SDG water disclosure around the globe

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1 INTRODUCTION

With the 2030 Agenda, the United Nations (UN) introduced a set of 17 Sustainable Development Goals (SDGs) and 169 targets with the aim of improving social and environmental sustainability around the globe (UN, 2015). As outlined by the UN, "the SDGs represent a major opportunity for businesses to shape, steer, communicate and report their strategies, goals and activities, allowing them to capitalize on a range of benefits" (UNDP, n.d.). Despite extensive evidence existing of how companies discharge their accountability toward society in relation to ESG practices and on their corporate reporting choices (see Andrew & Baker, 2020 for a review of these studies), limited evidence exists on how businesses around the world are engaging with the SDGs and are reporting the relevant information to the public (e.g., Bose & Khan, 2022; Pizzi et al., 2021; Zampone et al., 2023).

This chapter aims to contribute to this research stream by focusing on water-related SDGs (SDG 6 and SDG 14) and exploring how companies disclose their commitment to the achievement of water-related SDGs in terms of the quantity and quality (tone, readability and length) of the related narrative disclosures. We analyse the water-related SDGs disclosures, in terms of quality and quantity, published in the corporate reports of 143 international companies operating in the period 2016–2020 in sectors characterised by high or medium operational sensitivity to water. SDG water-related disclosures were identified using the SDG 6 and SDG 14 keyword lists developed by Wang et al. (2023). We define a sentence as SDG water-related disclosure if the sentence contains at least one of the keywords from this dictionary. Results indicate a low engagement with these types of disclosures, which is concerning, considering the importance that water management has for sustainable development and the water risk that firms may face. They also indicate that firms seem to be keener to discuss more environmental aspects of water disclosure (SDG 14) than social aspects (SDG 6), contrasting with the results of previous studies (e.g., Bose & Khan, 2022). Our results also reveal that disclosures on water-related SDGs are biased, as firms tend to highlight more positive aspects of their water-related performance, and use texts that are more complex and difficult to understand. Overall, this evidence is in line with the impression management literature (Brennan et al., 2009; Muslu et al., 2019), which highlights that companies use more optimistic and complex disclosures to conceal information and confuse information users.

The remainder of the chapter is organised as follows. First, a brief description of the SDGs and water-related issues will be provided, together with an overview of the main studies on the associated reporting practices. This will be followed by a description of the research methodology of the study and a discussion of the main findings. Comments and conclusions will conclude the chapter.

2 AN OVERVIEW OF THE UN SDGS AND WATER MANAGEMENT REPORTING

In 2015, the UN member states adopted the 2030 Agenda for Sustainable Development, at the core of which there is the need "for action to tackle growing poverty, empower women and girls, and address the climate emergency" (UN, 2015). At the heart of this Agenda there are 17 Sustainable Development Goals (SDGs), which set 169 targets that aim to promote social prosperity while protecting the environment, by calling for action to end hunger, poverty and inequality; improve education, gender equality, water management, and clean energy uses; fight climate change and protect biodiversity (UN, 2015).

The UN emphasised that achieving the SDGs would require collaboration across governments, private and public sector organisations and civil society (Bebbington & Unerman, 2018). Companies have a big role to play in this. They are expected to reassess their purpose and look beyond the financial bottom line. Companies that align their strategy and purpose with the SDGs are likely to get competitive advantages since the SDGs are becoming increasingly important to investors (Paetzold et al., 2022). Disclosing information about the SDGs is therefore crucial for companies to show to investors and corporate stakeholders their commitment to social and environmental sustainability and the achievement of the SDGs. Despite this importance, a study conducted by KPMG (2017) found that only 43% of the world's 250 largest companies by revenue, based on the Fortune 500 ranking of 2016, explicitly reported on their contribution to the SDGs in the period 2016–2017. By contrast, PwC (2019) reported that nearly 72% of 1,141 large corporations across 31 countries and seven sectors mentioned the SDGs in their 2018 corporate reports. The study, however, also outlined that very few companies provide more specific disclosure on how they are aligning their strategy to the SDGs or on the specific SDG targets that they plan to achieve (PwC, 2019). Bose and Khan (2022), who examined SDG reporting over the period 2016–2019, found that companies' engagement with SDG disclosure is shallow. Only 8.40% of the 6,941 firm-year observations analysed disclosed information on SDG targets over the sample period, and most of this disclosure started in 2019. By contrast, the studies of Pizzi et al. (2021) and Zampone et al. (2023), which measured the engagement of companies with SDGs disclosure, using a disclosure index based on the GRI, provide a more positive picture showing that companies disclose relevant information for around one-third of the SDGs.

Interestingly, the study conducted by Bose and Khan (2022) also shows that social-related SDGs, such as SDG 8: Decent work and economic growth, SDG 5: Gender equality, SDG 3: Good health and well-being and SDG 2: Zero hunger, were the SDGs disclosed by the highest number of companies. However, environmental-related SDGs and water-related SDGs, such as SDG 6: Clean Water and Sanitation and SDG 14: Life Below Water were disclosed the least. This is despite the management of water-related natural resources, including oceans, seas and freshwater, being considered to be one of the major challenges faced globally to achieve sustainable development (UNGA, 2015). Access to water is at the centre of sustainable development: it is critical for supporting the processes that support all life on Earth, including human beings, industrial production and economic growth, and it is at the core of the adjustments in ecological, social and economic systems in response to climate change (UN, n.d.). Evidence on corporate water management disclosure is also limited. The few studies conducted in this area show that companies operating in the water industry tend to disclose more extensive information, which tends to be in line with water regulators' guidelines (Stray,

2008), whereas companies operating outside the water industry tend to provide more limited disclosure (Zeng et al., 2020; Zhang et al., 2021).

To our knowledge, studies on SDGs and water-related disclosure have focused mostly on evaluating the quantity of the information disclosed. No evidence has been provided in relation to the qualitative characteristics of these disclosures. This chapter aims to fill this gap by analysing the extent, tone, readability and length of water-related disclosures in relation to SDG 6 and SDG 14.

3 RESEARCH METHODOLOGY

3.1 Sample Selection

A sample of 143 international companies operating in sectors characterised by high or medium operational sensitivity to water[1] was selected from the list of ASSET4 global companies to investigate the characteristics of water-related information disclosed in relation to the UN SDGs in the period 2016–2020. This selection criterion has resulted in a total of 715 firm-year observations. We have chosen to focus on companies operating in sectors with high or medium operational sensitivity as these companies are expected to engage more heavily in water-related actions and, consequently, to disclose relevant information concerning such actions (Zeng et al., 2020; Zhang et al., 2021).

3.2 Extent and Quality of SDG Water-Related Disclosures

We examine both the quantity and quality of SDG water-related disclosures. To identify and prepare firms' SDG water-related disclosures for variable constructions, we first use textual analysis packages such as Quanteda and tokenizers to parse firms' sustainability texts into sentences. Next, we employ the SDG 6 and SDG 14 keyword lists developed by Wang et al. (2023) to identify water-related disclosures. We define a sentence as an SDG water-related disclosure if the sentence contains at least one of the keywords from our dictionary. Finally, we pool all identified sentences from each report to generate our main variables of interest.

3.2.1 Extent of water-related disclosures

We use two alternative measures to capture the extent of water-related disclosures. Our first variable (*WATER_DIS_NUM*) captures the absolute extent of water-related disclosures. It is defined as the number of sentences mentioning SDG 6 or SDG 14 keywords in a firm's sustainability report. Our second variable (*WATER_DIS_PERC*) captures the relative extent of water-related disclosures, which is defined as the percentage of water-related sentences over total sentences of disclosure in a sustainability report. To provide further insights into the specific information related to individual SDGs, we also split disclosures into SDG 6 and SDG 14 -related disclosures.

3.2.2 Disclosure tone

Disclosure tone is the presentation of content which can be used by businesses to manipulate users' beliefs and perceptions about corporate performance (Muslu et al., 2019). Firms that use an abnormally optimistic tone to disclose poor performance in sustainability reports are likely

to exaggerate their sustainability performance, hence resulting in lower disclosure quality. Alternatively, firms that use a pessimistic tone in the sustainability reports are likely to indicate a lower likelihood of opportunistic behaviour by management , thus indicating a higher disclosure quality (Muslu et al., 2019). Following prior studies, we employ the Loughran and McDonald (2011) list of "positive" and "negative" words to measure the tone or sentiment of corporate water disclosures (*TONE*). This list is widely used in accounting studies to measure the tone of both financial and non-financial disclosures (Loughran & McDonald, 2016; Muslu et al., 2019). We measure disclosure tone as the ratio of the difference between the number of positive (optimistic) and negative (pessimistic) words over the total number of words in the water-related disclosures, as identified in our first stage of analysis.

3.2.3 Disclosure readability

Similarly, firms may obfuscate their negative actions by making their qualitative disclosure less readable and hiding negative aspects of sustainability performance (Cho et al., 2012; Diouf & Boiral, 2017). Firms that use more readable sentences are less likely to hide or obfuscate negative activities and are more transparent in non-financial voluntary disclosure such as sustainability reporting (Li, 2008). Studies on syntactic manipulation use several methods such as FOG, SMOG (Simple Measure of Gobbledygook), and Flesch-Kinkaid to measure the readability of a text (Brennan et al., 2009). Although the FOG index is the most popular measure of readability, it is likely to be an inappropriate and poorly specified measure for measuring the readability of business documents as complex business terms can be easily understood by the investors (Brennan et al., 2009; Loughran & McDonald, 2014; 2016). Following Muslu et al. (2019), we use the SMOG index, which is more effective for assessing the readability of high-quality reports. The SMOG index is calculated as SMOG = 1.043 × [(number of polysyllables) × (30/number of sentences)]$^{1/2}$ + 3.129. A higher index indicates the length of formal education (number of years) required for a reader of average intelligence to understand the qualitative disclosure (i.e., lower readability).

3.2.4 Disclosure length

Last, firms may use more wording and lengthier texts to increase the complexity of disclosures (Li, 2008; Loughran & McDonald, 2014). Therefore, we also use the average length of water disclosure as another indicator of water disclosure quality. We define the average length of disclosures (*LENGTH*) as the average number of words in each relevant sentence (Leung et al., 2015). This measure is different from the extent of water disclosures as it captures the overall complexity of sentences reported.

4 MAIN FINDINGS AND DISCUSSIONS

4.1 SDG Water Disclosures by Country and Industry

In this section, we present descriptive statistics of the main measures used to evaluate the quantity and quality of water-related disclosures and show how firms are disclosing water-related information around the world.

Table 23.1 Panel A presents the sample distribution by country. As indicated in the table, most of the firms that report water-related disclosures come from Japan, followed by

Table 23.1 Composition of the sample

Panel A – Country-based segment of the sample					
Country name	No. of companies	Country name	No. of companies	Country name	No. of companies
Japan	69	Sweden	4	Austria	1
Germany	9	Switzerland	4	Greece	1
South Korea	9	Taiwan	3	Hong Kong	1
China	6	Thailand	3	Hungary	1
France	6	Belgium	2	Ireland	1
UK	5	Canada	2	Italy	1
USA	5	Netherlands	2	Luxemburg	1
Finland	4	Norway	2	Russia	1
Panel B – Industry-based segment of the sample					
Industry sector	No. of companies	Industry sector	No. of companies	Industry sector	No. of companies
Basic materials	43	Technologies	17	Energy	7
Industrials	22	Health care	14	Utilities	7
Consumer discretionary	20	Consumer Staples	13		

Germany, South Korea, China, France, the UK, and the US. By contrast, we found very few firms reporting water-related disclosures in countries including Austria, Greece, Hong Kong, Hungary, Ireland, Italy, Luxembourg, and Russia.

Table 23.1 Panel B presents our sample distribution as classified by eight major industry sectors based on the Industry Classification Benchmark. As shown in the table, most of the sample firms come from the basic materials industry (30%), industrials (15%) and consumer discretionary (14%). These results are consistent with the identification by the CEO Water Mandate (2014) where firms coming from high water-sensitive industries are more likely to report water-related information.

4.2 The Extent of SDG Water-Related Disclosures

Table 23.2 Panel A reports the descriptive statistics of the extent of water-related disclosures. As indicated in the table, there is a large variation in how firms disclose water-related information, ranging from 22 sentences in the lower quantile to 87 sentences in the upper quantile. The average number of sentences referring to water-related information is approximately 67 sentences. When converting them to percentages, firms on average allocate 4.6% of spaces discussing water-related issues, which is remarkably low given the potential water risk firms may face. This result is consistent with prior studies that find that firms, even though they are from high water risk industries, tend to disclose minimal SDG water-related information in their sustainability reports (Zeng et al., 2020). These findings seem to indicate that firms are acting slowly in response to the increasing demand from stakeholders for nature-related disclosures (Zeng et al., 2020; Zhang et al., 2021).

We further examine differences between the SDG topics that firms tend to focus on by splitting SDG water-related disclosures into SDG 6-related and SDG 14-related information. As shown in Table 23.2 Panel B, firms on average disclose 23 sentences on SDG 6 and 63

Table 23.2 Findings of the extent of water disclosures

Panel A. Descriptive statistics of the extent of water disclosures						
	N	Mean	SD	P25	P50	P75
WATER_DIS_NUM	715	67.33	75.88	22.00	45.00	85.00
WATER_DIS_PERC	715	4.60	5.05	1.85	3.39	5.27
Panel B. T-test between SDG6 and SDG14 disclosures						
	N	Mean	Std Error	SD	Diff	t stats
SDG6_ DIS_NUM	715	22.67	0.82	21.98	−40.8	
SDG14_ DIS_NUM	715	63.47	2.78	74.29		−17.05***
SDG6_DIS_PERC	715	1.60	0.06	1.72	−2.74	
SDG14_ DIS_PERC	715	4.34	0.19	4.95		−18.33***
Panel C. Trends of the average extent of water disclosures						
	Stats	2016	2017	2018	2019	2020
WATER_DIS_NUM	Mean	59.81	62.28	66.92	69.22	78.43
WATER_DIS_PERC	Mean	4.69	4.80	4.32	4.64	4.54

Note: *** $p < 0.01$.

sentences on SDG 14, which constitute 1.6% and 4.3% of total sentences disclosed in sustainability reports, respectively. A further T-test in Table 23.2 Panel B confirms that the extent of SDG 14 disclosures is significantly larger than that of SDG 6 disclosures. These results suggest that firms consider the environmental aspect of water resources, i.e., the conservation and sustainable use of oceans, seas and marine resources, to be more financially material than its social aspect, i.e. ensuring availability and sustainable management of water and sanitation for all. One possible explanation for this difference is that, given the increasing demand for nature-related financial disclosures from the market, firms that rely heavily on water resources are more likely to discuss the risks and opportunities of water use to meet investors' information needs. In contrast, clean water and sanitation would require more community contributions, hence the market may respond less favourably when firms over-invest in this area, consistent with the findings in Afrin et al. (2022).

We also investigate the trends of firms' SDG water-related reporting over the sample period. Table 23.2 Panel C shows that there is an upward trend for firms reporting SDG water-related information in their sustainability reports, with a jump from approximately 60 sentences in 2016 to more than 78 sentences in 2020. There are two possible drivers behind this trend. First, there is a strong market demand for firms to disclose natural capital information due to the increasing attention of investors to climate change and its associated environmental issues. With the growing population and the acceleration of global warming, it has been forecast that global demand for clean water will exceed the available supply by 40% by 2030 (CEO Water Mandate, 2008). Consequently, investors are calling for more water-related financial disclosures from firms that heavily rely on water resources. This demand is also reflected in the ongoing development of the Taskforce on Nature-Related Financial Disclosures (TNFD). Second, the wide adoption of/participation in the Global Reporting Initiatives (GRI), the EU Corporate Sustainability Reporting Directive (CSRD), the Sustainability Accounting Standards Board (SASB) Standards, and the Carbon Disclosure Project (CDP) also provide more guidelines on how firms should disclose water-related information. As a result, firms increase such disclosures to comply with these standards. Despite the number of sentences increasing over the sample period, we also find a downward trend for the proportion of water-related

Table 23.3 Findings of the textual characteristics of water disclosures

Panel A. Descriptive statistics of the textual characteristics of water disclosures						
	N	Mean	SD	P25	P50	P75
TONE	715	0.05	0.22	-0.07	0.05	0.19
SMOG	715	24.31	6.52	20.26	23.23	27.19
POS_SENTENCE	715	16.69	19.83	4.00	10.00	20.50
NEG_SENTENCE	715	11.74	12.00	4.00	8.00	16.00
LENGTH	715	163.64	106.01	108.62	136.18	186.38
Panel B. Trends of the textual characteristics of water disclosures						
	Stats	2016	2017	2018	2019	2020
TONE	Mean	0.08	0.06	0.05	0.06	0.03
SMOG	Mean	24.02	24.56	24.24	24.65	24.08
LENGTH	Mean	160.24	164.91	158.97	180.26	153.80

information in sustainability reports. For example, the percentage of water-related disclosures dropped from 4.8% in 2017 to 4.54% in 2020. This is probably due to the increasing amount of information being reported in the sustainability reports, reflecting the increasing market and regulatory pressures for sustainability transparency.

4.3 Tone, Readability, and the Average Length of SDG Water-Related Disclosures

Next, we examine the textual characteristics of SDG water-related disclosures by examining their tone, readability, and length. Table 23.3 Panel A reports the descriptive statistics of the tone, readability, and average number of words of water disclosures. The results show that firms tend to disclose SDG water disclosures in a more positive tone as the mean sentiment of sentences is 0.05, but the tone is close to neutral. However, the statistics also reveal a wide difference between tone in the lower quantile (−0.07) and the upper quantile (0.19). We further separate sentences into positive and negative ones and the results show that firms tend to highlight the positive aspects of their sustainability performance. These results are consistent with prior studies arguing that firms adopt impression management strategies to manage stakeholder perceptions about water performance (Diouf & Boiral, 2017).

To illustrate how tone varies in water-related disclosures, we present two text extracts of water disclosures found in our sample. The first text extract is found in the Evonik AG Sustainability Report 2017. The second text extract is disclosed in the AUO Corporation 2020 Sustainability Report. As we can see from the texts, Evonik AG highlights the increases in wastewater loads and provides further explanations for the reasons behind such increases in its water disclosures, suggesting the firm is presenting a neutral picture of its water performance. By contrast, AUO Corporation uses several impressive phrases, such as *continued to promote*, and *successfully decrease*, to highlight the positive side of its water performance without mentioning any negative aspects or potential challenges faced. Therefore, Extract 2 is considered to portray a more positive nature of the firm's water performance than Extract 1.

BOX 23.1 TEXTS WITH NEGATIVE AND POSITIVE SENTIMENT

Extract 1: Texts with Negative Sentiment

Chemical oxygen demand (COD) accounts for the highest proportion of wastewater loads. This is the concentration of all substances in the wastewater that can be oxidized under certain conditions. About half of the increase in COD is due to the initial consolidation of the businesses acquired from Air Products. In addition, there was an increase in wastewater loads in some cases due to higher production output. The slight rise in heavy metal emissions was essentially within the analytical variation for the measuring method because in many cases the values obtained are only slightly above the detection threshold.

Source: Evonik AG Sustainability Report 2017.

Extract 2: Texts with Positive Sentiment

AUO has continued to promote production water reduction, circulating water reuse, and increasing the recycling of production water, we have successfully decreased production water in 2020 by 1.19 million tonnes. In terms of production water recycling, AUO has recycled 158.46 million m^3 of water in 2020, an increase of 13.05 million m^3 from 2019. Production recycles rate also rose from 92.29% to 93.81%. In terms of water use intensity, due to the lowering of water consumption, a total of 21.69 million m^3 of water was used in 2020, and water consumption per unit was decreased from 0.35 tonne/m^2 to 0.32 tonne/m^2.

Source: AUO Corporation Sustainability Report 2020.

Next, we examine whether firms manage impressions by making SDG water-related information more difficult to understand. The results show that the average value of the SMOG index is 24.31, which indicates that people would need a graduate education level to read and understand the texts. This finding suggests that managers obfuscate water disclosures by using more complicated and less readable sentences, consistent with the impression management literature (Brennan et al., 2009; Muslu et al., 2019). To demonstrate how the readability varies among reports, we present two text extracts with high and low SMOG indexes. The first one is disclosed in Indorama Ventures Sustainability Report 2017 with a SMOG index of 18.77. The second text extract is found in the Huntsman International Sustainability Report 2017, with a SMOG index of 12.16. As we can see from the texts, Extract 1 has lengthy sentences with excessive use of commas. The text also uses more complicated words to explain water-related actions. By contrast, Extract 2 uses relatively shorter sentences and limited use of commas; the text is also well structured by using ordinal adverbs. Consequently, Extract 2 is easier to read and more understandable than Extract 1.

BOX 23.2 TEXTS WITH HIGH AND LOW SMOG

Extract 1: Texts with High SMOG

IVL Dhunseri Petrochem Industries Private Limited, an IVL subsidiary in Panipat, Haryana, India, established a rainwater harvesting system at its plant in 2017 to supply surface water

to subsurface aquifers (before it's lost as surface runoff). The amount of rainwater estimated to percolate into the ground is over 41,500 m^3/year, which amounts to approximately over 30% of 2017 annual fresh water withdrawn by the plant. This water will be free of pollutants as well as salts, minerals and other man made contaminants, and will help in reducing soil erosion and contamination of surface water with pesticides and fertilizers by replenishing groundwater. We have plans to extend this system to additional sites in future.

Source: Indorama Ventures Sustainability Report 2017.

Extract 2: Texts with Low SMOG

Huntsman's discharges to water have decreased since 2010 through 2015, remained nearly flat in 2016, and decreased again in 2017. There are two reasons for this trend. First, we are complying with – and in many cases exceeding – increasingly strict water quality standards. Second, we understand water quality's direct connection with water scarcity. Keeping water clean goes hand in hand with the efficient use of water. Huntsman's improvements on water quality strengthen the company's commitment to conserving water.

Source: Huntsman International Sustainability Report 2017.

Furthermore, we examine whether firms use lengthier sentences to increase the complexities of disclosures. As we can see from Table 23.3, the average number of words in a sentence is 163 which is significantly higher than the average words per sentence (approximately 23 words) in a 10-K report (Loughran & McDonald, 2014). This finding is consistent with prior studies showing that managers would use lengthier sentences to confuse users of the information. We also present two text extracts with shorter and lengthier sentences to show how managers may adopt this technique to conceal certain information. The first text is extracted from the Agfa-Gevaert Annual Report 2019 while the second one is found in the LG Household CSR Report 2018. In terms of the average number of words in a sentence, Extract 1 has, on average, 13.86 words per sentence, while Extract 2 has 22.25. Although Extract 1 has relatively more words in total (i.e., 97) compared to Extract 2 (i.e., 89), it uses fewer words per sentence to report water performance. Extract 2, by contrast, uses more words per sentence, which makes information rather disjointed and difficult to understand. Overall, these two examples demonstrate how lengthy sentences can be used to confuse readers about firms' water-related activities.

BOX 23.3 TEXTS WITH LENGTHY AND SHORT SENTENCES

Extract 1: Texts with Short Sentences

Total water consumption decreased by 8.6% in 2019. Specific water consumption rose slightly by 2.1% to 31.3 m^3 per tonne of product produced. Water consumption excluding cooling water fell by 18.3% in 2019. Specific water consumption excluding cooling water fell by 8.7% to 10.6 m^3 per tonne of product produced. This is the result of continued efforts to use water sparingly. The specific process water consumption could once again be further reduced to 4.5 m^3 per tonne of product produced. The continuous efforts we are making to optimize the production processes therefore result in a considerable reduction.

Source: Agfa-Gevaert Annual Report 2019

Extract 2: Texts with Lengthy Sentences

In 2018, our overall water consumption decreased from the previous year. The consumption of surface water and water supply increased by 3.7% and 3.9%, respectively, while that of groundwater decreased by 20.5%. This was because HAITAI htb switched its water source for CIP1) at its business site in Cheonan from groundwater to water supply. To reduce water consumption, our business sites continue to manage the amount of water use for each purpose, find appropriate usage of recycled water, and develop improvement measures for areas that require high water consumption.

Source: LG Household CSR Report 2018

Lastly, we examine the trends of water disclosure textual characteristics over the sample period. Table 23.3 Panel B reports the mean values of tone, readability, and average length between 2016 and 2020. We find a downward trend for the tone of water-related disclosures, suggesting that firms have started discussing negative aspects of water performance, largely due to the increasing demand for water risk information. Regarding readability and the average length, we, however, do not observe a clear trend over the sample period. The readability of water disclosures is largely consistent while the average length has fluctuated over the years. Such fluctuation may be caused by changes in the writing/formatting style of the sustainability reports.

5 CONCLUSIONS

In this chapter, we investigate how companies disclose their commitment to the achievement of water-related SDGs in terms of the quantity and quality (tone, readability and length) of the related narrative disclosures. By analysing water-related SDGs disclosures reported by 143 international companies in the period 2016–2020, our results highlight two major concerns in relation to firms' SDG reporting practices. First, they reveal a low engagement in reporting SDG water-related information and an over-emphasis on reporting information related to water risk (SDG 14) with limited information regarding improving water hygiene and providing clean water to less developed economies (SDG 6), which may impede the achievement of SDG goals by 2030. While this chapter does not examine the possible causes behind this phenomenon, we speculate that the market and regulatory demands for more water transparency may be one of the factors driving the provision of more information related to SDG 14 than SDG 6. We believe that it is important for firms to report information in relation to both SDGs since the two goals are interconnected and it is against the ethos of the UN SDG framework to advance one goal while downplaying the others (Bebbington & Unerman, 2018; Nilsson et al., 2016). Second, our results also reveal that disclosures on water-related SDGs are biased, as firms tend to highlight more positive aspects of their water-related performance, and use texts that are more complex and difficult to understand. In fact, these findings are not new, as extensive studies have shown that firms employ impression management strategies when reporting sustainability-related information (Brennan et al., 2009; Muslu et al., 2019). However, our results suggest that there is a downward trend for using an optimistic tone in SDG water-related disclosures, suggesting that it may be increasingly difficult for firms to engage in impression management strategies when stakeholders are increasingly concerned

with environmental issues. Furthermore, the implementation and adoption of stringent sustainability reporting standards, such as European Sustainability Reporting Standards (ESRS), SASB, GRI, and ISSB standards, may also force firms to report metrics of their (positive and negative) water performance. Future studies could certainly explore the impact of sustainability reporting standards on the quality of SDG disclosures as well as its role in mitigating the use of impression management strategies when reporting.

While this chapter only provides an overview of how firms report SDG water-related information, future studies could also explore the impact of SDG water reporting beyond the capital market. For example, while it is important for firms to assess and report risks related to water scarcity, it is equally important to understand the impact of firms' operations on local water sources and the impact of water use on sanitation and water accessibility in water-scarce regions. This research question is in line with the notion of double materiality adopted by the EU Corporate Sustainability Reporting Directive (CSRD), according to which firms should account for both inward and outward sustainability impacts. Scholars could explore these research questions using interdisciplinary theories and perspectives, and some recent examples including Gaia theory (Rodrigue & Romi, 2022), planetary boundaries (Rockström et al., 2009), and an Anthropocene perspective (Bebbington et al., 2020). A greater understanding of these questions could also be achieved by introducing novel environmental science datasets to accounting research. Although the SDGs are largely set at the country level, accounting scholars also play a major role in converting these national indicators into firm-level metrics. Therefore, we believe that there are ample research opportunities that could potentially be exploited during this conversion and accounting process. At the same time, we should also be aware that the clock is ticking and there is not much time left for us to meet these goals by 2030.

NOTE

1. The following industries are considered as industries with high priority for exposing significant water-related business risks: agriculture, beverage producers, biomass power production, chemicals, clothing and apparel, electric power production, food producers, food retailers, forestry and paper, freshwater fishing and aquaculture, hydropower production, mining, oil and gas, pharmaceuticals and biotech, technology hardware and equipment, semiconductors, water utilities, and services sectors. However, construction and materials, gas distribution and multi-utilities, manufacturing of industrial goods, household goods, home construction, leisure goods, media (printed), real estate (asset owners), transportation and travel, and leisure sectors are listed as the medium priority (CEO Water Mandate, 2014).

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