	9	1-25%	Yes(r)	Director on board	Customer /Other	Not water-related	Company-wide
Sumitomo Heavy Industries, Ltd.	General	B-	AQ		30	76-99%	Yes(r)	CEO	Supplier	In 2 years	Company-wide
Suzuki Motor Corporation	OEMs	C	AQ					Non public			
Tadano Ltd	General	F	NR								
Taiyo Nippon Sanso Corporation	Chemicals	SA	SA								
Taiyo Yuden Co., Ltd.	General	F	AQ								
TANAX, INC.	P&F	C	AQ	2%	7	26-50%	Yes(r)	CEO	Supplier	Water-related	Company-wide
TBM, LTD	General	B-	AQ		No risks	Yes(r)	CEO		Not water-related		Activity, Brand/product, Company-wide
TDK Corporation	General	D	AQ	5.32%	7	1-25%	Yes	President	Supplier	Water-related	Activity, Business, Company-wide, Country, Site/facility
Teijin Ltd.	Chemicals	D	AQ					Non public			
The Japan Steel Works, Ltd.	General	F	NR								
THK Co., Ltd.	General	C	AQ	Not monitored	No risks	No	President	Supplier	No analysis	No target/goal	
Tokai Rika Co., Ltd.	General	C	AQ					Non public			
Tokyo Electron Ltd.	General	B-	AQ	3%	4	76-99%	Yes(r)	Director on board	Supplier, Customer /Other	Water-related	Brand/product, Company-wide
Topcon Corp	General	F	NR								
Toray Industries, Inc.	Chemicals	B	AQ	Not relevant	4	26-50%	Yes(r)	Director on board	No engagement	Water-related	Activity, Brand/product, Business, Company-wide, Site/facility
Toshiba Corporation	General	C	AQ	Not relevant	0	~1%	Yes(r)	C-Suite	Supplier	Water-related	Company-wide
Tosoh Corporation	Chemicals	F	NR								
Toto Ltd.	General	B-	AQ	11.9%	5	1-25%	Yes(r)	President	Supplier, Customer /Other	Water-related	Company-wide

Company	Questionnaire Sector ^a	2018 Score ^b	2017 Response status ^c	% withdrawn from stressed areas	Total number and % company-wide of facilities exposed to water risk		Identification of water-related opportunities ^d	Board level oversight of water-related issues	Engagement with value chain	Water-related outcomes from climate-related scenario analysis ^e	Water-related targets and/or goals
Toyo Seikan Group Holdings, Ltd.	General	C	AQ	Not relevant	No risks		No	President	No engagement	In 2 years	Company-wide
Toyoda Gosei	General	B	AQ	5.1%	5	1-25%	Yes(r)	President	Supplier, Customer /Other	In 2 years	Business, Company-wide, Site/facility
Toyota Boshoku Corporation	General	B	AQ					Non public			
Toyota Industries Corporation	OEMs	A	AQ	16%	1	1-25%	Yes(r)	Director on board	Supplier	In 2 years	Business, Company-wide, Site/facility
Toyota Motor Corporation	OEMs	A-	AQ	16%	1	1-25%	Yes(r)	Director on board	Supplier	Not water-related	Business, Company-wide, Site/facility
TS Tech Co.,Ltd.	General	C	AQ					Non public			
Ube Industries, Ltd.	Chemicals	D	AQ					Non public			
Uni-Charm Corporation	General	C	AQ		No risks		Yes(r)	Other	Supplier	Not water-related	Company-wide
Ushio Inc.	General	F	NR								
Yamaha Corporation	General	B-	AQ	0%	No risks		No	Director on board	Supplier	Water-related	Company-wide
Yamaha Motor Co., Ltd.	OEMs	C	AQ	13.38%	1	1-25%	Yes(r)	Director on board	Supplier	Water-related	Country
Yaskawa Electric Corporation	General	F	NR								
Yokogawa Electric Corporation	General	B	AQ	25%	1	1-25%	Yes(r)	Board chair	Supplier	Not water-related	Activity, Business, Company-wide
Zeon Corporation	Chemicals	C	AQ	Not monitored	No risks		Yes(r)	President		No analysis	No target/goal
Materials											
AGC Inc.	General	B	AQ	0.4%	0	~1%	Yes(r)	CEO	Customer /Other	In 2 years	Basin, Business, Company-wide, Site/facility
Bridgestone Corporation	General	B	AQ	0%	No risks		Yes(r)	CEO	Supplier	Not water-related	Business, Company-wide, Site/facility
Daido Steel Co., Ltd.	Steel	F	NR								
Dowa Holdings Co., Ltd.	M&M	F	NR								
Hitachi Metals, Ltd.	Steel	B-	AQ					Non public			
JFE Holdings, Inc.	Steel	B	DP					Non public			
Kobe Steel., Ltd.	Steel	C	AQ					Non public			
LIXIL Group Corporation	General	A	AQ	1.64%	6	1-25%	Yes(r)	Director on board	Supplier, Customer /Other	Water-related	Company-wide, Country, Site/facility
Maruichi Steel Tube Ltd.	M&M	F	NR								
Nippon Paper Industries Co Ltd	P&F	C	AQ					Non public			
Nippon Sheet Glass Company, Ltd	General	B-	AQ					Non public			
Nippon Steel & Sumitomo Metal Corporation	Steel	B-	AQ					Non public			
Nisshin Steel Holdings Co., Ltd.	Steel	F	NR								
Sumitomo Metal Mining Co., Ltd.	M&M	B	AQ	7%	2	1-25%	Yes(r)	Other	Supplier	No analysis	Company-wide, Site/facility
Sumitomo Osaka Cement Co., Ltd.	Cement	N/S	NR	Not relevant	No risks		No	No			No target/goal
Sumitomo Rubber Industries, Ltd.	General	C	AQ	12%	5	1-25%	Yes(r)	President	In 2 years	No analysis	Company-wide, Site/facility
Taiheiyo Cement Corporation	Cement	C	AQ					Non public			
Toyo Tire & Rubber Co Ltd	General	B-	AQ	4%	3	1-25%	No	C-Suite	In 2 years	In 2 years	Site/facility

Company	Questionnaire Sector ^a	2018 Score ^b	2017 Response status ^c	% withdrawn from stressed areas	Total number and % company-wide of facilities exposed to water risk	Identification of water-related opportunities ^d	Board level oversight of water-related issues	Engagement with value chain	Water-related outcomes from climate-related scenario analysis ^e	Water-related targets and/or goals
Yamato Kogyo Co., Ltd.	Steel	F	NR							
Yokohama Rubber Company, Limited	General	B	AQ	19%	8	26-50%	Yes(r)	Director on board	Supplier	Water-related Company-wide
Mineral extraction										
Mitsubishi Materials Corporation	M&M	C	AQ	Not monitored	22	1-25%	No	President		No analysis Other
Power generation										
Chubu Electric Power Co., Inc.	EU	F	NR							
Electric Power Development Co.,Ltd (J-POWER)	EU	F	NR							
Hokkaido Electric Power Co., Inc.	EU	F	NR							
Hokuriku Electric Power Company	EU	F	NR							
Kyushu Electric Power Co Inc	EU	B-	DP					Non public		
Shikoku Electric Power Co., Inc.	EU	F	NR							
The Chugoku Electric Power Company	EU	F	NR							
The Kansai Electric Power Co., Inc.	EU	F	NR							
The Tokyo Electric Power Company Holdings, Inc (TEPCO)	EU	B	AQ	0%	1	~1%	Yes(r)	President	Supplier	Not water-related Basin, Brand/ product, Business, Company-wide, Site/facility
Tohoku Electric Power Co., Inc.	EU	F	NR							
Retail										
ABC-Mart, Inc.	General	F	NR							
Adastria Co., Ltd.	General	F	NR							
Aeon Co., Ltd.	General	N/S	NR					Non public		
Ain Holdings Inc	General	F	NR							
Aoyama Trading Co., Ltd.	General	F	NR							
Bic Camera Inc	General	D	AQ	Not monitored	No risks	No	No	No engagement	No analysis	No target/goal
COSMOS Pharmaceutical Corporation	General	F	NR							
Don Quijote Holdings Co., Ltd.	General	F	NR							
FamilyMart UNY Holdings Co., Ltd.	General	F	NR							
Fast Retailing Co., Ltd.	General	C	AQ	Not relevant	45	26-50%	Yes(r)	Director on board, Board chair, CFO, Other	Supplier	In 2 years Brand/product, Company-wide, Site/facility
H2O Retailing Corporation	General	F	NR							
Izumi Co., Ltd.	General	F	NR							
J. Front Retailing Co., Ltd.	General	F	NR							
Kusuri No Aoki Holdings	General	F	NR							
Lawson, Inc.	General	F	NR							
Matsumotokiyoshi Holdings Co., Ltd.	General	F	NR							
Nitori Holdings Co., Ltd.	General	F	NR							
Ryohin Keikaku Co., Ltd.	General	F	NR							
Seria Co Ltd	General	F	NR							
Seven & I Holdings Co., Ltd.	General	F	NR							
Shimamura Co., Ltd.	General	F	NR							
Sugi Holdings Co., Ltd.	General	F	NR							
Sundrug Co., Ltd.	General	F	NR							
Tsuruha Holdings Inc.	General	N/S	NR	Not monitored	No risks	No	No			No target/goal
Welcia Holdings Co Ltd	General	F	NR							

Company	Questionnaire Sector ^a	2018 Score ^b	2017 Response status ^c	% withdrawn from stressed areas	Total number and % company-wide of facilities exposed to water risk	Identification of water-related opportunities ^d	Board level oversight of water-related issues	Engagement with value chain	Water-related outcomes from climate-related scenario analysis ^e	Water-related targets and/or goals
Services										
Autobacs Seven Co., Ltd.	General	F	NR							
BANDAI NAMCO Holdings Inc.	General	D	AQ	Not monitored	No risks	No	No		No analysis	No target/goal
Canon Marketing Japan Inc.	General	SA	SA							
Fujitsu Ltd.	General	B	AQ	9%	No risks	Yes(r)	CEO	Supplier, Customer /Other	Not water-related	Activity, Business, Company-wide, Site/facility
ITOCHU Corporation	General	B-	AQ				Non public			
Mitsui & Co., Ltd.	General	B-	AQ				Non public			
Nagase & Co., Ltd.	General	C	AQ	Not relevant	No risks	No	Director on board	No engagement	No analysis	No target/goal
NEC Corporation	General	B	AQ	Not relevant	0 ~1%	Yes(r)	CEO	Supplier	Water-related	Company-wide, Site/facility, Other
Secom Co., Ltd.	General	C	AQ		No risks	Yes(r)	No		In 2 years	No target/goal
Sega Sammy Holdings Inc.	General	D	AQ		No risks	No	No		No analysis	Activity
Sojitz Corporation	General	N/S	NR				Non public			
Sumitomo Corporation	General	B	AQ				Non public			
Toppan Printing Co., Ltd.	General	C	AQ	Not monitored	No risks	Yes(r)	C-Suite	Customer /Other	In 2 years	Company-wide
Toyota Tsusho Corporation	General	B	AQ				Non public			
Transportation services										
H.I.S.Co.,Ltd.	General	F	NR							
Keihan Electric Railway Co., Ltd.	TS	F	NR							
Nankai Electric Railway Co., Ltd.	TS	A-	AQ	69%	2 51-75%	Yes(r)	CSO		In 2 years	Brand/product, Business, Company-wide
PARK24 Co., Ltd.	General	F	AQ							

- a EPM: Transport Engine Part Manufacturers
EU: Electric Utilities
FBT: Food, Beverage & Tobacco
M&M: Metals & Mining
O&G: Oil & Gas
OEMs: Transport Original Equipment Manufacturer
P&F: Paper & Forestry
TS: Transport Services
- b N/S: Not Scored
Private: Score is not public
SA: See Another
- c AQ: Answered Questionnaire
DP: Declined to Participate
NR: Not Responded
SA: See Another
- d Yes(r): Opportunities are identified and realized
Yes: Opportunities are identified but not yet realized
No: Opportunities are not identified
- e Water-related: Climate-related scenario analysis is used and water-related outcome is identified
Not water-related: Climate-related scenario analysis is used but no water-related outcome is identified
In 2 years: Climate-related scenario analysis is not used but will be anticipated within the next two years
No analysis: Climate-related scenario analysis is not used and no plans for using in the next two years

Report writers and scoring partners



Scoring partner



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