Mitsui & Co. Global Strategic Studies Institute Monthly Report June 2023

### AN ENCOURAGEMENT OF WATER AND LAND SUSTAINABILITY ASSESSMENT

# - NEXT SET OF CORPORATE ACTIONS REQUIRED, FOLLOWING THE CALCULATION OF GHG EMISSIONS -

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#### SUMMARY

- Without water and land, many businesses would not be viable. However, water- and land-related problems, such as water shortages and land degradation, are occurring around the world and are affecting the way businesses operate. To address these issues, frameworks to assess water and land use are being developed.
- The four leading nonprofit organizations developing such frameworks are SBTN, TNFD, CDP, and the Capitals Coalition. Each agency is developing a framework in a form that is easy to use and optimized for its intended users: SBTN for evaluators of science-based goal setting, TNFD for evaluators of financial disclosures and risk, etc.
- Going forward, companies will pursue technology development and activities to reduce the environmental impact of their operations throughout the value chain to address the problems pointed out from water and land sustainability assessments. Moreover, it is anticipated that these efforts will create the potential for new business opportunities.

#### 1. ALL BUSINESSES ARE IMPACTED BY WATER AND LAND USE

When we think of businesses that use water and land for production, we tend to think of agriculture and the manufacturing of beverages and food products, but many manufacturing and service businesses, such as mineral mining, semiconductor manufacturing, and the cooling of furnaces in thermal power plants, would not exist without water and land. However, a variety of issues related to water and land are becoming apparent around the world. This report first discusses the impact of these problems on business.

#### 1-1. Business risks related to water

While developed countries with good infrastructure, including Japan, impose restrictions on water intake and water supply in years of low rainfall or in areas where rainfall is naturally low to begin with, these restrictions rarely have a serious impact on people's lives. However, 20% of the world's major river basins are facing water shortages, and that led to US\$38.5 billion in business losses in 2018. The water supply crisis is ranked the fourth most serious social risk over the next 10 years<sup>1</sup>.

<sup>&</sup>lt;sup>1</sup> Science Based Targets Network website, <u>Freshwater hub</u> (accessed June 6, 2023; same for all online references hereafter)

#### Mitsui & Co. Global Strategic Studies Institute Monthly Report June 2023

Water-related business risks are not limited to physical risks such as damage to agriculture and livestock industries or plant shutdowns due to water shortages. Attention should also be paid to regulatory risk, reputational risk, market changes, and technological risk, as detailed in Figure 1.

Type of risk	Explanation of risk	Specific and possible cases
Physical risk	Businesses that use water for physical purposes, such as cooling raw materials or equipment, will not be able to continue operations.	Drought-induced crop failures in agriculture, etc. One example is when the drought in Taiwan in 2021 threatened to shut down several of TSMC's semiconductor manufacturing plants.
Regulatory risk	Tighter government regulation of water supply and drainage will make it difficult for the businesses to continue operations. There is also a risk of higher costs and fines required for water supply and drainage.	In the US, fluorinated chemicals, which are persistent and harmful to the human body and absorbed by the body via water, have been detected in the blood of citizens, leading to stricter standards for the allowable concentration of the said substances in water discharged by manufacturing plants. In connection with this, 3M announced that it will stop manufacturing fluorinated compounds that are subject to the regulation.
Reputational risk	Companies that operate in areas where water is scarce and those that release contaminated water into the environment will be viewed as problematic from environmental and humanitarian perspectives, resulting in boycotts of their goods/services and the withdrawal of investments.	If a company operates without adequate disclosure to the community and activists, misinformation could be spread through social media and other means, leading to boycotts of the company's products, even if there are no actual environmental or humanitarian issues.
Market changes	Changes in purchasing behavior due to increased consumer awareness, such as consumers choosing not to buy products that have been manufactured without attention to water resource management, will make existing products unsaleable.	As activists and influencers become more active in informing and educating the public of the issues, an increasing number of consumers will choose not to buy products unless companies are committed to preserving water resources.
Technology risk	The emergence of technologies that use water more sustainably or help reduce its use will make it difficult to continue operation of businesses for which the scarcity of water presented an opportunity.	If deserts can be converted into farmland through innovative technologies such as seawater desalination systems and soil improvement, exporters who had previously exported crops to areas where agriculture was not possible due to water shortages will lose their export markets.

#### Figure 1: Business risks related to water

Source: Compiled by MGSSI based on various materials

#### 1-2. Business risks related to land

Actions and events that prevent the sustainable use of land results in what is called land degradation. It has been pointed out that such land degradation is a business risk. Specifically, the conversion of natural forests and wetlands to farmland or cleared land for business use causes deforestation, and the discharge of wastewater contaminated with toxic substances makes the surrounding land uninhabitable, resulting in the inability to continue business operations. Globally, land degradation disadvantages 3.2 billion people, and 10% of the world economy's annual GDP is lost<sup>2</sup> therefrom. In addition, greenhouse gas (GHG) emissions from land uses in agriculture, forestry, and other activities account for 18.4% of global GHG emissions<sup>3</sup> and have a significant impact on climate change.

#### WATER AND LAND SUSTAINABILITY ASSESSMENT FRAMEWORKS AND THE

#### **ORGANIZATIONS INVOLVED IN FRAMEWORK DEVELOPMENT**

Frameworks are being developed to address these water and land issues and to balance sustainability and business development. The frameworks will allow for the quantitative assessment of water and land so that GHG emissions are measured and analyzed to set quantitative targets to combat climate change. This section of the report describes these frameworks and the entities that are involved in development.

<sup>&</sup>lt;sup>2</sup> Science Based Targets Network website, Land hub

<sup>&</sup>lt;sup>3</sup> Our World in Data website, <u>Emissions by sector</u>

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#### 2-1. Relationship between major development organizations and the frameworks

The four leading organizations developing sustainability assessment frameworks for water and land are the Science Based Targets Network (SBTN), the Taskforce on Nature-related Financial Disclosures (TNFD), the CDP (former Carbon Disclosure Project)<sup>4</sup>, and the Capitals Coalition, all non-profit organizations. Some frameworks serve as the basis for quantitative analysis of specific projects, while others contribute to strategic planning and management policy formulation. SBTN has developed "Science Based Targets (SBT) for Nature," which covers the former. Three organizations other than SBTN are participating in or co-developing SBT for Nature as partners (Figure 2), and the results are provided in a form that is optimized for easy use by the intended users.



#### Figure 2: Relationships between organizations developing frameworks for water and land assessment

\*TNFD recommends that the water and land data collection and valuation methods jointly developed by the SBTN be used to prepare the basic data for nature-related financial disclosures. Source: Compiled by MGSSI based on various materials

#### 2-2. Details of each development organization

Below is an overview of the organizations involved in developing the frameworks.

#### • Science Based Targets Network: SBTN

SBTN is one of the organizations of the Global Commons Alliance<sup>5</sup> and, as mentioned above, is developing SBT for Nature. Intended uses of SBT for Nature include quantitative and more detailed assessments by industry in manufacturing and service settings. Therefore, companies that are considering the development or introduction of new technologies to reduce their environmental impact can use SBT for Nature to conduct science-based assessments<sup>6</sup>.

In developing SBT for Nature, technical hubs have been created to lead the development of water and land assessment methodologies, and each is headed by World Wild Fund for Nature (WWF) experts in their respective fields.

<sup>&</sup>lt;sup>4</sup> Initially launched as the Carbon Disclosure Project, it has changed its official name to CDP, which was originally used as an

acronym, as it supports the disclosure of not only greenhouse gas emissions data but also water and land assessments since 2022. <sup>5</sup> A coalition of more than 70 international organizations working to achieve a sustainable society

<sup>&</sup>lt;sup>6</sup> SBTN believes that in addition to water and land, a framework should be developed for oceans and biodiversity in the future, but since quantitative assessment of oceans and biodiversity is more difficult, studies on water and land are being conducted first.

#### Mitsui & Co. Global Strategic Studies Institute Monthly Report June 2023

#### **Taskforce on Nature-Related Financial Disclosures: TNFD**

TNFD is an informal working group established at the initiative of the financial sector to develop the framework of the same name, the TNFD. As a risk management tool in business, it provides a format that allows natural capital, including water and land, to be incorporated into financial reports.

CDP

CDP is an international non-profit organization that operates a disclosure system for managing environmental impacts and has developed a framework of the same name, CDP. The CDP targets institutional investors who want to invest in companies that are proactive in addressing climate change, and assigns a score<sup> $\tau$ </sup> to companies they may be interested in investing in, allowing them to check the status of those companies' climate change-related disclosures. Beginning in 2022, a section on water and land was added to the questions asked of companies, and scoring began for these items in addition to those related to climate change.

#### **Capitals Coalition**

The Capitals Coalition is an organization launched by the World Business Council for Sustainable Development (WBCSD)<sup>8</sup> and released the Natural Capital Protocol in 2016. The organization focuses on educating all organizations, both for-profit and non-profit, about the importance of assessing the sustainability of natural capital and using it to make business decisions. The Natural Capital Protocol is a generic framework for all organizations and does not provide specific methods for quantification. Therefore, its main purpose is to deepen the understanding of and educate the leadership of the organization.

Framework	Developing organization	Supporting, cooperating companies	Target industries	Target environmental factors	Development status
Science Based Targets for Nature (SBT for Nature)	SBTN (WWF <sup>1</sup> , Capitals Coalition, CDP, and others participating as partners)	SBTN freshwater hub General Mills, Procter & Gamble, and Suntory participated in a pilot program SBTN land hub Currently seeking companies to participate in pilot program	In addition to food, beverages, agriculture (first release), cities (public works) may be included	Freshwater, land GHG (following SBTi <sup>2</sup> ) In the future, oceans, biodiversity	Guidelines announced in 2020. Details are under development with a target completion of 2025.
Taskforce on Nature- related Financial Disclosures (TNFD)	TNFD (informal working group <sup>3</sup> )	As of March 2023, 54 companies had participated in pilots. Kirin, AXA, and others have published their results as environmental reports.	Agriculture, food, mining and metals, energy, and financial institutions	Atmosphere, water (freshwater, seawater), land, biodiversity (consistent with SBTN)	Under development; v1.0 release scheduled for September 2023.
CDP	CDP	<ul> <li>In 2022, a questionnaire was sent to approximately 15,000 companies, and the response are being collected</li> <li>A total of 13 companies received A ratings in all areas — climate change, forestry, and water security. They were beiersfdorf AG, Danone, FIRMENICH SA, HP Inc., Kao, Klabin S/A, Lenzing AG, L'Oréal, LVMH, Metsa Board Corporation, Philip Moris International, Symrise AG, and UPM-Kymmene Corporation.</li> </ul>	All industries	Climate change, forests, water security	Development completed and updated annually. The latest questionnaire was released in January 2023.
Natural Capital Protocol	Capitals Coalition (WBCSD <sup>4</sup> , WWF, WRI <sup>5</sup> , etc.)	Deloitte, E&Y, KPMG, PwC	All industries	Natural capital (the natural resources of the earth. Examples include plants, animals, air, soil, and minerals)	First version published in 2016

#### Figure 3: Comparison of frameworks for water and land sustainability assessment (as of June 2023)

1 WWF: World Wildlife Fund. An international NGO and the world's largest conservation organization.

2 SBT: Science Based Target initiative. A framework for setting greenhouse gas emission reduction targets based on scientific evidence. Developed before SBT for Nature. 3 The taskforce was conceived at the 2019 World Economic Forum Annual Meeting (Davos) and established in September 2020 under the initiative of the global financial sector. 4 WBCSD: World Business Council for Sustainable Development. Established to propose a view on "sustainable development" from the business community at the 1992 UN Earth Summit. 5 World Resources Institute: A global non-profit research organization founded in 1982.

Source: Compiled by MGSSI based on various materials

<sup>&</sup>lt;sup>7</sup> Questionnaires are sent to companies and a score of A to D is assigned for their degree of commitment according to their responses, or F for no response.

<sup>&</sup>lt;sup>8</sup> The council was formed at the 1992 UN Earth Summit to propose a view on "sustainable development" from the business community.

#### 3. DEVELOPMENT STATUS OF SBT FOR NATURE

This section presents a detailed look at the development of SBT for Nature, which serves as the basis of the water and land sustainability assessment frameworks. The progress of development was unveiled by members of the SBT's water and land technical hubs at a workshop at GreenBiz23, a sustainability-related business conference held in Arizona, US, in February 2023, which this author attended.

At the workshop, an overview was provided of the first release of SBT for Nature and a development schedule (Figure 4). The industries covered in first release are food, beverages, and agriculture, but the final guidance, scheduled for publication in 2025, will be expanded to include all industries. In addition to companies from the three abovementioned industries, more than 180 others from a wide range of sectors, including retail, apparel, and chemicals, have participated in SBT for Nature's engagement program<sup>9</sup> (Figure 5). Although the first release will be used as the foundation for future versions, new items will be added and the amount of data required is more than that required for science-based climate targets. Those involved in the development advise that even if a company is not subject to the first release, it should start preparing now.

#### Figure 4: Development roadmap for SBT for Nature (water, land)

	2020-2022	2023	2024	2025	
Target industries	All industries (executive summary)	Food, beverages, agriculture	Food, beverages, and agriculture, as well as biofuels and forestry	All industries	
	<ul> <li>September 2020:</li> <li>SBTN initial guidance</li> </ul>	May 24: First release	Scheduled release of Version 1.0	Scheduled release of final version	
Development trends	•2021 Q2-Q4: Preliminary study <sup>1</sup> •November 2021: Review by experts <sup>2</sup> •September 2022- March 2023: Solicitation of comments from the public	Methodology coverage <sup>3</sup> : Ground surface water flow Groundwater (area model) Eutrophication Upstream segments of the value chain Water used in operations	Methodology coverage: Addi the first release Groundwater Toxic co Other water qu Down Freshwater Freshwater ecos Consideration of	Additions to items covered under iter (global model) c compounds · quality parameters winstream ater biodiversity cosystem conversion n of future scenarios	

1 Companies enter and test their data using tools that follow the methodology developed by SBTN

2 Reviews by the companies that participated in the preliminary study, the experts responsible for developing the study, and outside experts

3 Items to be quantified and detailed measurement methods

Source: Compiled by MGSSI based on various materials

<sup>&</sup>lt;sup>9</sup> A program in which SBTN offers companies and others the opportunity to participate in information sessions related to access to methods and tools under consideration with respect to setting up SBT for Nature.

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#### Figure 5: Participating companies in SBT for Nature engagement program (partial list)

Source: SBTN website (<u>https://sciencebasedtargetsnetwork.org/take-action-now/take-action-as-a-company/join-the-sbtn-corporate-engagement-program/corporate-engagement-program-members/</u>)

#### 3-1. SBTs for water sustainability

A preliminary validation study<sup>10</sup> to test the validation criteria of the SBT for water sustainability was conducted from April 2021 to June 2022, prior to the publication of the first release. The three companies that participated in this study (Suntory, General Mills, and Procter & Gamble) are shown in Figure 6. Each company set feasible goals after conducting an assessment of the entire value chain of their products and services. However, the assessment data required under the first release of the guidance will not be as exhaustive<sup>11</sup> as in the preliminary study. It was explained that this was decided to prevent a significant increase in the burden on corporate practitioners and to lower the hurdles to participation.

<sup>&</sup>lt;sup>10</sup> Here, the "preliminary validation study" collectively refers to the "preliminary test", in which companies input and test their own data into tools that follow the methodology of the framework developed by SBTN; the "expert review", in which the companies that conducted the preliminary tests, the experts in charge of developing the preliminary study, and outside experts review the outcomes; and the cycle from the development of improvement plans and implementation of remedial activities based on these plans.

<sup>&</sup>lt;sup>11</sup> Specifically, the data required under the first release of the preliminary study will be only that for the amount of freshwater intake and the nitrogen and phosphorus concentrations in the freshwater.

Figure 6: Case studies of three corporate participants in the SBT's pilot assessment of water sustainability

	Suntory	General Mills	Procter & Gamble					
Purpose of participation and awareness of issues	<ul> <li>In 2014, the company established the "Environmental Vision toward 2050", which focuses on water sustainability and climate change action. It then established the more specific "Environmental Targets toward 2030" to achieve the vision.</li> <li>Suntory participated in the pilot with the expectation that the scientific approach that it has been taking in its ongoing "Natural Water Sanctuary Initiative" to protect water resources and conserve biodiversity can be combined with the SBT freshwater methods to set more robust targets.</li> </ul>	<ul> <li>As a food manufacturer, the company is highly dependent on water in its business activities, including the cultivation of plants and animals that are the raw ingredients of its products. Recognizing that water risk has a financial impact on the company's business, General Mills pledged to regenerate water resources related to its business activities. It participated in the pilot with the hope of gaining insights to advance this commitment.</li> <li>Although the company adopted context-based targets (factoring the status of water resources at each site) as prepared by the UN Global Compact, it was unable to appropriately scale activities and track advancement due to insufficient quantification.</li> </ul>	In 2018, the company announced its Ambition 2030 Environmental Sustainability Goals. It collaborated with WRI to establish a quantitative target-setting process. The company participated in the pilot to align its own targets with best practices.					
Preliminary	Identify areas and locations that have the largest footprint in water sustainability across the entire value chain							
assessment	Conduct risk assessme	nts to gain awareness of the correlation between business	activities and water use					
	↓ Carry out improvement activities (plans) by prioritizing high-risk areas							
Results	•Targets were revised in December 2021 based on a prioritization ranking of high-risk activities needing improvement. •For the source of water used at the Toledo plant in Spain, the company has begun working with experts from a local university to obtain the data needed to set targets.	Of the water used in the company's value chain, 99% was found to be for uses other than its own manufacturing operations, and 85% of which is in agricultural water sourcing. The company came to understand that it should focus on responsible sourcing activities for water used in the upstream value chains in agriculture.     In areas at high risk of water scarcity, the company found that regenerative agriculture could contribute to reduce risk and have a positive impact.     General Mills applied the use of satellite technology to identify groundwater veins for evaluation in data-poor environments such as India. The company came to realize that ingenuity plays a key role in data acquisition.	<ul> <li>It was confirmed that the basic steps and processes of SBT for Nature are aligned with the "Setting Enterprise Water Targets", which is a process for setting water targets that was developed by the UN Global Compact and which P&amp;G was already following.</li> <li>The company was able to confirm the usefulness of data and information that it had accumulated so far.</li> </ul>					
Participating company's messages to other companies	The difficulty with water sustainability initiatives lies in the fact that different regions have different circumstances and challenges. As an analysis of the water issues on the land in question is needed to maintain water sustainability, it is worth making the investment to work with local experts.	Many companies are only reducing their own environmental impact, but based on this case study, General Mills hopes companies will look at activities outside of their own operations.	_					
ource: Compiled by MGSSI based on various materials								

#### 3-2. SBTs for land sustainability

SBTs for land sustainability are being developed in a manner that incorporates the existing guidance on assessing GHG emissions from the forest, land, and agriculture sectors (FLAG: Forest, Land and Agriculture), which was launched earlier as part of global climate mitigation measures. Unlike water, a preliminary evaluation by the cooperating firms will be conducted after the first release<sup>12</sup> is issued.

#### 4. CHALLENGES AND NEW OPPORTUNITIES HIGHLIGHTED BY WATER AND LAND

#### SUSTAINABILITY ASSESSMENTS

#### 4-1. Dealing with trade-offs through R&D

With water, land, and climate change, all environmental impacts are difficult to reduce simultaneously, and they often have a trade-off relationship. One example is the relationship between GHG emissions and water use. In terms of GHG emissions, when comparing disposable vs. reusable containers, the latter has a lower environmental impact. However, in terms of water use, disposable containers have less impact than reusable containers because of the water used for washing reusables.

Even if there are such trade-offs in the existing infrastructure and with current technology, visualizing the relationship can lead to solutions. For example, new technologies could be developed for diverting and reusing

<sup>&</sup>lt;sup>12</sup> The targets in the first release of the guidance envisions four points: 1) land-based GHG emissions that comply with the FLAG guidance, 2) no conversion of natural ecosystem, 3) land footprint reduction, and 4) landscape engagement.

the cleaning water used for washing reusables for other uses, and such new technologies could spark further innovations. In agriculture, the value of regenerative agriculture has been reassessed <sup>13</sup>, and in mining, sustainable mining is already being considered <sup>14</sup>.

#### 4-2. Cooperation throughout the value chain

As with the calculation of GHG emissions, for water and land as well, information sharing, joint analysis, and measures throughout the value chain are essential. This requires tools to share information while ensuring safety and reliability, both inside and outside a company. Since development of tools for calculating GHG emissions are already underway and the rules are becoming established to some extent, it is assumed that these tools will incorporate additional functions for inputting and analyzing data on water and land, in part to avoid overlaps of work.

#### 4-3. In Conclusion

For companies already committed to decarbonize, the assessment of water and land sustainability will be a new requirement, in addition to the calculation and reduction of their GHG emissions. However, as the evaluation of the frameworks highlights issues such as how to address trade-offs and information sharing, new business opportunities may arise through the development of technologies to provide solutions and support improvement activities throughout the value chain. Now that the first release of the SBT has been issued, it is time for companies to address water and land sustainability, as the next step following the calculation of GHG emissions. Finally, Figure 7 provides specific examples of risks and opportunities, focusing on the value chains in the food and agriculture, automotive and durable materials, and the information industries.

<sup>&</sup>lt;sup>13</sup> An example of regenerative agriculture being reassessed is corn cultivation in the US. In conventional corn cultivation, yields were known to decline due to continuous planting of fields with the same crop each year, and the emphasis was on developing corn and fertilizers that could be used for such farming practices. Meanwhile, it was known empirically that planting soybeans after harvesting corns increases the water retention and nutrient content of the land, so an experiment was conducted, in which corn and soybean cultivation was alternated with optimized application of fertilizer and pesticides. This resulted in the need for less water application than with continuous corn cultivation, and also resulted in an increase in both per-acre and per-year yields.

<sup>&</sup>lt;sup>14</sup> Until now, mining companies have not quantified the environmental impact of the large amount of water used in the process of land transformation (changing land use) or that associated with the extraction of minerals having usage value, although they have calculated treatment costs. However, unless the companies establish targets and measurements of effectiveness to quantify and minimize the environmental impact, and share this information with stakeholders, it will become increasingly difficult for them to continue operations due to the withdrawal of investments and decline of their stock prices. As a result, the value of sustainable mining, which reduces the environmental impact on water and land, is gaining greater recognition.

## Figure 7: Examples of industry-specific business risks and opportunities revealed through water and land sustainability assessments

Industry	Value chain	Risk	Opportunity
Food, agriculture	Energy Fertilizer Crops Processing Packaging Distribution Retail Consumption Disposal	Increase in water temperature due to discharge of plant cooling water Water use and land degradation during cultivation	Use of heat to cool wastewater
		Land degradation due to waste disposal	Reusables, recycling
		Increase in water temperature due to discharge of plant cleaning and cooling water	Purification by water treatment, cooling of wastewater by using heat
Automotive, durable materials		Water use in semiconductor manufacturing	Water treatment technologies to reduce actual usage volume
	Energy Raw Parts Assembly Distribution Usage Disposal Metals, Structures, battery, battery,	Water and land degradation during mining of metals (including battery raw materials)	Sustainable mining technologies to reduce degradation
	etc. semiconductors, etc.	Land degradation during use	Catalysts and other purification technologies
		Increase in water temperature and pollution due to discharge of cooling water from power plants and factories	Cooling of wastewater by using heat, purification by water treatment
Information	Energy Raw Devices Hardware Software Services Disposal	Water use in semiconductor manufacturing	Water treatment technologies to reduce actual usage volume
	Metals, Electronic Servers, Data centers, etc. chemicals, components, terminals, etc. semiconductors, etc.	Water and land degradation during metal mining	Sustainable mining technologies to reduce degradation
	etc.	Cooling of data centers	Use of heat

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