Water governance disclosure: the role of integrated reporting in the food, beverage and tobacco industry

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Abstract

Purpose – The purpose of this paper is to investigate current practices of water governance disclosure in the food, beverage and tobacco industry and to determine whether the quality of disclosure has a positive association with integrated reporting (IR).

Design/methodology/approach – A water governance disclosure index was developed that used content analysis to code the latest standalone social, environmental and sustainability reports or integrated reports of 49 companies in the food, beverage and tobacco industry. The selected companies are listed on three indices, the ASX, JSE and DJSI. This was followed by quantitatively testing the association between IR and the quality of water governance disclosure, as measured against the qualitatively developed index.

Findings – It was found that the 18 IR companies’ water governance disclosure quality significantly outperformed the 31 companies in the non-IR group, with a calculated index score of 71.67% and 40.97%, respectively.

Research limitations/implications – The evidence indicates that IR is superior to non-IR water governance disclosure, and the study, therefore, contributes to the literature around the legitimacy theory by concluding that IR is supportive to companies to legitimise their being.

Originality/value – The originality of this paper stems from the comparison of water governance disclosures between IR and non-IR firms. Considering that IR preparers outperformed companies in the non-IR group could provide insights to academics, regulators and reporting organisations that IR could be used to enhance water governance disclosure.

Keywords Food, Legitimacy theory, Integrated reporting, Disclosure, Water governance, Beverage and tobacco industry

Paper type Research paper
1. Introduction

Companies’ environmental efforts, ethical behaviour and corporate governance – including water governance – are becoming increasingly important to various stakeholders, which in turn affect business success (Tamimi and Sebastianelli, 2017). Companies, therefore, measure and report environmental information to increase transparency and ensure legitimacy (Delgado-Márquez et al., 2017; Cantele et al., 2018). Deegan et al. (2002) concur that sustainability accounting and reporting is used by companies as a vehicle to legitimise their actions. Consequently, the non-financial reporting, including social, environmental, human rights, anti-corruption policies, risk and performance, is an aid to companies to enhance their accountability-driven reporting (La Torre et al., 2020).

Water governance, as part of the “global water crises”, is identified as a continuing theme by the annual United Nations (UN) World Water Assessment Programme’s (WWAP) World Water Development Reports [United Nations World Water Assessment Programme (WWAP), 2016]. Water governance can be considered as an overarching corporate framework where objectives are set, strategies are formulated and the outcomes are controlled (Woodhouse and Muller, 2017). Besides, the failure of water systems is also often considered a governance issue (Guppy and Anderson, 2017). The World Economic Forum (WEF) mentioned that water governance is necessary to accommodate the growing population, to assist economic development and to adapt to climate change (World Economic Forum, 2016). Increasingly, policymakers, governments and researchers refer to the interconnection between water, energy and food as the “nexus” (Leck et al., 2015). Consequently, this article purposely selected to investigate the water governance disclosure, because at the core is natural resource scarcities and the recognition that water, energy and food are interlinked with insightful consequences for human well-being, poverty and inequality (Leck et al., 2015; Halbe et al., 2015). This paper is demarcated to the water governance disclosure of 49 selected companies’ disclosure in the food, beverage and tobacco industry, which are listed on three indices: the ASX (Australia), JSE Ltd (South Africa) and Dow Jones Sustainability Index (DJSI).

The idea of managing, measuring and reporting on the three elements of an organisation’s social, environmental and economic impacts gained prominence and is recognised as the triple bottom line (TBL) (Dumay et al., 2016). During the past two decades, there has been a tendency among companies to separate social and environmental disclosures into distinct standalone reports. This resulted in a wide range of issues to disclose to meet the expectations of various stakeholders, with the reports becoming long and more complex (De Villiers et al., 2014). Bernardi and Stark (2018) mentioned that these traditional standalone reports, which attempt to provide non-financial information related to environmental and societal activities, lack integration and tend to put the information into compartments. This was corroborated by Lozano and Huisingh (2011) and Pavlopoulos et al. (2017) who mentioned this compartmentalisation resulted in stakeholders experiencing problems to link and connect information effectively to evaluate the company’s business performance, strategy and value creation. Subsequently, in August 2010, the Prince’s Accounting for Sustainability Project (A4S) and the Global Reporting Initiative (GRI) announced the formation of the International Integrated Reporting Council (IIRC) (Eccles and Serafeim, 2011). The IIRC aims to forge a global consensus on the direction in which reporting needs to evolve where integrated thinking is embedded within mainstream business practices facilitated by integrated reporting (IR) [International Integrated
Reporting Council (IIRC), 2011, 2013]. As stakeholders have questioned the relevance and reliability of annual financial reports as a basis for making decisions about a company, there was a move towards a more integrated approach [Integrated Reporting Committee of South Africa (IRCSA), 2011].

From the above discussion, it is clear that the current debate is about the superiority of IR in comparison to the traditional standalone reporting. IR was introduced to address the shortcomings of the traditional standalone reporting and advocate that it enhances the quality of disclosure to stakeholders. In context of this study, the quality of disclosure is defined as that companies include useful information about water management in their reports, but that compliance as opposed to ethical behaviour, was the motivation (Sánchez-Hernández et al., 2017). Nevertheless, in the light of criticism to financial reporting not satisfying the needs of all stakeholders seeking social and environmental information, companies encounter more pressure to act in sustainable ways and to be more transparent about their sustainability practices (Lozano and Huisingh, 2011; Bernardi and Stark, 2018).

Stacchezzini et al. (2016) aimed to determine whether IR favours the integrative management of sustainability by conveying unbiased disclosures that are related to a company. In this regard, they analysed 54 integrated reports and investigated how the adopters of IR can incorporate their sustainability actions into their disclosures. The results indicate that the firms analysed do not integrate sustainable management accounting with sustainability reporting, resulting in disclosures appearing inadequate towards managing sustainability. It also reveals that IR, at the stage of investigation, has not overcome the limitations of other sustainability reporting initiatives, and that quantitative and forward-looking information is still inadequate (Stacchezzini et al., 2016). In another study, also comparing IR with standalone reporting, Rupley et al. (2017) found that IR predominately covers economic and social performance indicators but with little focus on governance. In this vein, many other studies also joined the debate and compared IR and standalone reporting (Reimsbach et al., 2018; De Villiers and Sharma, 2020), or emphasised the usefulness of IR (Nicolò et al., 2020; Landau et al., 2020) or advocate the need to improve IR, e.g. Frias-Aceituno et al. (2013), Perego et al. (2016), Eccles and Saltzman (2011), Flower (2015) and Adams (2015). This necessitates further investigation into the role of IR in practice.

Windolph et al. (2014) mentioned that the legitimacy theory stipulates that corporate social responsibility (CSR) governance could be argued as the company’s intention to pursue its moral legitimacy. Wang and Sarkis (2017) added that companies may engage in two types of CSR strategies to build legitimacy, namely:

1. taking serious action and being committed to environmentally and socially responsible behaviour; and
2. engaging in symbolic CSR governance to improve corporate image known as “greenwashing”.

Some organisations engage in CSR and disclose information based on external pressures they consider to be acceptable because they operate within boundaries and rules according to the expectations of their stakeholders. In this context, the disclosure of information appears to be an instrument to legitimise the organisation (Branco and Rodrigues, 2008).

In the context of this paper, it can, therefore, be argued that IR is superior to traditional sustainability reporting because at the heart of IR is integrated thinking (Moolman et al., 2016), or stated differently, IR and integrated thinking are inter-related instruments (Al-Htaybat and von Alberti-Alhtaybat, 2018; Guthrie et al., 2017). However, relevant to this
study, the latter takes into account, among others, how a company responds to its external environment by adapting its business model and strategies [International Integrated Reporting Council (IIRC), 2013].

With IR regarded as an improvement on traditional sustainability reporting, and because water governance is such a crucial topic in the sustainability of life on earth, the research question arises whether IR favours the quality of water governance disclosure in the food, beverage and tobacco industry? The purpose of the paper was therefore to investigate the mentioned industry’s current practices of water governance disclosure and whether the quality of the disclosure has a positive association with IR. This study was done within the conceptual frame of the legitimacy theory. Therefore, it was necessary to investigate current water governance disclosure practices and to find evidence of whether sustainability reporting on all constructs of water governance is used by companies as a vehicle to legitimise their being. To reach the objective, a mixed methodological approach was followed, where a water governance disclosure index was qualitatively developed (inductive) that used content analysis to code the latest stand-alone social, environmental and sustainability reports or integrated reports of 49 companies in the food, beverage and tobacco industry. This is followed by quantitatively testing the association between IR and the quality of water governance disclosure (deductive), as measured against the developed index.

The novelty of this paper stems from the comparison of water governance disclosure qualities between IR and non-IR firms. It was found that the sampled IR preparers outperformed the non-IR group, which could provide insights and arguments for future research to inform whether adopting IR affects sustainability disclosure. In this sense, the paper provides evidence to support the argument that IR enhances the quality of water governance disclosure to enable companies to legitimise their existence to survive.

Section 2 is a literature review covering the main concepts of integrated reporting, water governance and the legitimacy theory. Section 3 explains the research design and method. Section 4 included the development of a water disclosure index and hypothesis development. The hypothesis, the association between IR and the quality of water governance disclosure, was tested in Section 5. The article is concluded in Section 6.

2. Literature review
2.1 Integrated reporting
Dumay et al. (2017) identified three distinct models for IR, and argue that different versions could confuse practitioners in knowing which one should be adopted. The IIRC outlined a model in 2013 when they released the International Integrated Reporting Framework (IIRF), which is an integral part of the latest King IV corporate governance guidelines [International Integrated Reporting Council (IIRC), 2013; Institute of Directors in Southern Africa (IoDSA), 2016]. King IV, which was published in 2016, advocates for an “outcome-based approach”, which determines that companies listed on the Johannesburg Security Exchange (JSE) in South Africa could prepare an IR in any format – as long as they adhere to all the governance principles of King IV on an “apply and explain” basis [Institute of Directors in Southern Africa (IoDSA), 2016; Dumay et al., 2017; Du Toit et al., 2017]. This reveals some misunderstandings in the literature about the listing requirements of the JSE that the production of an IR is not a mandatory principle, as long as South African companies produce reports that comply with the substance of the King IV corporate governance guidelines or with the requirements of the JSE (De Villiers et al., 2016).

One of the fundamental concepts underpinning King IV is integrated thinking, which entails that an organisation should consider its various operating and functional units,
together with the capitals used or affected [Institute of Directors in Southern Africa (IoDSA), 2016]. Al-Htaybat and von Alberti-Alhtaybat (2018) conclude, in the context of their study, that IR relates to integrated thinking, and acts as an extension and reporting mechanism of integrated thinking. The focus of this paper is water – which is part of natural capital. Dumay et al. (2017) recognise that integrated thinking requires managers to conceptualise several factors that combine each of the capitals that may be useful for senior management. In this regard, Guthrie et al. (2017) studied five Italian public sector firms and concluded that all of them embraced integrated thinking as fundamental to change their strategies. Similarly, Hassan et al. (2019) found that UK higher education institutions began adopting the integrated thinking approach to report on their activities. Feng et al. (2017) investigated how key IR stakeholders in Australia interpret integrated thinking – and despite disparate interpretations – there was evidence of integrated thinking praxis in the following areas: active board and management involvement in IR, cross-organisational teams responsible for integrated reports and more integrated links between capitals and strategy in IR.

IR emphasises the incorporation of TBL and sustainability reporting into annual reports, to serve as an indication of what businesses have done and plan to do to contribute to society. Sustainability reporting has become an increasingly needed and common practice by companies to meet the expectations of various stakeholders. A broad array of stakeholders are continually demanding that companies provide transparent disclosure on multiple dimensions of the TBL (Hahn and Kühnen, 2013; Maubane et al., 2014). To fulfil these expectations and to respond to the pressures and criticisms of stakeholders, companies have to communicate their business activities and the impact thereof on the environment and society (Boiral, 2013; Akhter and Dey, 2017).

Many studies compared IR with traditional standalone reporting. For example, Reimsbach et al. (2018) investigated how the choice of the reporting format interacts with voluntary assurance and sustainability information. They found that both these elements positively affected investors’ evaluation of a firm’s sustainability performance. However, assurance was weaker with regard to IR than in the case of standalone reporting. De Villiers and Sharma (2020) examine how intellectual capital is reported under different reporting forms. They did a critical reflection study and found that IR is unlikely to subsume traditional reporting. On the other hand, other studies confirmed IR’s superiority to standalone reporting. For example, Nicolò et al. (2020) investigated the effects of mandatory reporting requirements according to the European Union Directive on the level of IR on state-owned enterprises. They found a fair level of IR disclosure, especially with regard to sustainable development goals, which emphasised the usefulness of IR. Landau et al. (2020) examined the actual value of 50 European companies when adopting IR. The results showed a negative effect on the market value. However, they concluded that the quality of IR is relevant for market valuation, and that the negative effect is the result of the quality of the reports.

The above mixed results emphasize the need to improve IR, e.g. Frias-Aceituno et al. (2013) who studied 750 international companies during 2008 to 2010 and advocate a more pluralist approach that takes stakeholders, sustainability, business ethics and transparency into account. Perego et al. (2016) presented qualitative findings from interviews with three specialists and field entrepreneurs of IR. The interviewees agreed that current IR initiatives developed in isolation, and consequently, any form of comparison between disclosed information on sustainability practices remains extremely difficult (Perego et al., 2016). All three specialists identified the pressing need to scale up the dispersion of IR thinking and practice, revealing that the diffusion of IR practices requires greater engagement with investors and academics (Perego et al., 2016). This view connects with
Eccles and Saltzman (2011), stating that IR benefits improved internal resource allocation and greater stakeholder engagement. However, the integration of information is still lacking in the sense that financial and non-financial information regarding the tangible and intangible capitals is not integrated (Eccles and Saltzman, 2011). Furthermore, Flower (2015) critiques IR on the extent to which it addresses sustainability and anticipates that IR will have little effect on corporate practices. However, Adams (2015) argues that sustainability is not the main purpose of IR, and that many businesses are adopting IR. Adams (2015) expands that internationally, regulation is increasingly requiring the disclosure of strategy, risks and business model information in annual reports.

2.2 Water governance
Excluding that water governance embraces mainly rules and regulations, other value-related issues such as responsibility, accountability, transparency, equity and fairness are also important to address (Tortajada, 2010). Furthermore, “yesterdays” approaches and solutions will mostly fall short for globally better living and quality of life (Biswas and Tortajada, 2010). An example of contemporary practices is that companies that have board-level oversight of water issues are reaping the rewards of market differentiation, shareholder confidence and business resilience (CDP, 2017a). Corporate water stewardship is an approach that allows companies to identify and manage water-related risks and impacts they face in their direct operations and value chain, seizing water-related opportunities (CDP, 2017b). In a study investigating 20 Indonesian manufacturing companies, Dwianika et al. (2020) found that the firms’ performances are positively related to water awareness, accountability awareness and corporate governance. In the context that companies disclose sustainable development to gain legitimacy from stakeholders, Cantele et al. (2018) found that sustainability is mainly a communication tool. Therefore, they suggest the need for a new international industrial-specific reporting standard.

The GRI, which consists of lists of metrics related to sustainability, is arguably currently the most widely reported initiative used by companies [Fonseca et al., 2012; Global Reporting Initiative (GRI), 2013]. The GRI 103, which deals with governance and management approach issues, requires the following for each material topic [Global Reporting Initiative (GRI), 2016]:

- an explanation of how the company manages the topic;
- a statement of the purpose of the management approach; and
- a description of the following, if the management approach includes that component: policies, commitments, goals and targets, responsibilities, resources, grievance mechanisms and specific actions such as processes, projects, programmes and initiatives.

The new GRI 303 water standard is one of the first GRI standards to be updated. This was done through a robust, multi-stakeholder approach. The GSSB, the GRI’s independent standard-setting body, appointed a project working group to review GRI 303: Water. The changes aim to improve the quality and usefulness of the organisation’s water impacts, to improve comparability and ultimately transparency in water reporting [Global Reporting Initiative (GRI), 2017].

2.3 Legitimacy theory
This study is performed within the conceptual scope of the legitimacy theory. This theory highlights that a company should consider the rights of the public at large and not only the
rights and needs of its investors (Lokuwaduge and Heenetigala, 2017). According to Deegan (2014), the legitimacy theory does not provide prescription about what management should do, but rather seeks to explain or predict particular managerial activities. To disclose company operations and how the company is managing its resources are projected to have a positive impact on stakeholders’ views to legitimise the actions of a company. The legitimacy theory could, for example, be reflected in South Africa, where companies should produce reports that comply with the substance of King III or King IV, corporate guidelines or with the requirements of the JSE.

According to Remali et al. (2016), it is evident that there is an interdependency that exits between human beings, the ecosystem and a company’s reliance on water to operate, which refers to a social contract between a company and the larger society. Orr et al. (2016) confirm this view that the legitimacy of water “governance is not separated from its institutional context and cannot be considered in isolation”. Godden and Ison (2019) also concluded, in this regard, that water governance can be better legitimised if society is engaged. However, Gupta et al. (2013) concluded in their study that there is a vacuum in global water governance, implying that there is an absence of strong and legitimate institutions that encourage water governance. In this sense, water disclosure is needed to legitimise the company’s contract with society, and the legitimacy theory is therefore applicable to this study.

3. Research design and method
This study drew inspiration from the research of Dumay and Cai (2015) in an attempt to implement Krippendorff’s (2013) framework for content analysis and to apply a mixed methodological approach. The first part of the empirical study is qualitative and comprises inductive reasoning, where a general, yet unique water governance disclosure index was developed, which were broken up into constructs. This is followed by a quantitative phase that involves deductive reasoning, where hypotheses were tested.

3.1 Design and layout of the study
After Australia, Africa is the second-most arid continent, and water scarcity has become a critical issue as populations grow and climate change continues to affect rainfall patterns (Besada and Werner, 2014). As industrialisation and urbanisation increases in South Africa, water consumption has grown to a point where demand exceeds supply. As such, South Africa is classified as one of Africa’s water-stressed countries (Tewari, 2009). Consequently, the food, beverage and tobacco industries of South Africa and Australia were selected to be investigated as IR and traditional standalone financial and sustainability reports were publicly available. However – considering that water is a global concern – the listing requirements of the DJSI provided a global perspective and comparison towards the best practices in the food, beverage and tobacco industry.

A sample of 49 companies listed in the food, beverage and tobacco industry on three indices, the JSE Limited (JSE), Australian Security Exchange (ASX) and DJSI, were taken. The sample companies were divided into two groups, those who prepare IR and those who use traditional standalone financial and sustainability reporting – referred to as non-IR. The study was arranged into two phases.

The first phase included a literature review and an empirical content analysis of current water governance disclosure in sustainability, integrated and standalone financial reports. Through the content analysis of the 49 companies’ current water governance reporting, five constructs (themes) were identified, which established the basis to develop a water governance disclosure index. Through a process of coding the narrative water governance
reporting, a water governance disclosure index score was calculated. These five constructs were summarised into hypotheses.

The second phase was a quantitative analysis to empirically test the hypotheses. In light of the argument that IR is superior to traditional reporting and disclosure, the study aims to test the following main hypothesis:

\[ H_{(main)}: \text{There is a significant positive association between IR and the quality of water-related disclosure on governance.} \]

This hypothesis is tested within the conceptual scope that the superiority of IR over traditional annual and sustainability reporting is used as a vehicle to legitimise a company’s being. From the literature, we further refined water governance and developed five more sub-hypotheses, one for each construct. Statistical analyses included an analysis of means and an analysis of relationships.

3.2 Sample

In South Africa, all 18 companies listed in the food, beverage and tobacco industry group of the JSE Ltd were selected. On the ASX index in Australia, 26 companies were detected under the food, beverage and tobacco industry. The 20 largest companies, per market capitalisation, were selected. Thirteen companies on the DJSI adhere to the listing requirements of the index and formed part of this study. From the 51 companies \((18 + 20 + 13)\), Libstar Holdings Ltd was omitted as they were a new company without sustainability reports, and British American Tobacco was a dual listing on both the JSE and DJSI and was reckoned only under the DJSI to compare global best practices. Consequently, the sample consisted of 49 companies. The standalone social, environmental and accounting reports or integrated reports of the companies were extracted. The latest reports that were available during the period November 2018 to February 2019, when the empirical study was conducted, were used. Appendix exhibits the list of all the selected companies. (Note that the sample size almost represents the population fully; therefore, the statistical analysis is interpreted as such of a population.)

4. Development of a water governance disclosure index and hypotheses development

4.1 Empirical content analysis

The previous version of the GRI guidelines, the latest GRI 103 and GRI 303, the Carbon Disclosure Project (CDP), the GRI sector guidance for food and beverage processing and grounded literature on water reporting identified, were used as a basis to find constructs/themes in the reports of the sampled companies to develop a water governance disclosure framework. This is consistent with the study of Weber and Hogberg-Saunders (2018) who used the GRI as a basis to develop the water risk benchmarking framework applied in their study.

The information referred to above was combined in the process of developing the water disclosure index in the qualitative part of the mixed methodological approach. Computer-based content analysis was considered; however, the manual method was chosen, because: in addition to publishing an integrated or sustainability report, some companies provided extensive information through interactive web pages, which could be difficult to enter into a computer-aided programme and qualitative information was gathered from the reports to emphasise companies’ legitimacy, which required careful thought and in-depth reading. The principal researcher did the initial content analysis to identify themes. A similar analysis
was done by another independent senior academic from management sciences with environmental accountancy experience (not a co-author) to ensure that important information was not overlooked. Water governance disclosure as the main construct was then deliberated at a colloquium of experienced persons.

To refine the water disclosure index, the next step was to describe each construct/theme by adding/moving items and providing additional information towards that specific theme. Within this process, information was reallocated to relevant constructs with the reasons therefor contained in the remarks column.

From this process, five sub-constructs featured in the main governance construct (G1–G5), where G1 identified whether the company has an environmental management system (EMS) and developed its water strategy. Concerning the second construct (G2), the reporting organisation should indicate that it understands the context within which it operates in terms of water stress, flooding, water quality and regulatory uncertainty. The company should include water-related aspects as part of their business model (G3) and disclose that water governance is embedded in its organisational structure at the board level (G4). Within the fifth construct (G5), the company should disclose detailed information about its water policies, commitments, resources, projects, programmes and initiatives.

4.2 Hypothesis development
This section is a discussion of the five constructs to refine the main hypothesis. In this section, there are references to examples of “best practices” of water governance, as Biswas and Tortajada (2010) suggest that identifying such best practices can serve as benchmarks for similar companies in different countries.

4.2.1 Environmental management systems (EMS). Natural resources such as land, air and water should be used wisely and sustainably to ensure a healthy environment for present and future generations (Ekins, 2002). There are a large number of factors driving a company to report on environmental issues such as international standards, mandatory national requirements, a competitive advantage, investment opportunities or stakeholder pressures (Pahuja, 2007). Accounting for environmental issues and environmental information is important in advancing sustainable development and holds the key to successful accountability inter-relationships between an organisation and its stakeholders (Schaltegger and Burritt, 2017). Transparency, as part of environmental reporting, requires companies to commit to collecting and disclosing detailed information on governance, social and environmental aspects.

Concerning this construct, Ingham’s (2018), an ASX listed company operating in the poultry industry in Australia and New Zealand, indicates the importance of EMSs as follows: “The Group takes its environmental obligations seriously and has had an environmental policy in place for more than 30 years”. The company continues to explain that the policy contains a commitment to protect the environment, including water, energy and material conservation (Ingham’s, 2018). This company discloses their EMS to legitimise their existence by indicating their importance to society: “Ingham’s is now recognised as a leader in sustainability and aims to lead the world in the continued adoption of advanced water treatment to reduce water use” (Ingham’s 2018).

To determine whether a company has an environmental management system, which may legitimise their existence, the GRI (2013) includes the following question: “Does the company develop its own water strategy?” In the context of this study, the following is hypothesised:
There is a significant positive association between IR and the quality of water-related disclosure on governance in terms of EMS and strategies.

4.2.2 Context in which the firm operates. From 2017 to 2050, it is projected that half of the world’s population growth will be concentrated in just nine countries, namely, India, Nigeria, Democratic Republic of the Congo, Pakistan, Ethiopia, United Republic of Tanzania, the USA, Uganda and Indonesia. It is clear that many of these countries are in Africa, and it is expected that the populations of 26 African countries will expand to at least double their current size in the same period (United Nations (UN), 2017). Other examples of the context are companies operating in Europe, with a developed infrastructure and abundant rainfall, where water security may appear to be of less concern. However, in the winter of 2015/2016, the UK experienced the worst flooding since 1947, severely affecting water quality (CDP, 2017b).

The following disclosure by Tongaat Hulett (2018), a South African agriculture and agri-processing business, presents an example of a company understanding the context within which it operates:

As an agriculture and agri-processing business, water is a vital part of Tongaat Hulett’s daily operations. Climate change, with its consequent impacts on water availability and water quality, continues to impact on several regions in which Tongaat Hulett and its suppliers operate. Water pollution has the potential to increase operational costs and compromise the quality of products.

In their business operations, Tongaat Hulett deals inter alia with climate change, water scarcity, water pollution, etc. They legitimise their role in society to emphasise their “[...] interest to ensure sustainable management of shared water resources in the regions where it operates and procures” (Tongaat Hulett, 2018).

In this regard, the previous version of the GRI report (Global Reporting Initiative (GRI), 2013) included the question: “Does the company indicate that it understands the context in which it operates in terms of water stress, flooding, water quality and regulation uncertainty?” Accordingly, from the perspective of this study, it is hypothesised that:

There is a significant positive association between IR and the quality of water-related disclosure on governance in terms of the context in which firms operate.

4.2.3 Water-related aspects as part of the business model. The inclusion of water issues as part of the company’s business model was evident in the study of 22 agri-food companies in South Africa by Sánchez-Hernández et al. (2017), and such an inclusion could be considered as one of the best practices in the field. This finding relates to IR and the integrative approach, as mentioned by Hoque (2017) where it was concluded that IR supports the improvement of the business model and strategy formulation of a company, because of its process of integrated thinking and decision-making support. Acknowledging water-related aspects as part of a company’s business model, RCL Foods (2018) reported:

“Guided by Our Sustainable Business Drive, we strive to apply alternative business models in our consumption of natural resources in order to achieve energy-efficient, water-smart and waste-free operations.”

As a result – driven by their new business model – RCL Foods (2018) reduced municipal water usage by 596 million litres. This “water-smart and waste-free” achievement is clear evidence of a company legitimising its existence by its positive role in society. As this study investigated whether IR is associated with improved water disclosure, the following is hypothesised:
There is a significant positive association between IR and the quality of water-related disclosure on governance in terms of a firm’s business model.

4.2.4 Board oversight of water governance. The board of directors is responsible for establishing appropriate mechanisms to monitor and control activities of a company and also to be accountable and transparent through the disclosure of information (Dias et al., 2017). This also applies to the disclosure of environmental information and the company being governed according to good corporate environmental principles – which include governance principles applicable to water disclosures. In the 2016 CDP Water Report, 92% of companies integrated water into their business strategies (highest of any sector), and 77% of companies had board-level oversight of a water policy or strategy (CDP, 2016).

General Mills (2018), a US food company listed on the DJSI, illustrates board-level oversight for water governance. The company’s leadership team is held accountable for the company’s global responsibility programmes and performance:

Quantum Foods (2018) provided an example of how the firm’s governance structures help achieve the outcome of legitimacy by mentioning that: “The board ensures legitimacy and accountability by approving the materiality of matters that are reported on by management”. This signifies that legitimacy is ensured by the integrated nature of reporting on sustainability matters by identifying and disclosing material items and then moving towards the governance structures, which are reported on. The fourth hypothesis is:

\[ H(4) \] There is a significant positive association between IR and the quality of water-related disclosure on governance in terms of board oversight.

4.2.5 Policies, commitments and programmes. The GRI 103, which deals with governance and management approach issues, requires the following for each material topic [Global Reporting Initiative (GRI), 2016]: An explanation of how the company manages the topic; a statement of the purpose of the management approach; and a description of the following, if the management approach includes that component: policies, commitments, goals and targets, responsibilities, resources, grievance mechanisms and specific actions such as processes, projects, programmes and initiatives.

Tongaat Hulett again discloses the importance of having water-related policies, commitments, goals and targets, responsibilities, grievance, mechanisms and specific actions such as processes, programmes and initiatives:

Tongaat Hulett recognises the need to adapt to the physical impacts of climate change, which may affect operations, particularly through the availability of water and the occurrence of extreme weather events. The company continues to engage with experts on several innovative initiatives, including programmes to improve irrigation efficiency and more drought-resistant crop varieties (Tongaat Hulett, 2018).

In the context of this study, that policies, commitments and programmes may be an aid to a company to achieve legitimacy in society, the following hypothesis was developed:

\[ H(5) \] There is a significant positive association between IR and the quality of water-related disclosure on governance in terms of policies, commitments and programmes.
4.3 Coding of the water governance disclosure index

The water disclosure index was developed in three stages. The process was initiated using the documents as listed in Section 4.1, which includes all the relevant information from the literature review to form the constructs. In the second stage, information was reallocated to relevant constructs with reasons contained in a remarks column. Lastly, a refined index for each element together with the coding instructions applicable to every construct was created. A quality description for each construct (G1–G5) in the water governance disclosure index was developed to improve the accuracy towards coding every item. The disclosure index was constructed to include an assessment scale (ordinal scale) to distinguish between poor and excellent disclosure of items (Hooks and Van Staden, 2011). The assessment scale ranging from the minimum (0) to the maximum (2) score is illustrated below. Table 1 exhibits a summary of the coding of the company characteristics and water governance disclosure constructs that was helpful to test the hypotheses.

Note that each water governance disclosure construct – G1 to G5 – was used to test the five sub-hypotheses, H1 to H5, and the sum of all the sub-constructs, G1 to G5, represents the main construct “water governance disclosure” that was used to test the main hypothesis (Hmain).

Strategies were put into place to ensure the credibility of the above qualitative research. Firstly, reliable sources such as the GRI and CDP were used in the analysis; secondly, an independent senior academic repeated the theme/construct identifying process, and the results were presented at a colloquium with highly qualified persons, and thirdly, results

| Governance constructs | Coding of water governance disclosure |
|-----------------------|---------------------------------------|
| G1: The company indicates that it has EMS, and developed its own strategy | No disclosure | The company has an EMS for water-related issues | The company has an EMS and incorporated it into its water strategy |
| G2: The company understands the context in which it operates in terms of water stress, flooding, water quality and regulatory uncertainty | No disclosure | Indicated that it understands the context | Provide more detail, such as flooding, water quality and regulatory uncertainty |
| G3: The company includes water-related aspects as part of its business model | No disclosure | Shows that water is part of its business model | Provide more detail on the business model and water |
| Establish the awareness of some structure in the governance of water by identifying the following: G4: The company has a director or senior staff member (board oversight) responsible for water governance | No disclosure | Has a senior representative for water governance | Very clearly (board oversight) embedded in the organisational structure |
| G5: The company has water-related: policies, commitments, goals and targets, responsibilities, grievance, mechanisms and specific actions such as processes, programmes, and initiatives | No disclosure | Indicates some policies and procedures | Detail information about policies, commitments, resources, projects, programmes and initiatives |

Table 1. Coding of water governance disclosure per construct
were often shared and discussed with two study promoters who also gave feedback. Prior to
the principal researcher conducting the content analysis on the standalone social,
environmental and accounting reports or integrated reports, pilot coding was performed by
an independent senior academic on 10% of the same companies in the sample. Results were
compared and minor differences between the comparisons were identified and discussed to
agree on further coding of each element within the water disclosure index.

To determine the internal consistency/reliability of the constructs listed in Table 1, the
Cronbach’s $\alpha$ coefficient was calculated. This measurement to determine if a concept is
consistent yielded a score of 0.909, which is above the general accepted level of 0.8, or even
0.7 in certain cases (Field, 2009), which indicates that there is a high degree of similarities
between the sub-constructs (G1 to G5).

5. Hypothesis testing

5.1 Variables

To test the hypotheses, it was necessary to separate the companies that adopted IR versus
those who still use traditional standalone reporting (non-IR companies). The companies’ IR
status was coded as 0 if a company implemented IR, and 1 if IR is not implemented by the
company. The disclosure index that was developed to quantify the quality water
governance disclosure is exhibited in Table 1, where a three-point assessment scale with
scores ranging from 0 (minimum) to 2 (maximum) was applied to measure the quality of
water disclosure.

To test the main hypothesis, the study inter alia used a multiple regression model, which
allowed for four control variables, namely, firm size, assurance, conciseness and countries.

Previous empirical studies have repeatedly found company size to be significantly
positively associated with CSR disclosure (Bhattacharyya, 2014; Zhou et al., 2018; Hassan
et al., 2019). More specifically, Burritt et al. (2016) found organisational size to be a
significant predictor of water-related disclosure. Therefore, the expectation is that the water
governance disclosure index score will be positively associated with the company size. In
this study, the logarithm of the total asset value of the firms was used as a proxy for size.

External assurance is one of the methods used to overcome the question of the credibility
and quality of information in sustainability reports (Junior et al., 2014; Haleb and Wohniak,
2016). Moreover, Braam et al. (2016) argue that the process of external assurance may induce
companies to produce and disclose more reliable and accurate environmental information.
With reference to the above studies, the expectation is that the water disclosure index score
will be positively associated with external assurance. In this study, a company was coded 0
for the existence of only internal assurance and was coded 1 for the existence of external
assurance.

Perego et al. (2016) stated that an analysis between the tension of conciseness and
completeness of the information disclosed could generate useful insights for both standard
setters and companies who embark on the IR movement. In essence, conciseness refers to the
ability of a firm to express material concepts clearly and in as few words as possible, which
could result in more concise reports. In this study, the number of pages was used as a
measure of conciseness and divided into four categories, namely, 0 to 70 pages (0), 71 to 140
pages (1), 141 to 210 pages (2) and more than 210 pages (3) to establish whether there is a
relationship between conciseness (report size) and water disclosure. Michelon et al. (2015)
provide evidence that standalone reports provide more information, but that this
information is diluted within other irrelevant pieces of information camouflaging important
items of disclosure. Following Michelon et al. (2015), the expectation is that the water
disclosure index score will be positively related to the conciseness of the reports.
This study analysed the water disclosures of companies listed on the JSE in South Africa, the ASX in Australia and global companies listed on the DJSI. As a consequence of different listing requirements, regulatory bodies and a variety of frameworks and rules applied – the distinction was made between the different indices to establish whether there is a relationship between a specific country and water disclosure. “Country” may be important in determining the water disclosure index score. As the three mentioned indices represent a nominal scale (i.e. there is no logical order between the three groups), three dichotomous (dummy) variables were used, namely, D1, D2 and D3, representing South Africa, Australia and global companies, respectively. To avoid the “dummy variable trap” (Asteriou and Hall, 2016), we only used D2 and D3 in the regression analysis, meaning that the expected index score differences of Australian and global companies listed on the DJSI are compared to those of South Africa alone.

5.2 Statistical analysis
To test the hypotheses, the study used both an analysis of means and an analysis of relationship. Concerning the former, t-tests and the Mann–Whitney test were used to determine whether there is a significant difference between the mean water governance disclosure index scores of the IR and non-IR groups. The relationship analysis was used to further test the main hypothesis, which firstly includes a correlation analysis to determine the relationship between the water governance disclosure index and IR status (IR/non-IR). Secondly, a regression analysis was performed to determine whether companies who adopted IR tend to be associated with a higher water governance disclosure index. Therefore, the water governance index score is the dependent variable, and IR status, the independent variable, together with the four above mentioned control variables. By including the control variables, the analysis may conclude whether the water governance index score and IR status are causally related. In other words, IR status is the cause and the index score the effect. As a population is assumed, the p-values are shown in the analysis for completeness and not really to infer from the sample to the population. However, it serves as a guide to test whether there is a statistically significant positive association between IR and the quality of water governance disclosure.

5.3 Results
5.3.1 Testing and discussion of H1 to H5. Table 1 was used to calculate a water governance disclosure score for each construct for each of the 49 sampled companies. The scale used in Table 1 (0, 1 and 2) was converted to percentages, which implies that the higher the percentage score, the higher is the quality of disclosure. A Cronbach’s α score for the main construct “governance” was calculated. A score of 0.909 was obtained, which is very good (Field, 2009), and denotes that the constructs within the main construct are relevant to test the developed hypotheses. Table 2 presents the results of the t-test for each construct within the governance construct.

It is evident from Table 2 that the 18 companies performing IR recorded higher mean percentages than the 31 non-IR companies in each construct (G1–G5). The most comprehensive difference [41.76% (61.11%–19.35%)] between companies performing IR or not could be pointed out in construct G3, which measured whether companies include water-related aspects as part of their business model. G3 was also found to be the lowest disclosure element. The highest disclosure construct was G2, where companies practising IR scored an average of 86.11% by illustrating an understanding of the context in which it operates – as opposed to 54.84% recorded by the non-IR group. A significant difference of 32.08% (61.11%–29.03%) was recorded between the IR and non-IR group of companies within the
construct reporting on board-level oversight for water governance (G4), where the IR companies scored 61.11% in contrast to an average of 29.03% by the non-IR group.

Note that although H1 is statistically significant at a 10% level, this indicates that there is only weak evidence that the quality of disclosure of water governance in terms of EMS for IR companies are higher than non-IR companies. However, this weak evidence is probably not enough to support the hypothesis. H2, H3, H4 and H5 are supported because there is overwhelming and strong evidence, p < 0.01 and p < 0.05, respectively, that companies’ water governance disclosure quality is statistically significantly higher when using IR than those companies who do not use IR.

5.3.2 Testing and discussion of Hmain. The main hypothesis is the sum of all the sub hypotheses. Similar to Table 2, a t-test for the main governance construct was performed where the association is measured between the differences of the two groups’ means, which signifies that the IR group (71.67%) outperforms the non-IR group (40.97%) in terms of governance disclosure. The p-value of 0.002 implies that Hmain – which stipulates that: “There is a significant positive association between IR and the quality of water-related disclosure on governance” – is supported. The non-parametric Mann–Whitney test confirmed the statistically significant difference in favour of the IR group with the exact same p-value of 0.002. Furthermore, both the t-test (Cohen’s d 0.993 > 0.8) and the Mann–Whitney test (effect size r = 0.45) indicate that the finding is of practical significance (Pietersen and Maree, 2016). Consequently, the index score difference (71.67%–40.97%) implies that the quality of disclosure of the IR companies is 30.7% higher than the non-IR companies. This finding is in line with authors such as Nicolò et al. (2020) and Landau et al. (2020) who also found that IR is superior to traditional standalone reporting.

The first of two relationship analyses that were conducted is Spearman’s correlation. The result is a coefficient, between the main governance construct’s index score and IR status, of rho = −0.456, which is statistically significant at a 1% level. This negative value implies a positive association between IR companies and water governance disclosure because IR is coded 0 and non-IR is coded 1. From this correlation analysis, Hmain is supported, which implies that should a company move from 1 (non-IR) to 0 (IR), the quality of disclosure should increase by 45.6%.

Table 3 presents the second relationship analysis, the multiple regression analysis.
The independent variable – IR status – recorded a p-value of 0.075 in the regression model. As the p-value lies between 5 and 10%, there is a weak unique contribution of IR status to the water governance disclosure quality (score). However, the relationship is not statistically significant on a 5% level to support \( H_{main} \). Nevertheless, again, as in the case of the correlation analysis, the result from the coding of IR (0) and non-IR (1), the negative beta \( (\beta = -23.913) \) and negative t \( (t = -1.828) \) values indicate that there is some positive influence of IR on the quality of water governance disclosure. \( \beta = -23.912 \) implies that, in this model, if IR changes from 1 (non-IR) to 0 (IR), such a change has the effect that the water governance disclosures’ quality improves almost by 24 percentage points. The standard error is similar to the standard deviation for a mean, the larger the value, the larger the spread from the regression line. As the independent variables are measured in terms of different scales, the standardised \( \beta \) values also indicate the relative importance of each independent variable in this model.

Company size is specified as the most important regressor to influence the water disclosure index score. Moreover, it had a unique positive statistically significant contribution related to the water governance disclosure score. Authors such as Bhattacharyya (2014), Burritt et al. (2016), Zhou et al. (2018) and Hassan et al. (2019) also found a positive association between firm size and the quality of reporting. Following the work of Michelon et al. (2015), the expectation was that there should be a positive association between the independent variable “conciseness” and the dependent variable, the water governance disclosure score. However, “conciseness” was insignificant negatively related to the dependent variable. Lastly, the dummy variables “Country Australia” and “Country Global” were insignificant \( (p > 0.05) \) to the water governance index score relatively to “Country South Africa”. Note that a correlation analysis was performed, which included assurance as a variable; however, it did not correlate with governance, and therefore was not included in the regression model as a control variable.

Lastly, the collinearity statistics indicate that multicollinearity is not a problem, because the tolerance scores are all above 0.1 and variance inflation factors (VIFs) are all below 10 (Pallant, 2016). To test for an unequal spread in the data, White’s test was performed to detect any form of heteroscedasticity. This is a measure to detect the existence of any correlation between independent variables and the residuals (error terms). The “heter"
indicates whether there is an “unequal spread”, and for our regression model, a $\chi^2$ value of 0.1132 > 0.05 implies that it can be accepted that the data is free from any heteroscedasticity (Asteriou and Hall, 2016). A further test was for the linearity of the data, namely, the ZRESID (standardized residuals value) versus the ZPRED (standardized predicted value) test. We conclude that the relationship between the responsive variable and the prediction is zero after a visual inspection of the scatterplot indicates that all the data points are well within the limits of $-3$ to $3$, and that the points are randomly spread throughout the whole area (Grande, 2015). Finally, to test whether residuals are correlated serially from one observation to the next, the Durbin–Watson score of 1.554 falls between the critical points of 1.5 to 2.5, implying there are no levels of such a correlation (Grande, 2015).

6. Conclusion

The statistical analyses provide overwhelming evidence that IR indeed favours the quality of water governance disclosure in the food, beverage and tobacco industry. Notwithstanding, the mean water governance disclosure scores of the IR (71.67%) and non-IR companies (40.97%) indicate that both groups, especially the latter, portray much room for improved water governance disclosures. Similarly, the qualitative examples of best practice disclosures further indicated that water governance is a powerful instrument to coordinate advances in areas in the food, beverage and tobacco industry to alleviate the global water crises.

The evidence in all the analyses:

- indicates that IR is superior to non-IR water governance disclosure; and
- imply a positive association between IR and water governance disclosure quality.

In the context that there is an interdependency between human beings, the ecosystem and a company’s reliance on water to operate, the study contributes to literature around the legitimacy theory by concluding that IR is supportive to companies to legitimise their being. Therefore, water disclosure is supportive to legitimise the company’s contract with society. In this sense, the results could reveal that an integrated approach, and integrated thinking is associated with improved water disclosures in the food, beverage and tobacco industry. The paper presents a novel comparison between IR and non-IR companies of water governance in the food, beverage and tobacco industry of the three indices of ASX, JSE Ltd and DJSI.

From the above conclusion that IR is superior to traditional reporting, it can be seen that adopting IR will lead to enhanced water governance reporting in the food, beverage and tobacco industry. Our argument is that this enhanced reporting will set best practice benchmarks in the industry. For example, as indicated in the hypothesis development section: Ingham’s (2018) water governance includes that an EMS policy be in place. Consequently, they aim to lead the world in water treatment and to reduce water use; Tongaat Hulett’s (2018) water governance set an example to ensure sustainable management of shared water resources; RCL Foods (2018) indicates how their water governance aims to achieve water-smart and waste-free operations; General Mills’ (2018) board takes responsibility to oversee water matters that may empower management to improve their water governance; and Tongaat Hulett’s (2018) water governance is evident of improved irrigation efficiency and drought-resistant crop varieties.

Implications due to good water governance practices observed from the analysis indicated initiatives towards water-related programmes, board-level oversight through leadership teams and reduced water usage within operations. It was evident that some firms understood their operating context regarding water-related issues such as water scarcity and responded with water governance initiatives. For example, the drought in the
Western Cape province of South Africa led to the sinking of boreholes, investing millions of rands in desalination plants and implementing water-use efficiency measures to keep factories operational.

Water management across large multinational companies is a complex issue and requires strong governance and management systems—consequently, the following recommendations can be made. Firstly, after identifying water as a material matter, water governance should be addressed in any firm operating in the food, beverage and tobacco industry. Secondly, a wide range of governance structures are required to manage water, such as environmental management systems, an explanation of the context in which the company operates, an indication of how water-related aspects are included in the business model, board-level oversight and policies, programmes and strategies. These are critical elements, which should not be overlooked.

The limitations of the study are that it is recognised that the elements included in the water governance disclosure index were compiled from multiple literature sources, applicable to different industries and that some elements could be omitted. Furthermore, the food, beverage and tobacco industry was purposefully selected as a water-intensive industry, which plays a significant role in agricultural water use within the concept of the WEF nexus. This restricted the sample size. Moreover, only sampling firms in the food, beverage and tobacco listed in South Africa and Australia as water-scarce countries, and comparing to global best practices of firms listed on the DJSI, also limited the population/sample size. Suggestions for future research is that this study can easily be replicated to other industries and countries to substantiate whether IR reporting is associated with improved disclosure.

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### Appendix

| South African companies (JSE) | Australian companies (ASX) | DJSI | Country |
|-------------------------------|----------------------------|------|---------|
| Ah-Vest Ltd                   | Australian Agricultural Company Ltd. | Ajinomoto Co. Inc. | Japan |
| Anheuser-Busch InBev SA       | Bega Cheese Ltd.             | British American Tobacco plc. | UK |
| Rhodes Food Group Holdings Ltd.| Dongfang Modern Agriculture Holding Group Ltd. | Coca-Cola European Partners plc. | UK |
| AVI Ltd                       | Bubs Australia Ltd.          | Coca-Cola HBC AG | Switzerland |
| British American Tobacco plc. | Capilano Honey Ltd.          | Danone S. A. | France |
| Clover Industries Ltd.        | Clean Seas Seafood Ltd.      | Diageo plc. | UK |
| Crookes Brothers Ltd.         | Costa Group Holdings Ltd.    | General Mills Inc. | USA |
| Distell Group Holdings Ltd.   | New Zealand King Salmon Ltd. | Grupo Nutresa S. A. | Colombia |
| Libstar Holdings Ltd.         | Elders Ltd.                  | Hershey Co. | USA |
| Oceana Group Ltd.             | Fonterra Ltd.                | Kellogg Co. | USA |
| Pioneer Foods Group Ltd.      | Freedom Foods Group Ltd.     | Mondelez International | USA |
| Premier Fishing Brands Ltd.   | Huon Aquaculture Group Ltd.  | Nestlé S.A. | Switzerland |
| Quantum Foods Holdings Ltd.   | Inghams Group Ltd.           | Thai Beverage plc. | Thailand |
| Astral Foods Ltd.             | Bellamy’s Australia Ltd.     |                  |        |
| RCL Foods Ltd.                | Select Harvests Ltd.         |                  |        |
| Sea Harvest Group Ltd.        | Tassal Group Ltd.            |                  |        |
| Tiger Brands Ltd.             | The A2 Milk Company Ltd.     |                  |        |
| Tongaat Hulett Ltd.           | Wattle Health Australia Ltd. |                  |        |
|                              | Wellard Ltd.                 |                  |        |
| Total: 18                     | 20                          | 13              | 51 |

(Own compilation)

Table A1. Sampled companies

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