The Shape of Water: Analysis of Corporate Water Disclosure in Indonesia

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Abstract

Indonesia is facing a water crisis in terms of the scarcity and quality of its water resources. Considering this water-constrained future, it is important that several parties, including companies in Indonesia as one of the significant actors, pay attention to the pristine management and reporting of this scarce resource. This study evaluates the reporting and disclosure requirements of water of Indonesian listed companies in 2014 - 2016. Content analysis was used as the research method to analyse the water disclosure and to evaluate the adequacy of the disclosure against the global disclosure requirement from the Global Reporting Initiative (GRI) G4. The findings of the study show that most of the companies have illustrated the commitment toward water stewardship by reporting on water-related aspects. However, when compared to the global standard, the level of disclosure is still low, which might reflect the lack of demand from stakeholders or the low necessity to seek legitimacy from water reporting. This also implies future opportunities for companies to better perform water management and present a more complete water disclosure for stakeholders. [2]

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1. Introduction

Water resources of Indonesia represent almost six percent of the world's water or 21 percent of the Asia-Pacific region's; however, the country is now facing water crisis in terms of water scarcity and access to clean water for its people (Rakhmat, 2018). Several sources for the degradation of hydrological conditions can be attributed to domestic wastes, agricultural and mining increasing needs, deforestation, the impact of climate change, as well as industrial activities (Association of Indonesian Water Supply Companies, 2016).

Globally, water issues in Indonesia are not different from other countries; the problems are revolving around scarcity, water quality and water management. Poor water management will not only affect human health and the eco-system; but can also result in business disruption (Burritt, Christ, and Omori, 2016). In Indonesia, environment and development issues are relatively more complex and are shaped by governance processes at different scales. For example, water problem is worsened due to the increasing population that also bring about increasing water demand (as per 2020, Indonesia was ranked 4th in the list of countries with the largest population (Worldometers, 2020). Another problem is related to the low level of education possessed by most of the people who bring challenges in delivering public awareness to improve water conservation.

Corporations are one of the high impact users of water resources due to industrial activities especially in the sector of agriculture, mining, and other manufacturing sectors. The initiatives for business and in business regarding water issues are increasing due to concerns over increasing uncertainty surrounding water supplies and competing demands for water. Besides the demand side of water, corporations also act in the supply side by viewing the water crisis as a big opportunity for water business. The lack of clean drinking water makes residents mostly dependent on bottled water produced by various brands, creating the commercialization of water. A large population makes drinking water businesses in Indonesia very tempting as consumption increases 11-12 percent per year (Rakhmat, 2018).

The contributions from corporate sectors to water problems generate questions on how they contribute to the solutions. From a sustainability accounting point of view, this engenders the accountability from corporations in the form of water disclosure toward transparent and accountable reporting. Some previous studies on the Indonesian context show that the water issue has been widely analysed as part of the corporate social responsibility or sustainability theme (see, for example, Gunawan (2016); Siregar & Bachtiar (2010)). None of the previous studies, published in reputable journals, have addressed the water disclosure in Indonesia in a specific sense from the accountability perspective.

Given the increasing awareness of water crisis in Indonesia and the important role to be played by corporations to contribute to the solutions, the lack of previous studies focusing on corporate water disclosure in Indonesia has created a research gap to be fulfilled by this study. The water constraint provides evidence that companies in Indonesia should pay attention to the genuine management and reporting of this scarce resource. Given the potential role that can be played by the corporate sector, at present, our study shows that the challenge is how to improve the accounting and accountability of water resources and water consumption given the lack of available data on which companies can base their business decisions about water scarcity, water surpluses and water management opportunities.

The research question of "What is the level of adequacy of Indonesian companies' water disclosure against global disclosure requirements of the Global Reporting Initiative (GRI) G4?" is the main question tried to be answered by this study, with the aim to present the current corporate water disclosure in Indonesia. Research in this area can have important academic as well as

practical contributions. From the academic perspective, this research can fulfil the research gap on the efforts performed by Indonesian companies in water management and reporting compared to the global standard. This research can contribute to the knowledge of the role played by corporations in supporting ecological sustainability, especially in terms of water conservation, in a context of a developing country facing various environmental problems. As for practical contributions, the findings from this study can inform related stakeholders, including government, accounting standard setters, and environmental activists' groups, on the design of related policies and actions to enhance the involvement of business party to solve water problems in Indonesia.

The next section will present the literature review, followed by the research method taken in this study. Results and analysis of the findings are presented next, and the paper concludes with the discussion and conclusion together with the identified research limitations and implications.

2. Literature Review

2.1 Corporate water accountability

Business activities affect and are affected by societal issues linked to water use (Porter & Kramer, 2011); and hence, provide one rationale for corporate water responsibility beyond short-term economic gains (Martinez, 2015). Company operations are often water intensive, especially in certain industries and may bring about various types of polluters in water. Some companies have tried enhancing water resource efficiency on the basis of water footprint analysis to reduce water use intensity (DEFRA, 2011). Besides the efficiency, equitable access to clean water also has to be insured so that society can have access to food security, basic sanitation, and ecological integrity. From this perspective, the ultimate goal of corporate water responsibility is that "companies contribute to ecological integrity via the efficient and equitable abstraction, usage, and disposal of water resources" (Martinez, 2015, pp. 141).

In Indonesia, corporate responsibility for water resources has been accommodated in general in the adoption of the 2007 Indonesian Law No. 40 regarding Corporate Social Responsibility (CSR). It serves to enforce the implementation of CSR in Indonesia and may act as a preventive tool to keep corporations from irresponsible behaviour toward social and environment (Waagstein, 2011).

Several theories are relevant to explain corporate water responsibility, including stakeholder theory and legitimacy theory. Stakeholder theory expresses the importance of support and approval from stakeholders on an organisation's continued existence (Liu & Anbumozhi, 2009). This means that corporations need to attend to various stakeholders' interests, not only the shareholders' through stakeholder engagement program. The lack of stakeholder engagement is predicted to result in low levels of environmental activities and hence, low disclosure in this area.

2.2 Previous research on water disclosure

Previous research on water disclosure presented in this section is grouped into three main categories. First, previous research investigating the level of disclosure using certain predetermined criteria. Second, the research analysing the antecedents or drivers, or determinants, of water disclosure is presented. Third, research focusing on the consequences of water disclosure is discussed.

For the first category of previous research, Botha and Middelberg (2016) can be included here for their investigation on the adequacy of water-related reporting and disclosure by companies in South Africa. The samples contain the of Socially Responsible Investment-indexed (SRI-indexed) JSE (Johannesburg Stock Exchange)-listed companies. Content analysis was used to analyse the integrated reports of the high-impact users based on the disclosure requirements of integrated reporting, King III, the Global Reporting Initiative (GRI) and the Association of Chartered Certified Accountants (ACCA) as the benchmark. The findings show that most of the companies have presented commitment toward water stewardship through reporting. It is suggested that a more comprehensive and standardised set of guidelines on water disclosure per sector could add value to the reporting practices. A contradictory result is indicated in the research by Dennis, Connole, and Kraut (2015) for mining companies as a specific set of samples, where the lack of completeness of water disclosure is found.

The content analysis seems to be a widely used method to investigate the corporate water disclosure. Cantele, Tsalis, and Nikolaou (2018) develop an assessment framework based on a scoring technique presented an empirical analysis on the sustainability reports of Italian water utilities. The results show a low level of disclosure on the sustainability indicators suggested by the main sustainability reporting guidelines (Global Reporting Initiative, (GRI) and Sustainability Accounting Standard Board (SASB). It was also found that most companies tend to disclose information in a qualitative fashion only and fail to disclose some material aspects of water management, such as water recycled, network resilience, water sources, and effluent quality. They conclude by providing the implications that sustainability reporting is mainly considered a communication tool, instead of as a performance measurement and an accountability tool. Similar findings are also confirmed by Talbot and Barbat (2020) in their research evaluating the credibility of water disclosure in the mining sector. Employing a qualitative content analysis, they found that mining companies disclose information not consistent with the GRI guidelines and some impression management techniques were used to justify negative information regarding water performance.

Kleinman, Kuei, and Lee (2017) employ formal concept analysis (FCA) to analyse water disclosure of selected companies in the US food and beverage industry that have followed the water guidelines set forth by the Global Reporting Initiative (GRI) and CEO Water Mandate. It was found that assessments of water consumption and water withdrawal were cited more often, as well as sustainable water management goals and water quality strategy.

The second stream of research discusses the drivers of corporate water disclosure. Burritt et al. (2016) investigated this issue in Japan through the lens of managerial stakeholder theory. It was found that the size, water sensitivity, and ownership concentration were the significant determinants of water-related disclosure of the sample companies. Greater media exposure was surprisingly associated with less water-related disclosure. Debt ratio, blockholders' ownership ratio, inclusion in a capital market index (i.e., S&P500), and inclusion in a water-sensitive industry are other determinants of corporate water disclosure found by Yu, Kuo, and Ma (2020).

How information disclosure influences firms' and stakeholders' behaviour was investigated in the third stream of research. Bennear and Olmstead (2008) investigated this issue by utilizing the political mechanism as the way in which information disclosure

influences the behaviour of regulated firms, in this case, the community drinking water suppliers. The results suggest that mandatory information provision on drinking water violations reduced total violations by between 30% and 44% and reduced the more severe health violations by 40%–57%. Zhou et al. (2018) examine the impact of water disclosure on corporate risk-taking and the moderating effect of organizational legitimacy using the samples of 334 listed companies in Chinese high water-risk industries from 2010 to 2015. The results show that water disclosure is negatively associated with corporate risk-taking, and organizational legitimacy plays a significant moderating role in the association. This implies that water disclosure will cause more effective water management to support the continued development of enterprises and the entire social economy. Another benefit of water disclosure was found by Liu, Su, and Zhang (2021) stating that water information disclosure promotes financial reporting quality based on an empirical study of listed companies in China.

Having presented the previous research categorised in three streams, it should be noted that the objective of this study is more closely related to the first stream, which is to investigate the level of water disclosure in Indonesian companies. This focus is chosen given scant research in this area for Indonesia context; and hence the first stage of research is better focusing on the level of disclosure first, with the expectation that it will generate other future studies investigating other water-related issues.

3. Research Method

This study uses content analysis to investigate the level of water disclosure of all Indonesian companies listed in the Indonesia Stock Exchange in 2014–2016. Content analysis is a common technique used to analyse economic, social and environmental information in business and accounting studies, (Krippendorff, 2019). This method is used to gather and analyse the content of text which can be in the form of words, meanings, pictures, symbols, ideas, themes, or any type of communication (Neuman, 2014). The text is coded, manually or computer-aided, into various categories or concepts following certain criteria. The content analysis method is chosen over other methods as this research aimed at understanding the level of water disclosure -as a form of text- of Indonesian companies against GRI criteria. GRI reporting framework was selected as the disclosure criteria as it is the most widely used non-financial reporting framework in the worldwide, including in Indonesia. GRI has played a significant role in the long journey of sustainability reporting guidelines led by GRI in 1997. The guidelines have been revised over time and generally uses a specific name or code GRI G2 was published in 2002; and then GRI G3, GRI G3.1, GRI G4 were launched sequentially in 2006, 2011, and 2013 (Global Reporting Initiative, 2020).

In 2015, GRI formed the Global Sustainability Standards Board (GRI GSSB) which was specifically tasked with handling the development of sustainability reporting standards. Toward the fourth quarter of 2016, the GRI GSSB began introducing the GRI Standards, which were then launched in Indonesia in 2017. The GRI Standards is effective for reports or other materials published on or after 1 January 2021; however, earlier adoption is encouraged. Due to the transition to the new standard which might cause the criteria for content analysis not uniform among sample companies, we decided to take the research period of 2014-2016 where GRI G4 was used as the guideline for most companies in Indonesia. Another consideration is that both GRI G4 and GRI Standards share the same emphasis and principles, including in the aspect of water reporting.

The sample companies are listed in nine sectors namely the consumer goods; finance; infrastructure, utilities and transportation; mining; property and real estate; trade services and investment; agriculture; basic industries and chemicals; and miscellaneous sector. The information is gathered from the sustainability report and annual report in 2014-2016 to describe the disclosure practices based on GRI G4. The content analysis is performed in three stages as follows.

1. The first step involves the identification of what companies say about water in their reports. The disclosure theme emerged from this stage is presented.
2. The second step involves the assessment of water disclosure based on the Global Reporting Initiative as the most widely used guidelines on environmental issues. The scoring system has 3 values to be assigned on each type of disclosure: 0 if not disclosed, 1 if disclosed qualitatively and 2 if disclosed quantitatively.
3. The last step is the comparison of results gained from stage 1 and 2.

4. Results and Analysis

Year 2016 was used as the basis to determine the sample. There were 463 listed companies investigated in this study, but not all of them disclosed water-related issues. The data can be found in Table 1, where 40% of companies disclosed water-related issues in 2016 compared to 56% that did not. In the three-year period (2014-2016), not all companies published Sustainability Report every year; some of them published the report every two-year. In the latter case, the company was still included as a sample.

Table 1 Companies per Sector as per December 31, 2016

No.	Sector	Disclosing companies	Non-disclosing companies	Reports not available	Total
1.	Consumer goods	21	13	3	37
2.	Finance	20	61	2	83
3.	Infrastructure, utilities and transportation	13	31	4	48
4.	Mining	9	2	3	14
5.	Property and real estate	19	23	0	42
6.	Trade services and investment	23	84	5	112
7.	Agriculture	15	5	1	21
8.	Basic industries and chemicals	33	31	1	65
9.	Miscellaneous	17	23	1	41
	TOTAL	170	273	20	463
	Percentage	**37%**	**59%**	**4%**	**100%**

The first step of the analysis is identifying what companies say about water issues in their 2016 reports. The focus on 2016 reflects the latest disclosure based on GRI G4 before the transition to the GRI Standards. After reading the disclosure presented by companies, several themes emerged as described in Table 2.

Table 2. Corporate water disclosure in 2016

No.	Themes	Example of disclosure (excerpts taken from 2016 Sustainability Report)
1.	Statement of company's policies regarding the use of water.	"As such, the Bank has implemented water and electricity saving policies in its all working units in Indonesia. These energy consumptions should have positive environmental impact considering BCA's wide business network."
2.	Cooperation with the local water utility company (PDAM—Perusahaan Daerah Air Minum).	"Cooperation with Pontianak Water Utilities (PDAM) "Pontianak Branch signed a cooperation with PDAM Tirta Khatulistiwa of Pontianak on online payment of water utility bill at the hall of PDAM Tirta Khatulistiwa."
3.	Activities for water conservation	"The Danamon Care for The Environment activity is oriented to the environmental health improvement of the people's market where Danamon/Adira branch/ unit operates, not limited to the assisted market. In its implementation, reforestation, making biopore holes, provision of clean water, improvement of public facilities in the market, and the procurement of sanitation facilities and infrastructures are the activities included."
		"Bank Mandiri is committed to avoid using ground water (deep well) since 2013, based on the consideration and concern that over utilization of ground water will have the degradation effects in the quantity as well as the quality of groundwater, which can affect the sustainability of surrounding environment. Based on the above consideration, Bank Mandiri has launched a movement called "save water" campaign for toilet use, mosque, canteen, garden, air conditioning machine, and other activities. This movement constitutes Bank Mandiri's commitment in preserving the environment in a sustainable manner and in raising awareness of all Mandirians in line with the effort to efficiently use water wisely and as needed."
4.	Education on water management	"BFI also supports HFH Indonesia in Kalialang Baru to facilitate training on Water Supply Management and Clean and Healthy Behaviour, hygiene and environmental health, as well as PDAM clean water channel construction and Early Childhood Development (ECD) facilities."
		"Love for the Trees Program A program targeting students (Kindergarten, Primary Schools, Junior Secondary Schools), women groups, and other surrounding communities."
5.	Statement of the impact of business operations	"As a financial services company, the environmental impacts from the BFI operational activity are relatively low compared to the likes of other industries. Due to the Company's nature and scale, the environmental impact is limited to the natural resources usage such as water, paper, and

No.	Themes	Example of disclosure (excerpts taken from 2016 Sustainability Report)
	on water resources	energy in the offices along with petrol usage and emissions from on-field activities."
6.	Participation in providing access to clean water	"Development of the facilities and infrastructures of clean water in Central Lombok (A State-Owned Enterprise Program "Present to The State")."
		"The first step in revitalizing the land was to build irrigation facilities, such as two groundwater wells for water source, and three water tanks that consist of two units with a capacity of 2,000 litres and one tank with a capacity of 5,000 litres. In order to distribute the water to the whole area, a water pipeline with 28 holes and removable sprinkle taps was also built."
7.	Statement of no impact on water resources	"Water Usage Water is not a significantly factor in our operations, and thus Indosat Ooredoo does not calculate or track total water withdrawal by source, nor does it recycle and reuse water in large quantities. No water sources were significantly affected by Indosat Ooredoo's operations in 2016."
8.	Detail information of water utilization	Pemakaian Air 2012 – 2016 Water Utilization 2012 – 2016 Tahun / Year | Pemakaian Air (m3) / Water Utilization 2012 | 315.217 2013 | 226.250 2014 | 99.745 2015 | 88.078 2016 | 64.761
9.	Water quality management	"Water quality management is conducted to meet water quality standards as stipulated in the Environmental Impact Assessment (AMDAL) document, Decision of Environment Minister No. 113/2003, and Regional Regulation of East Kalimantan 02/2011. Activities of water quality management include management of sediment, mine acid water, mine effluents for washing, and regular monitoring."
10.	Statement of compliance to regulations	"Compliance with various government regulations that related to SHE is the priority of the Company that must be implemented, including the wastewater management regulations, the management of air emissions, B3 waste management, the implementation of all the provisions in the environmental permits such as EIA and UKL-UPL, as well as the management of hygiene and sanitary work environment. Therefore, the Company ensures that environmental management conducted is carried out in accordance with the applicable provisions."

No.	Themes	Example of disclosure (excerpts taken from 2016 Sustainability Report)
11.	Achievement in water conservation	"Green PROPER category is awarded to companies that have managed their environments beyond the requirements by performing biodiversity conservation, environmental management system, 3R (Reduce, Reuse, Recycle) concept for solid and B3 wastes, water conservation, emissions reduction and energy efficiency. The award is an appreciation for Sido Muncul's efforts to innovate in natural resources management and the surrounding community empowerment as an embodiment of the Company's care for environmental sustainability and well-being of its surrounding community."
12.	Waste water management	"In general, there are several waste water management procedures in the Company, as follows: i. Non-hazardous liquid waste and others hazardous liquid waste are processed in the Company's water waste management unit, whereby the results are monitored in cooperation with Bogor Agriculture Institute on a monthly basis. ii. Hazardous waste, processed by a waste destruction company with official license and registered to demolish waste approved by the Republic of Indonesia government. iii. Other non-hazardous dry waste is disposed to non-hazardous waste disposal site owned by the government."
13.	Statement of water risk	"The Company might be subject to significant environmental costs. The Company's mining operations involve the use of water, overburden disposal, runoff construction, stockpiling of coal, soil deposit, as well as emission discharge, may lead to negative impacts on the environment."

From the disclosure theme identified in the sample, it is evident that companies have disclosed the water-related aspect, especially on the policies, conservation, and risk. Most of the disclosure is in qualitative nature, except for the detail information on water utilization.

The next step is to score the corporate water disclosure against the guidelines provided by the Global Reporting Initiative (GRI) G4. The main water-related disclosure themes based on the GRI G4 are as follows.

1. Total water withdrawal by source
2. Water sources significantly affected by withdrawal of water
3. Percentage and total volume of water recycled and reused
4. Total water discharge by quality and destination
5. Total number and volume of significant spills
6. Identity, size, protected status, and biodiversity value of water bodies and related habitats significantly affected by the organization's discharges of water and runoff.

There is a total of 26 items of disclosure. Each item disclosed by companies is assigned a score of 0 (if not disclosed), 1 (disclosed qualitatively) and 2 (disclosed quantitatively). Total applicable items are then calculated by deducting items not applicable to certain companies (for instance the occurrence of spills). The score is calculated as follows:

$$\text{Water disclosure score (WDS)} = \frac{\text{the score of items disclosed}}{\text{total applicable items x 2}}$$

For 2016, the results show that only 74 companies that have scores, out of the total of 170 disclosing companies (43.5%). A maximum score of the 31 companies is 0.19, a minimum of 0.05 and 0.05 standard deviation. This means that per 2016, only a maximum of 19% of the applicable disclosure required by GRI 4 has been disclosed by companies in Indonesia. The highest score per main disclosure category is on the disclosure of total water withdrawal by source and percentage and the total volume of water recycled and reused. The majority of the disclosed items are in qualitative nature, which was also found by Cantele et al. (2018) for Italian context.

The detail of the disclosure pattern against the GRI G4 guidelines for the research period 2014-2016 is depicted in Table 3. Agriculture industry consistently had the highest average disclosure in 2014-2015 before being replaced by consumer goods in 2016. However, the maximum score was achieved by companies in the basic and chemical sector (cement and paper companies) in 2014-2015 and finance (banking) in 2016. Mining sector had the most number of companies that provide water-related disclosure, which might be attributed to the importance of water management in the mining activities. Contrasting data were shown by the agriculture industry, which had the least number of disclosing companies; but those that disclose provided relatively more information compared to other industries. Some sectors (consumer goods, finance, property and real estate, trade and services, and miscellaneous) showed an improvement in the average score of disclosure from 2014 to 2016.

There were two companies (in mining and property and real estate sector) reported significant spills in 2014. The disclosures were mainly qualitative information containing the locations and materials of spill (oil and fuel) reported in the Sustainability Report, but none of the companies reported the quantitative information in terms of the total number and volume of the spills as suggested by the GRI G4.

Table 3. Corporate water disclosure 2014-2016

Sector/Industry	**The average score of disclosure**			**Number of companies provided water disclosure**		
	2014	**2015**	**2016**	**2014**	**2015**	**2016**
Agriculture	0,221	0,167	0,057	4	5	8
Basic and chemical	0,164	0,156	0,056	8	11	6
Consumer goods	0,039	0,081	0,191	3	5	2
Finance	0,068	0,077	0,143	5	5	5
Infrastructure, Utilities, and Transportation	0,131	0,109	0,048	4	7	5
Mining	0,105	0,122	0,099	16	19	14
Property and Real Estate	0,063	0,083	0,095	12	8	9
Trade and Services	0,035	0,036	0,071	13	20	15
Miscellaneous	0,037	0,041	0,071	9	11	10
			Total	**74**	**91**	**74**
Overall: Average	0,087	0,091	0,045			

Maximum	0,5	0,476	0,238			
Minimum	0,024	0,024	0,024			
Standard Deviation	0,099	0,107	0,063			

Comparing the results of steps 1 and 2, it can be concluded that several companies in Indonesia (for example, in 2016 almost 44% of companies) have shown a commitment toward water management and reporting. Nevertheless, when compared to the global disclosure guideline, the score is still low and hence, there is still a huge room for companies to improve the quality of water disclosure.

5. Discussion and Conclusion

This research attempts to map the corporate water disclosure in Indonesia. As can be seen from the results, when compared to global guidelines of water disclosure, GRI G4, the level of disclosure is still relatively low. Conversely, several themes related to water have been disclosed voluntarily by Indonesian companies and hence it might be useful to develop a water reporting model or framework informed by an earlier work on water disclosure, stakeholders' need on the material water-related information as well as the existing guidance from the International Integrated Reporting Council (IIRC) and the Global Reporting Initiative (GRI) regarding the integrated and sustainability reporting (Büchling and Maroun, 2021; Isaksson and Steimle, 2009). The resulting framework can enable the production of a more detailed and effective water reporting then would be the case if only existing reporting models are used.

The deficiency of water information disclosure is not a unique finding of this study only as the phenomenon was also found in previous studies, for example in Liu et al. (2021) for Chinese enterprises, Talbot and Barbat (2020) for mining sector, and Yu et al. (2019) for US companies. The low level of disclosure compared to the global standard might reflect the lack of transparency due to the low demand of information from stakeholders or a low level of importance from companies to acquire or maintain legitimacy from water reporting. Further research is needed in this area to confirm the reasons behind the deficient water disclosure score. Moreover, it is also important to identify the legitimization or impression management strategies used by corporations in Indonesia and other emerging economies to influence stakeholders' perceptions. On the other hand, the question such as "accountability to and for whom?" (Russell, Milne, and Dey, 2017) might be relevant to ask here to appropriately identify the need of water reporting by stakeholders in a developing country context. While the global guidelines can provide guidance on the minimum items to disclose, the identification of water information that needs to be supplied by business sectors in a specific country might help to accommodate the local wisdom on water management and conservation.

The results of this study can become the basis to enhance the importance of water management and reporting to improve water accountability. Results from this study bring several implications for practitioners, policy makers and academics in the Indonesia context. Practitioners can take the step to become the leader in better water management and water-related disclosure practices in Indonesia. Policy makers in Indonesia, such as professional accountancy and government bodies, can encourage practitioners and accountants in companies to enhance their water-related disclosure by providing guidelines and incentives, as well as organising relevant training. The findings from this research can also serve for future research to discover more on the reasons behind the low level of disclosure, as well as to study the determinants and consequences of water disclosure. The focus on disclosure governance is not intended to make water reporting

as the end of the corporate sustainability journey; but instead, as a factor to support better water management as in many cases, business sector adopt the slogan "what is (not) measured, is (not) managed" (Gibassier, 2018).

This study is an exploratory research contains several limitations. First, the period of analysis is only 3 years, i.e., 2014-2016 to capture water disclosure against GRI G4. This approach is limited in capturing the trend of water disclosure from time to time. Future research can explore the trend for 5 or 10 year-periods. Second, the setting is limited to one country, namely, Indonesia. Amid the growing awareness of water scarcity, it would be useful to know the level of water disclosure in a region, such as in Asia or Southeast Asia: or to make a comparison with the developed economy such as Japan and Australia.

This research has been focusing on water reporting, which is one part of water accountability. Future research can explore the application of water accounting as an environmental management accounting tool to provide support for management decision making regarding the availability and efficient use of water (Christ and Burritt, 2017). Future research can also investigate how water accounting and accountability are used to reduce business-related water risks as identified by the World Business Council for Sustainable Development (WBCSD-SIUCN, 2012) as well as to enhance stakeholders' awareness of the risks related to water scarcity.

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