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WATER ACCOUNTING ACCOUNTABILITY IN INDONESIA MINNING INTENSIVE AREAS: AN EXPLORATION

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ABSTRACT
The focus of this paper is water accountability and accounting by mining companies in mining intensive areas of Indonesia, i.e. Sumatra, Bali, Kupang and Java. The areas studied exclude Kalimantan as the region has numerous groundwater deposits while the urgency of this study is related to water deposits. The disclosure practices of the mining companies in the areas in regard to water accountability along with further evaluations on the areas of water accounting in companies that consistently disclose their water accounting online offer initial insights on water accountability and accounting practices in Indonesia. These insights serve as motivations for mining companies in Indonesia to practice regular water accounting online and better accountability for preventing further water poverty in the areas, an aspect that Indonesia focuses in delivering Sustainable Development Goals (SDGs).

INTRODUCTION
This paper explores water accountability and accounting of mining companies in Indonesia's mining intensive areas with decreasing deposits of water. The urgency to study the topic on mining companies is due to the decreasing water deposits in Indonesia and the target of SDGs on improved access to drinking water as a part of poverty alleviation in Indonesia (attachment to Presidential Decree No. 57/2017 about SDGs, 2017). Based on the report of Indonesia Agency for Meteorology, Climatology, and Geophysics in 2017, Sumatra, Bali, Kupang and almost all areas in Java have dwindling water deposits in which the availability is below 40%. This cautionary state of water deposits can be heightened with the presence of 535 mining companies in the stated areas above. Mining companies are in the category of industry that

is in the natural resources business and therefore, must deliver their social and environmental responsibilities and reports based on The Limited Liability Law no. 40/2007.

This paper adopts the social contract theory in exploring water accountability and accounting practices by mining companies in Sumatra, Bali, Kupang and Java. The theory posits the need for accountability to stakeholders. This can lead to sustainability reporting with possibilities of varied standards and terms (Gray, Owen & Maunders, 1988). Furthermore, as the theory is based on social accountability, the legal requirement of reporting is of a peripheral issue in this paper. Accountability itself is an important issue in sustainability as it refers to the ability of stakeholders to gather information from entities on their sustainability activities and performance.

Online public sustainability reports of mining companies in Sumatra, Bali, Kupang and Java from 2014 to 2016 are the data source. The reports are from 2014 to 2016 as UNSDGs itself was declared in 2015. In 2017 the Presidential Decree on Indonesian SDGs was implemented. Therefore, this paper explores the practices of water accountability and accounting before the formal implementation of SDGs in Indonesia. After finding companies with consecutive water accountability through their online reports, the areas of their water accounting are explored. Those areas represent their water accounting practices disclosed as a form of accountability.

In terms of water accountability, the majority of studied companies have irregular sustainability reports online and even fewer report their water use over consecutive years. As for water accounting, the majority of mining companies that have water disclosures from 2014-2016 demonstrate water accounting practices that are either based on GRI G4 Framework or using other measurements. Furthermore, water accounting areas change between years. This indicates the developing state of water accounting practices in the studied companies. Limitations of the research and suggestions for future research are presented in the conclusion section.

LITERATURE REVIEW

Accountability and Accounting in Sustainability

Accountability to stakeholders is a topic within sustainability studies that has received massive attention as it is a significant part of stakeholder rights, i.e. to hold an entity accountable for the resources rendered to the entity by its stakeholders. This concept of stakeholder rights can be found in social contract theory. Under social contract theory, accountability is connected to reporting to public with an understanding that the terms and standards of the accountability under this social contract theory may change (Gray et al., 1988). This accountability understanding combined with approval-seeking behavior of an entity leads to legitimation behavior as in legitimacy theory (Deegan, 2002). When an entity embraces changes in its structures and systems to adjust to and to meet social expectations in accountability, then the entity is institutionalizing the accountability expectations.

The term accounting itself traditionally refers to how financial numbers resulting from economic transactions are calculated and reported mainly to creditors and shareholders (Mathews, 1995). Within the area of sustainability, the term accounting has a different interpretation. Starting as social accounting in the 1970s, accounting within the area of sustainability can be presented as related to social audits, silent social accounts and structured social accounts (Gray, 2001). Social audits are about public independent reviews on an accountable entity (Gray, 2001). Silent social accounts refer to those early accounts related to social and perhaps the environment; these are the results of mere reorganization of information that an entity already produced without significant effort (Gray, 2001). Systematic social accounts that measure social and environmental accounts leading to systematic reporting (Gray, 2001). This systematic reporting can be a part of accountability to stakeholders or self-justification (Gray, 2001). Therefore, the term accounting as related to sustainability can cover social and environmental accounts that can lead to systematic reporting either for the sake of stakeholders, self-justification, and/or public independent reviews.

In this paper, the use of the term water accounting refers to water accounts that lead to systematic reporting. Motivations on water account choices are beyond the current focus and stage of this paper although the possible reasonings for the disclosed water accounts are included in this paper. This limitation of the study leads to a more focused initiative in studying water accounting that at a later stage can expand to a study on motivations of choosing the accounts. The following sub-section presents prior studies related to water accounting and accountability.

Prior Studies in Water Accountability and Accounting

In regard to water, prior studies normally focus on water accounting. For example, a study on water accounting revealed a framework for water accounting called Water Accounting System (WAS) applied in the Australia. WAS collects data on water sources, availability, use and treatments (Turner, Baynes & McInnis, 2010). The data collected is aligned to the water accounts from the United Nations (UN). The WAS is one of a few water accounting systems developed in accordance with UN accounts for water.

In the area of consumer goods, the freshwater footprint has made a significant contribution to beverage products although the ingredients related to it comprise of small parts of the total weight of the products (Ercin, Aldaya & Hoekstra, 2011). The freshwater footprint accounting in the research is done by tracing the sources of the freshwater and consumption. Water source and consumption are parts of water accounting areas.

Variations of measurement methods in water accounting exist and lead to different results of water accounting data between the reported and the ‘in situ’ (Ansorge, Dlabal & Dostálova, 2016). Despite the variations, water sources, availability, use and treatments remain the main factors of the methods. Furthermore, prior water studies that relate the reporting, that is a form of accountability, to the accounting practices of water are lacking. Without linking water accountability to its accounting, stakeholders and practitioners

are unaware of the (1) the delivery of water information disclosure to stakeholders that at least by social rights can hold companies accountable for water source availability, and (2) measures that companies have taken to account for water conservation. These gaps of knowledge suggest the need to explore water accountability and accounting. The following section presents the urgency to study water accountability and accounting in Indonesia.

Indonesia Case for Water Accountability and Accounting

This paper aims to explore water accountability and accounting by taking Indonesia as the setting of the research. Water accounting and accountability are important issues in Indonesia because first, water is an important natural resource that is declining in many areas of Indonesia. Based on the 2017 report of the Indonesian Agency for Meteorology, Climatology, and Geophysics, water deposits availability in Sumatra, Bali, Kupang and almost all areas in Java is below 40%. This fact suggests that those areas will experience drought and can lead to lost access to water.

Second, the lost access to water will impact people and the environment. The probable condition leads to the second reason for the significance to study water accountability and accounting in Indonesia. Access to water is a part of the Indonesia SDGs points. Specifically, it is referred to as access to drinking water for poverty alleviation in Indonesia (attachment to Presidential Decree No. 57/2017 about SDGs, 2017).

Third, the areas with declining water deposits have mining companies with limited liability status that operate in natural resources businesses. Based on Limited Liability Law no. 40/2007 (1) all limited liability companies with operations involving or in natural resources must conduct programs in social and environmental areas, and (2) the social and environmental responsibilities must have a budget for reasonable implementations. This law is operationalized through Government Regulation No. 47 of 2012 about social and environmental responsibilities. The governmental regulation also refers to budgeted programs and implementations in which exemplary practices can be awarded by related government units. When programs are budgeted, measurements should be done, at least for monitoring and control. These represent the mandatory accounting aspect of sustainability programs for all limited liability companies that are in natural resources businesses such as mining companies.

In regard to water accountability in the form of reporting, there is a regulation related to public listed companies in Indonesia. The Indonesian Financial Service Authority (*Otoritas Jasa Keuangan*, abbreviated as *OJK*) has published a regulation related to the annual report of public listed companies Indonesia in OJK No. 29/POJK.04.2016. In the regulation, an annual report must, at minimum, disclose information regarding social and environmental responsibilities among other matters. Therefore, for limited liability companies that are public listed, water accountability and accounting can be part of their environmental reporting.

This paper adopts the social contract theory for analyzing water accountability and accounting in Indonesia. Under the social contract theory,

accountability to stakeholders are (1) social accountability rather than strictly legal accountability, and that (2) standards and terms related to the accountability can vary and change over time (Gray et al., 1988). As water accountability in this paper is observed through the online public sustainability reports, the mandatory or voluntary base of the reporting becomes a peripheral issue. The focus of the paper is to explore water accountability within any format of sustainability reports available online and the disclosed water accounting practices in terms of the areas of the water accounting.

MATERIALS AND METHODS

This paper focuses on a qualitative approach to answer the following research question: *'How are the practices of water accountability and accounting in Indonesia within mining intensive and declining water deposit areas?'* Water accountability and accounting practices in Indonesia is not yet receiving much attention in sustainability studies.

As the practices are limitedly known especially in areas with water limitations, yet which are mining intensive, a study that describes current practices can encourage further improvements on water accountability and accounting for water sustainability in the areas and Indonesia. This expected contribution to practices reflects the pragmatic perspective employed in this paper. The pragmatic perspective that is applied in this paper refers to matters that will be workable in certain situation or time as explained in Creswell (2007).

The paper adopts a cross units case study approach of qualitative method in which (1) the general practices of water accountability are explored by descriptively counting on water accounting disclosures followed by (2) an exploration on the practices done by companies that routinely disclosed their water accounting in terms of areas of water accounting disclosed.

Archival data is the main source of data. The archival data involves sustainability reports from 2014 to 2016 that are online and publically available. The online sources of the reports are the companies' websites. The use of sustainability reports to analyze sustainability practices are common practice in sustainability studies. For example, some studies on Fortune Global companies' sustainability disclosures and assurance use sustainability reports of the companies (Kolk, 2003; Kolk, Walhain & van de Wateringen, 2001; Fortanier & Kolk, 2007). The use of sustainability reports for studying companies' sustainability practices suggests that the sustainability practices seem likely to be implemented (Kolk, 2004).

Data was collected as following. Water accountability samples were based on the whole population of mining companies in Sumatra, Bali, Kupang and Java. The identification of mining companies was done by checking the online mining company source of the Ministry of Energy and Mineral Resources 2017 for Sumatra, Bali, Kupang and Java. A recheck on the list was done in April 2018 for validity of the companies listed. The list remains the same as per April 2018. Access to websites of the companies are all available using the company's name as the key word for searching in a browser. Table 1 Part A depicts the details of companies that posted their sustainability reports

online in their official websites between 2014 and 2016. Table 1 Part B presents information regarding the public listed status of the companies identified in Part A.

Table 1. *Availability of sustainability reports and the status of companies*

Part A. Online sustainability reports from company official websites

2014	2015	2016
15	15	16

Part B. Company status

Status	2014	2015	2016
Public listed company	11	12	13
Non-public listed company	4	3	2

Total companies in the list and checked: 535 companies

The following steps are the steps for collecting and analyzing data on water accounting practices:

1. Identification of companies that report their water accounting practices consecutively between 2014 and 2016.
2. Identification of themes:

a. First level theme: water. All disclosures of water accounting are searched and then categorized further into second level themes.

b. Second level themes: Through a loop process in which water accounting practices disclosed are explored, the following categories emerge: water sources, water volume recycled, water volume reused, water management, water consumption, water withdrawal, water scarcity, water input, water output, water used based sources, quality monitoring of water discharge, water management and conservation, water conservation, volume of waste water discharged.

3. Comparison of water accounting practices between years. Areas of water accounting practices identified as second level themes were the base of the comparison between years of each studied company. The results of this comparison were the basis of conclusions on water accounting practices.

While there is a possibility that water accounting by archival data can differ from the ‘in situ’ results, this paper adopts the ‘implementation likelihood’ understanding in studying the reports as introduced by Kolk (2004). Additionally, this paper attempts to describe water accounting practices rather than assessing the quality of the measurements as to the validity of the measurements reported and ‘in situ’. The topic on measurement quality deserves a fully-blown different study and belongs to another genre of knowledge. Table 2 shows the public listed status of the companies that disclose their water accounting practices consecutively from 2014 to 2016.

Throughout this paper we abbreviate the names of the companies studied to prevent any dispute at this stage of the research.

Table 2. *The status of companies with consecutive water accountability between 2014 and 2016*

Status	2014	2015	2016
Public listed company	3	3	3
Non-public listed company	4	4	4

RESULTS AND DISCUSSIONS

Water Accountability

The first focus of this paper is to explore water accountability practices of the studied mining companies. As stated in the methodology section, water accountability was explored by counting on the online disclosures of water accounting in sustainability reports. In total, there were 46 companies from 2014 to 2016 that had their sustainability reports published online. From the 15 companies that had online reports in 2014, nine companies disclosed their water accounting practices. The nine companies represented 60% of the total companies in 2014 that had sustainability reports and disclosed water accounting.

In 2015, there were 15 companies with sustainability reports but only 8 companies or 53% of the companies disclosed their water accounting. In 2016, 10 out of 16 companies, or 63% of the total companies with sustainability reports, disclosed their water accounting in their online sustainability reports.

Based on the numbers or percentages of water accounting disclosures from 2014 to 2016, only 58.6 % of those companies had water accounting practice disclosures. This result suggested that although water accounting was an important issue for Indonesia as related to Indonesia SDGs', i.e. poverty alleviation in terms of accesses to water, the disclosures that represented the accountability were limited. If accountability is a social contract as stated in Gray et al. (1988), more society approval seeking behavior beyond the legal context should be evident. In the context of this paper and to the extent of the companies studied, the approval seeking behavior should have inspired all studied companies.

From the total of 46 companies that published their sustainability reports publicly online within 2014 to 2016, only 7 companies disclosed their water accounting practices consecutively in 2014, 2015 and 2016. The rest of the companies disclosed their water accounting practices in an ad hoc manner. This ad hoc manner refers to their disclosure practices on water accounting that were observable in a certain year only. The seven companies were (1) AT, (2) BPI, (3) BIL, (4) ITAM, (5) PI (Bermuda), (6) PTR and, (7) BAS. All of these companies had online public and annual sustainability reports and included water accounting in their reports.

From an accountability perspective, as there are only seven companies that consecutively disclosed their water accounting practices in 2014 to 2016, water

accountability seemed to be a limited practice in the studied companies. Referring to the social contract theory, the practices should have been covered by the 46 companies. This result was similar to the result of a study on Fortune Global 250 companies in which reports were consistent and inconsistent besides being emerging as opposed to comprehensive (Kolk & van Tulder, 2010). In this case, the limited water accountability indicated an emerging state to water accountability in sustainability reports of the companies.

Water Accounting

The second focus of this paper was to explore water accounting practices by mining companies studied based on the disclosed practices. There were 7 companies that consecutively disclosed their water accounting practices between 2014 and 2016. The following were the descriptions of water accounting practices by the companies. The water accounting areas were based on the second level themes stated in the method.

1. AT

In disclosing their water accounting practices, AT adopted GRI G4 sustainability report frameworks. Water accounting practices of the company reportedly included water sources, water volume recycled, and water volume reused in 2014. In 2015 and 2016, similar water accounting practices as in 2014 were found.

2. BPI

Water accounting practices in BPI varied between 2015 and 2016. From 2014 and 2015, BPI reported water accounting in terms of water management, water consumption and water recycled. In 2016, the water accounting practices increased to include water withdrawal and water scarcity besides those already adopted in 2014 and 2015.

3. BIL

BIL reported similar water accounting practices from 2014 to 2016. Its water accounting practices included water input, water output and water recycling.

4. ITAM

The company adopted GRI G4 sustainability report framework. The company reported slight variations in their water accounting practices from 2014 to 2016. In 2014, the company reportedly practiced water used based on water sources and volume of reused water. In 2015, the company reported water used based on water sources and quality monitoring of water discharge. In 2016, the company water accounting practices covered water used based on water sources, volume of reused water and quality monitoring of water discharge.

5. PI

In 2014, water accounting practices in the company covered water management, water consumption and water recycled. These areas of practices were consistent from 2014 to 2016.

6. PTR

The company adopted GRI G4 for disclosing their sustainability activities. Water accounting practices areas included water management and

conservation, and water used based on sources. These general areas of water accounting practices were consistent from 2014 to 2016.

7. BAS

GRI G4 was the base of the company sustainability report. Water accounting practices in 2014 included volume of water consumed and water conservation conducted. In 2015, the practices covered water volume consumed and volume of waste water discharged to the environment. In 2016 the areas of water accounting practices remained as was in 2015.

The exploration of water accounting above suggested the following:

1. Water accounting practices can slightly vary from year to year as per the disclosed practices. This finding was apparent in BAS, ITAM, and BPI.
2. Some of the companies studied adopted a sustainability reporting framework as the basis of their water accounting practices and reports. This finding was apparent in BAS, PTR, ITAM, and AT that adopted GRI G4.

Referring to the social contract theory, the presence of water accounting practices above suggested efforts to provide information to stakeholders regarding water resources consumed and discharged. Meanwhile, the variations of the practices indicated emerging practices that might be due to changing operations in the companies and/or learning processes. This emerging practice indication of the water accounting fits into the possibilities of emerging practices presented in sustainability reports (Kolk & van Tulder, 2010). Alternatively, a study on environmental disclosure choices in annual reports using legitimacy theory found that the least favored reason for disclosures is to conform to societal expectations (O'Donovan, 2002). This reasoning may also explain the lack of social approval seeking behavior of the studied companies.

Additionally, political visibility might be a factor that moderates the attitude on sustainability disclosure. A study on sustainability reports and corporate governance with political visibility as a moderating variable suggests a positive effect of political visibility in moderating sustainability disclosure and governance practices in Indonesia (Panjaitan, 2017). Political visibility in the paper was measured by the log of total asset as bigger companies assumed to receive more benefits from sustainability disclosures. Similarly, choices among water accounting practices disclosed in the studied companies might be moderated by political visibility. This possibility will need further research.

CONCLUSIONS

The following are the conclusions based on the water accountability and accounting in the companies studied. First, the majority of the mining companies had irregular sustainability reports online. Even fewer reported water accounting. These results indicated that water accountability through systematically reported online disclosures was of a low precedence in the studied companies. Second, the majority of mining companies that had consecutive water accounting disclosures from 2014-2016, demonstrated varied water accounting practices. The varied practices indicated emerging water accounting practices. These emerging practices should be encouraged

further to include all other mining companies that have not disclosed publicly their water accounting practices and those that have not published any sustainability reports. Furthermore, political visibility might be an important variable to explain the lack of disclosures. Therefore, future studies can attempt to integrate and develop this variable and its measurements in studying the effect of the variable on water accounting approached through its disclosures.

Furthermore, based on the results, questions can be raised on the likelihood of the mining companies in the studied areas to support Indonesia SDGs in access to water as part of poverty alleviation in Indonesia. Only 7 companies consecutively demonstrated emerging efforts for water accountability and accounting. By adopting the implementation likelihood as in Kolk (2004), water accountability through public reporting and water accounting through disclosed practices are important aspects for stakeholders to understand how companies are consuming and discharging water. Future studies should attempt to follow water accountability and accounting development in Indonesia after the implementation of the Presidential Decree in 2017. Additionally, further detail on the variations of water accounting offer insights into the impact of different measurements on water resource consumption and discharge reported.

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