



Assessing the impact of environmental information disclosure on plastic waste management in food and beverage firms

Smangele Nzama ^{1*}, Odunayo M Olarewaju ²

¹ Department of Financial Accounting, Faculty of Accounting and Informatics, Durban University of Technology, Durban, South Africa

² Crown College, St Bonifacius, Minnesota, United States

Abstract

Environmental information disclosure is low in South Africa because there is a lack of strict regulations and policies obligating manufacturing firms to disclose information on their environmental impact. In most cases, these firms report such information willingly to achieve a competitive advantage. This research work aims to evaluate the influence of environmental information disclosure on plastic pollution control in food and beverage manufacturing firms. The study was based on food and beverage manufacturing companies that make use of plastic items in their operations by packaging their manufactured products. A quantitative research approach was used where 128 structured Likert questionnaires were distributed to the participants of the study. A Pearson's correlation coefficient, as well as regression analysis, were carried out. The findings showed a substantial and strong correlation between environmental information disclosure and plastic pollution prevention in food and beverage manufacturing companies at ($r = .729$, $p < 0.0005$). Linear regression analysis showed an R^2 value of 0.542 suggesting that environmental information disclosure accounts for 53.2% of the variance of plastic pollution control at $F(1,122) = 138.751$; $P < 0.0005$. It was concluded that disclosing environmental information can significantly assist management in decision-making to develop sound measures to minimize plastic waste.

Keywords: Environmental Management Accounting; Environment Disclosure; Sustainability; Green operations; Environmental preservation; Plastic Waste

JEL: M41, Q52, Q56

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* Corresponding author. E-mail address: smangelen1@dut.ac.za

1. Introduction

In recent years, environmental issues have become a new area of research worldwide as the economic growth of nations that are developed and those that are still developing is growing rapidly. The negative impact of manufacturing firms on the environment has caught the attention of different stakeholders and they have called for accountability of those responsible. The traditional accounting system had to go through change throughout the years by incorporating environmental operations and reflecting the firm's economic activity and environmental information (Ting, 2017). Environmental information disclosure is a new challenge for accountants and recent research has focused on discussing its role, implementation, and challenges in heavily polluting industries (Elshabasy, 2018). Furthermore, it is useful to top management in decision-making and encourages firms to improve their environmental performance. It encourages firms to develop adequate environmental preservation and business strategies to overcome the challenges posed by environmental issues (Li et al., 2018).

Environmental information disclosure is an important way of communication between firms and external stakeholders since it allows them to understand and evaluate a company's operating circumstances and potential hazards (Zhang et al., 2024). According to Kosajan et al. (2018), environmental information disclosure is a key subfield of government information disclosure as well as an important environmental management tool. Environmental disclosure differs by country, with Sub-Saharan Africa having relatively low levels by international standards. This depends to some extent on the sorts of enterprises operating in various locations and the residents' understanding of environmental risk issues (Dagestani et al., 2022). In 2010, South Africa joined the group, adding the letter S to the name and establishing BRICS. The rise in negative environmental effect by BRICS enterprises has raised concerns about environmental legislation, as well as the existence of certain shared interests. Just as environmental disclosure and sustainability reporting are voluntary in most nations, so are external verification and auditing; in the BRICS, there is no requirement for the development, dissemination, and verification of such reports (Oliveira et al., 2017). Ofoegbu et al. (2018) highlighted that 45% of environmentally sensitive sectors in South Africa have a substantial effect on environmental disclosure. South African firms listed on the JSE are required to disclose their environmental impacts as well as the various techniques used to mitigate them (Nyahuna and Doorasamy, 2022).

Although JSE mandates firms listed to disclose, there is still a lack of implementation of environmental information disclosure as an environmental management tool in firms that are not listed due to a lack of governmental regulation. The destruction of South Africa's natural environment has been linked to an exponential increase in human stress associated with urban living. Investigations have indicated increased environmental deterioration as well as signs of worsening water, soil, and air quality. The state of the environment has raised concerns about the legislative framework that governs communication, interaction, and accountability among communities, government officials, and the private sector (McCarthy, 2016).

Many South African businesses, especially restaurants, have opted to prohibit the use of plastics. Prohibitions on single-use products will benefit the environment, however, it will have some negative consequences for businesses and consumers (Muller, 2019). Because of the growing awareness about the environmental effects, several plastic items are limited or banned (Gionfra, 2018). However, it should be noted that banning single-use plastic only will not resolve this global environmental issue, certain measures need to be put in place at the corporate level. South Africa already has some legal and economic tools in place, such as

a ban and fee on plastic carrier bags, legislation mandating waste facility licensing, and the creation of waste management standards. Other tools, such as (dis)incentives to shift away from problematic and unneeded plastic items and packaging, must be developed to help facilitate the transition to a circular plastics economy (de Kock et al., 2020).

The focal of this study was food and beverage manufacturing firms because these firms in South Africa contribute significant to plastic waste, most of which comes from single-used food and beverage packaging. The food and beverage sector, as a significant user of single-use packaging, plays a vital role in combating plastic pollution; nevertheless, research into this industry's acceptance and transition to sustainable packaging remains sparse. This paper offers insight into how food and beverage manufacturing firms can make use of environmental information disclosure as an environmental management tool to aid management in making sound decisions and developing prevention measures that will minimize their environmental footprint. The contribution of this study is crucial to the literature on sustainable environmental practices policymakers and to food and beverage firms who wish to embark on green operations. The desire for environmentally friendly operations and products and a solution to the mismanagement of plastic waste has grown in popularity and importance. This study will assist policymakers in thoroughly evaluating the potential advantages and costs of various environmental information disclosure programs. Disclosing environmental information might be a better way of controlling plastic pollution by developing measures or alternative options that reduce the consumption and manufacturing of plastics.

2. Literature review and hypothesis development

2.1. Review on environmental information disclosure: Prior research, prospect, and challenges

With the shortcomings of traditional accounting systems that excluded the disclosure of environmental information, firms need to enhance the complexity of environmental information reporting as a major source of reducing pollution. The disclosure of environmental information is a means of summarizing firms' environmental-related operations and providing information on financial statements to different users (Wang et al., 2020). According to Ren et al. (2020), reporting environmental information reduces asymmetric information between a company and its external parties, improving the company's brand image and reputation value, allowing it to acquire more funding sources, lowering its cost of capital, and growing its real worth. Environmental information disclosure, as a new environmental regulation instrument, can successfully stimulate regulated enterprises to manage the interaction between earnings and social duties of energy conservation and reducing emissions (Feng et al., 2021b; Liu and Anbumozhi, 2009).

Environmental accounting requires a company to disclose any polluting processes and to keep track and report on the usage of ecological services. It is expected that such operations have a major impact on the assets and profitability of the firm (Noodezh and Moghimi, 2015). Reporting information concerning the environment can play a significant role in promoting sustainable corporate accountability as an environmental management technique for communicating with investors, the government, the public, and other stakeholders (Liu and Anbumozhi, 2009). Zeng et al. (2010) described the disclosure of environmental information as a manner of reporting information on the organization's activities associated with the environment, protecting it, and using natural resources. It is further stated that governments around the world are embracing this approach as it

significantly influences the firm's behaviour and, in most cases, reduces pollution levels. Lin et al. (2021) stated that the availability of environmental information will assist the government and the general public in better monitoring and enforcing firms that are concerned about environmental sustainability.

Different stakeholders are dissatisfied with how firms' operations negatively impact the environment and the extent to which they participate in environmental safety and damage prevention initiatives. Many firms have responded to stakeholder pressure by willingly publishing environmental data in annual financial statements or various sustainability reports (Hassan and Ibrahim, 2012). According to Li et al. (2018), environmental information disclosure is useful to the environmental safety department because they can utilize such information to understand the general environmental conditions and provide an accurate assessment of the company's ecological responsibility. Environmental information includes monetary, sustainability practices, and policy factors that are scattered throughout social responsibility reports and yearly statements of an organization (Liu and Anbumozhi, 2009).

Prior research by Zeng et al. (2012), highlighted the importance of heavily polluting industries to disclose their environmental information as this not only helps management in decision-making but also improves their public image. Despite that, there are still inadequate levels of disclosure efforts for firms due to a shortage of third-party audits, and inadequate enforcement of information disclosure requirements (Fan et al., 2020). Huang and Kung (2010) findings revealed that the expectations of stakeholder groups have a considerable impact on the extent of environmental disclosure. The external stakeholders (the government) have a significant impact on managerial objectives on the level of environmental disclosure, internal stakeholders (employees or shareholders) put additional pressure on businesses to provide environmental information. Based on the review by Qing (2022) firms operating in cities with rigorous environmental disclosure laws report to have environmental conditions that are healthy and clean.

According to Wan and Yu (2024), environmental information disclosure (EID) has contributed to not only the contamination of urban environments through the primary system of minimizing disparities in information among subjects and bolstering the multi-accountability system but also through the intermediary system of government control and environmentally conscious production substitutes. Environmental information disclosure has been shown to have a significant pollution emission reduction effect through fostering industrial framework transformation, emission reduction technology progress, minimizing FDI, and boosting firms' overall efficiency factors (Lou and Zhu, 2024). Ren et al. (2020) findings revealed that environmental information disclosure has an impact on a company's green and financial performance by raising environmental management tasks and expenditures.

Large organizations are likely to report environmental information and heavily polluting industries such as papermaking and printing, metal, non-metal mining, and food and drink (Zeng et al., 2010). Enterprises, particularly those in heavily polluting sectors, are the primary sources of pollution and have to acknowledge environmental responsibility (Lin et al., 2021). Chen et al. (2020) determined that listed industrial enterprises in China continue to engage in EID on an obligatory basis. The EID of high-polluting firms is much greater than that of non-polluting enterprises. A study conducted by Ren et al. (2024) reveals that third-party EID has a greater impact on lowering companies' carbon emissions in places with higher levels of public environmental concern, government environmental legislation, and internet development.

Lin et al. (2021) findings indicated that an increase in the disclosure of the environmental information of the selected companies does not automatically mean air pollution will decrease. Feng et al. (2021a) findings

suggested that air pollution can stifle economic progress and that funding for scientific research and polluter financing are two important transmission routes. In opposition to Lin et al. (2021), Feng et al. (2021a) study revealed that environmental information disclosure significantly minimizes pollution concealment and failure to disclose, allowing the government's environmental reports to more properly reflect air quality. Thus, results obtained by Shi et al. (2021) confirmed and indicated that EID has a considerable emission reduction effect on enterprises, which improves their environmental performance and demonstrates EID's usefulness in company pollution management.

Huang and Chen (2015) highlighted that in China conventional management and control and market-based mechanisms continue to be important pollution-control methods. Environmental information disclosure had only a minor impact on the emission of the "three industrial wastes". According to the findings of Jeroh (2020), the disclosure of adverse environmental impact failure by South African firms may not be solely due to internal variables such as governance features. Therefore, external variables, such as statutory regulations requiring South African firms to prepare and provide their separate sustainability reports, may predetermine their degree of engagement with environmental disclosure in South Africa. Nyahuna and Doorasamy (2022) found a significant negative relationship between air pollution and organizational environmental information disclosure in the South African northern province. Furthermore, the overall class of environmental information disclosure in heavily polluting enterprises remains quite low. It is argued that the South African government may prioritize economic expansion rather than environmental conservation.

2.2. Review on plastic pollution: An environmental problem and pervasive practice of ecological degradation in South Africa.

Plastics have been identified as one of the top pollutants among the many pollutants discarded in land-based and marine environments. Plastic is both cost-effective and adaptable because of these benefits there has been growth in the consumption of many plastic items. Despite their many significant benefits, plastics take a long time to deteriorate in the environment (Rajmohan et al., 2019). Modern society's irresponsible usage of non-biodegradable plastic items causes plastic pollution, harming different industries, biodiversity, and human health. Present clean-up efforts have sought to alleviate the detrimental consequences of plastic waste; however, they have been unable to cope with the rising amounts of plastic waste contaminating the environment. Thus, minimizing plastic emissions should be an international goal that is prioritized by companies, governments, and policymakers (Prata et al., 2019). According to Mihai et al. (2021), poor waste management is a dominant contributor to plastic pollution found in the environment that needs to be minimized by implementing measures that improve the life cycle of plastics, particularly in manufacturing, usage, and plastic discarding methods. Figure 1 shows plastic item cycle in a manufacturing firm.

Population and economic growth, climate, and social behaviour all have a significant impact on plastic garbage. Among these elements, social behaviour is the most important component that contributes to the development of plastic garbage since humans utilize plastic in their daily lives (Kedzierski et al., 2020). Previous research found that a positive attitude is largely dependent on environmental knowledge, which results in positive action toward nature. Gender also had an impact on behaviour when it came to lowering plastic consumption (Hasan et al., 2015). Disposable plastic food packaging contributes significantly to the worldwide solid waste challenge. While the food industry is working to eliminate disposable plastic packaging, it needs to properly assess customer awareness levels about the problem (Walker et al., 2021).



Figure 1. Plastics item cycle in a manufacturing firm.

Consumer awareness has gained relevance in the field of sustainability in recent years, most notably in terms of how sustainability communication impacts customers' impressions of firms and purchase behaviour of products (Rhein and Schmid, 2020). According to Khan et al. (2020), influencing consumer behaviour to reduce plastic usage will have an impact on their recycling behaviour. Furthermore, environmentally conscious behaviour has been given different titles, such as eco-friendly behaviour, socially responsible behaviour, and so on, while consumers who exhibit this behaviour have been classified as green consumers, socially conscious consumers, and so on. There is mounting proof that customers are selecting or avoiding items based on their influence on the environment (Hameed et al., 2021). de Sousa (2023) highlighted that the understanding and awareness of the consumer on the issue of plastic waste can play a significant role in fixing the problem. Researchers concur that a thorough grasp of consumers' understanding of plastic and its negative effects is essential for corporations and governments to execute effective plastic initiatives.

It is noted in a study by Hahladakis et al. (2020) that recycling is a popular way of reducing plastic waste. However, the present garbage and recycling facilities are currently unable to keep up with the increasing amount of end-of-life plastic (Rhein and Schmid, 2020). According to Rajmohan et al. (2019), reduce, reuse, and recycle are crucial concepts for pollution prevention and mitigation, and this situation applies to plastics as well. Moreover, reusing plastics is preferable to recycling since it produces less pollution and is less hazardous. The recycling process of plastic involves reusing scrap or rubbish plastic and converting it into usable commodities. As a result of the composition of the recovered waste fraction, plastics can be recycled multiple times while preserving their worth and functional qualities (Milios et al., 2018). Plastic waste recycling is a sustainable solution to managing the issue of the disposal of plastic waste that has now become a manufacturing standard practice (Gu et al., 2017). According to Satapathy (2017) recycling plastic products keeps them out of landfills and allows plastics to be utilized in the manufacture of new products.

2.3. Conceptual Framework to show the linkage between the variables

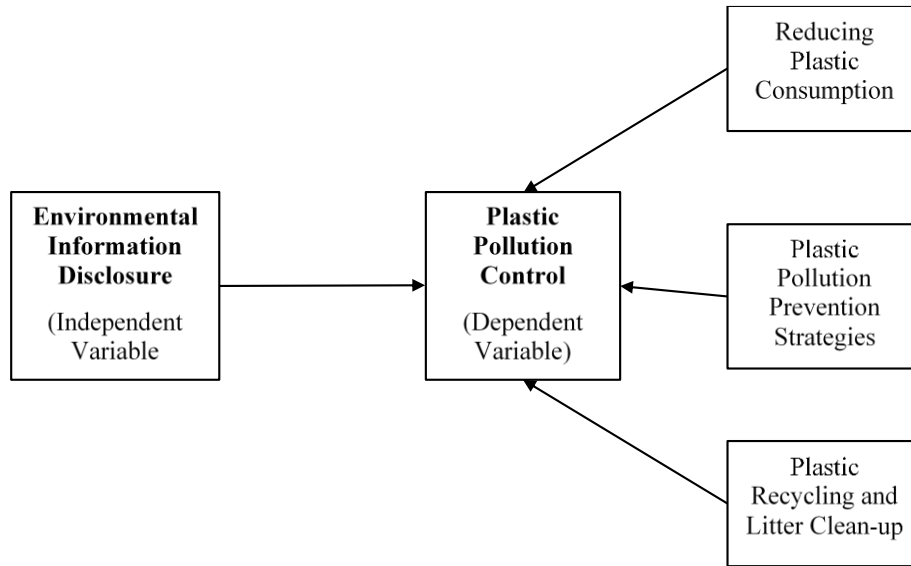


Figure 2. Conceptual framework

2.4. Theoretical framework: Legitimacy theory

One of the most commonly referenced theories on the subject of social and ecological accounting is legitimacy theory. Hence, this study employs legitimacy theory to determine other factors for environmental information disclosure as an environmental management tool to resolve the issue of plastic pollution. This theory is a technique that helps companies embrace and build voluntary social and environmental information disclosures to fulfil their social contract, allowing for the acknowledgment of their goals and viability in a turbulent and uncertain environment (Burlea and Popa, 2013). Moreover, Michelon et al. (2016) highlighted that legitimacy theory defines companies as social beings whose existence is dependent on the willingness of the public to support them. It further provides a compelling technique for assessing firms' voluntary social and environmental information disclosures, as well as a mechanism for engaging in critical public debate (Tilling, 2004; Crossley et al., 2021). Ogunode (2022) emphasized that this theory examines the consistency between the cultural beliefs of the community and the company. However, it does not guide how to build cohesion or formulate a strategy.

The legitimacy theory assists in evaluating an institution's behaviour when it comes to adopting, creating, and conveying social responsibility policies. The main assumption of legitimacy theory is that the social compact of the institution has been satisfied, allowing its aims to be recognized (Zyznarska-Dworczak, 2018). The idea of corporate legitimacy serves as the cornerstone of legitimacy theory. This theory forces the firms to be accountable for their environmental footprint and consider the interests of society. Hence, firms seek to operate in accordance with the ethics and expectations of their surrounding communities (Ofoegbu et al., 2018). According to this theory, firms can utilize corporate social and environmental disclosure (CSED) as a

technique to transmit information about business practices and operations to fulfill the needs of the community and maintain their authorization to function in society (Ofoegbu and Megbuluba, 2016). CSED considers both the social and environmental elements of corporate success. Thus, CSED covers the transmission of information regarding their human resource practices, community participation activities, and initiatives, product and service quality and safety, and environmental impact (Enekwe et al., 2023).

According to Gandolph et al. (2021), legitimacy theory encompasses the degree and types of corporate social disclosure in annual reports, which are closely related to management's assessments of community questions about safety. A variety of environmental reporting and performance studies use legitimacy theory as an interpretative lens. Legitimacy theory is used to explain business behaviours to threats to their legitimacy in relation to the social contract (Mobus, 2005, Deegan, 2019). Akhter et al. (2023) stated that legitimacy theory is an explanatory factor for environmental disclosures. In terms of legitimacy, businesses in the high-impact industry sector are required to pay more attention and importance to environmental information disclosure than businesses in the medium and low-effect industries (Behram, 2015). Overall, A firm is deemed legitimate and considered a good corporate citizen if it delivers advantages to society and demonstrates how valuable it is to society (Sufian et al., 2020).

Based on the review of the literature, there is a lack of thorough investigation of the influence of environmental information and plastic pollution control, hence the need to carry out the study. Several authors have stated that if the issue of plastic pollution is not addressed effectively, the world will be covered with plastic by 2050 (Gross, 2017, Wilcox et al., 2015, Kaza et al., 2018, Floyd, 2016). This paper sought to fill the gap in existing studies and add to the body of knowledge.

Figure 2 shows a framework that represents the expected cause-effect relationship between your environmental information disclosure (independent variable) and plastic pollution control (dependent variable). Thus, the hypothesis of the study is:

- *H0*: Environmental information disclosure does not influence plastic pollution control in food and beverage manufacturing firms in Durban, South Africa.
- *H1*: Environmental information disclosure influences plastic pollution control in food and beverage manufacturing firms in Durban, South Africa.

3. Methods

This research work follows a positivist research paradigm. Hence, the quantitative approach is used in this study. According to Park et al. (2020), by constructing functional linkages between causative and explanatory elements (independent variables) and outcomes (dependent variables), positivism applies the hypotheticodeductive technique to evaluate a priori ideas, which are usually stated numerically. Positivistic philosophers employ scientific methodologies to standardize the knowledge generation process and increase the simplicity of parameter descriptions and their linkages (Antwi and Hamza, 2015). Quantitative research is concerned with statistical presentation, whereas qualitative research is concerned with understanding the given problem. Quantitative research involves regular methods and formal instruments for data collection. The data is collected objectively and thoroughly. In order to analyze numerical data statistical methods such as SPSS, R, OR Stata (Queirós et al., 2017). Therefore, in this research work, a quantitative research approach was utilized.

Food and beverage production companies that operated in Durban were the focal point of this investigation. This sector was focused on because, in their business operation, they mostly use plastic as a form of packaging their products. Thus, when their products have fulfilled their intended purpose, the plastic package is disposed of and pollutes the environment. Such products include meals, cool drinks, water, etc. It is estimated that approximately 55 companies manufacture food and beverages in the Durban area (Robbins and Velia, 2015, Nzama et al., 2022). Since the population is small, the researcher anticipated to study the entire population, however, due to the limitation during the fieldwork phase which was during covid times with strict regulation, only companies that were willing to participate in the study were used. The sampling technique utilized was a non-probability sampling called convenience sampling and only 32 food and beverages made up the sample of the study. This sampling method was chosen because the researcher had to use companies that were willing to engage in the study in order to achieve the study objectives. Etikan et al. (2016) confirmed that this method is useful in cases where the researcher wants easy access to the respondents, accessibility at a certain moment, or desire to take part in the study. However, it is possible that this sample may not reflect the general population. Studies on convenience samples are limited to generalizing to the population that was easily accessible at the time the sample was drawn (Andrade, 2021). In this study, the implication of using convenience sampling was that the sample size may not be typical a representation of all food and beverage firms in Durban, South Africa.

The sample size for this study was 32 enterprises that make food and drinks multiplied by the four chosen respondents, which included finance supervisors, managerial accountants, production accountants, and senior accountants. Henceforward, the sample size of this study is 128 respondents from the selected manufacturing firms in Durban as illustrated in Table 1. The sample size of manufacturing businesses provided the researcher with sufficient data to carry out the study and meet its aims. The participants were the responders who were asked to complete the surveys and were chosen based on the nature of their jobs. The selected participants perform similar tasks in the organization and work collaboratively. Their primary function is to generate financial accounts, forecasts, and economic activity reports.

Table 1. Target population and sample size

Respondent Category	Number in each Selected firm
financial managers	1
management accountants	1
factory accountants	1
chief accountants	1
Total	4
Total questionnaire to be distributed = $32 \times 4 = 128$	

Data was collected using the popular method of gathering primary data, which was a questionnaire survey. Mazhar et al. (2021) highlighted that data that has not yet been published is more reliable, precise, and impartial. Because this data has not been edited or updated by humans, it is more reliable than secondary material released by another source. In this study, 128 closed-ended structured questionnaires were mailed

to selected food and beverage-producing firms in Durban. The questionnaire surveys enabled the researcher to collect precise data from a specific set of people about their preferences, opinions, behavior, or factual information. Closed questions are thought to produce quantitative data that is easier to numerically code and statistically analyze (Young, 2015). Closed-ended questions are ideal for postal and online surveys because they produce standardized replies, require minimal time to fill out, and are quicker to evaluate (Story and Tait, 2019). According to Ball (2019), respondents like to answer survey surveys online because they may do it at their leisure and their own pace, potentially increasing response rates.

The researcher approached respondents via email and briefed them on the study's topic. The survey participant's email address was retrieved from their website, and each potential participant selected was emailed an invitation to participate. The surveys are written in English and are followed by a permission template that summarizes and gives the responder a quick introduction to the questions and research. Participants were issued an email reminder two weeks following the first circulation of the questionnaires. The quantitative portion was based on data from five closed-ended Likert scale questionnaires. The Likert scale is ranked as follows: (1) Strongly disagree; (2) Disagree; (3) Neutral; (4) Agree; (5) Strongly agree. As the questionnaires were self-administered, participants were required to read through and respond to the surveys on their initiative. The questions focused on EMA practices as an environmental management tool, environmental costs, and environmental information. The questionnaires were structured as follows:

- *SECTION A:* Demographic information (Occupation, years of experience, qualification level, firm size, environmental activities, and costs).
- *SECTION B:* Environmental Management Accounting Practices (EMAPs) in a firm (include questions about the implementation of such practices as a corporate environmental strategy, firm environmental-related activities, their perspective of EMAPs, and factors influencing the adoption of EMAPs).
- *SECTION C:* Plastic pollution control (questions relating to the level of plastic waste measures within the firm and barriers to adopting other sustainable forms of packaging that are environmentally friendly).
- *SECTION D:* Environmental Management Accounting practices on plastic pollution control (questions relating to environmental information disclosure and environmental costs associated with plastic pollution).

The process of data collection involved obtaining the email addresses of the respondents via the company website and inviting them to complete the survey. This approach was useful as the study was carried out during the covid outbreak and the country was on lockdown. Thus, the targeted respondents were often busy due to the nature of their work. Prior to administering the questionnaire, pre-testing and a pilot study were conducted to examine the questions in the surveys. Three academics from the DUT Management Accounting department who specialize in Environmental Accounting pretested the questions. The pilot was conducted with 12 participants who were not part of the study's sample. These processes were in place to guarantee that the questionnaires were error-free and that the questions were straightforward, and could be easily understood by the participants. Content validity was utilized to assess the study's correctness. The questionnaires addressed all of the pertinent characteristics that the study sought to quantify. This was discovered after completing a preliminary study. To ensure the respondent's reliability, internal consistency will be used to measure reliability by grouping questions in a questionnaire that evaluates the same concept. All components

examined had Cronbach's alpha coefficients of 0.05 or above, indicating moderate (acceptable) reliability (Kennedy, 2022).

Overall, 128 questionnaires were distributed to the respondents. However, when the surveys were returned, four (4) were filled incorrectly. With a response rate of 96.8%, the study obtained 124 valid responses. Responses from survey questions were gathered and analysed using the Statistical Package for the Social Sciences (SPSS). The ordinal data was ranked from one (strongly disagree) to five (strongly agree). Nominal data was represented as (1) "Yes" or (2) "No." SPSS was used to conduct both descriptive and inferential statistical analyses. Descriptive statistical analysis visualized demographic data distributions with charts. While, inferential statistical analysis was utilized for correlation analysis, regression analysis, and hypothesis testing.

4. Results

The current study focused on association testing; hence, the data were analyzed quantitatively to determine the hypothesis. Data was collected via questionnaire responses and analyzed using SPSS (descriptive and inferential statistical analyses).

4.1. Descriptive analysis

Descriptive statistics are used to summarize data in an organized manner by describing the relationship between variables in a sample or population. The demographic details of the survey questionnaire were analyzed using pie charts, a type of descriptive analysis. Six categories of demographic information were elicited from the survey respondents as shown below.

4.1.1. Job designation

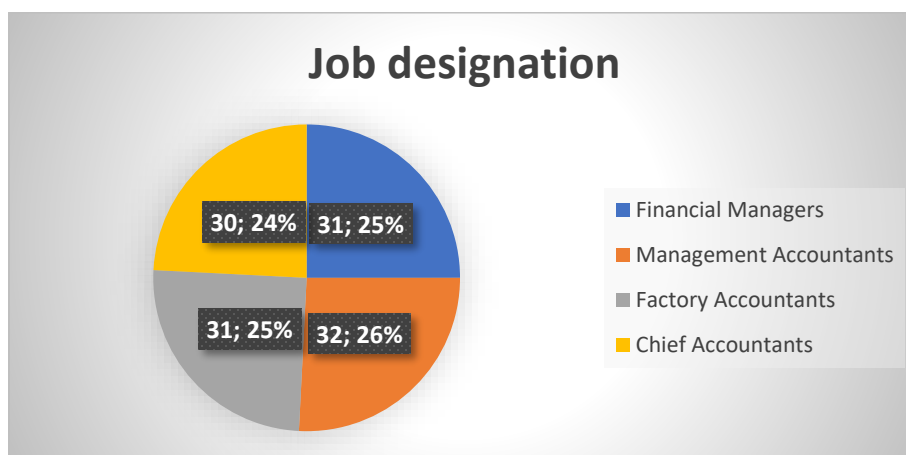


Figure 3. Job designation

The survey respondents were asked to indicate their Job Designation. The analysis showcased that 31 (25%) were financial managers, 32 (25.8%) were Management accountants, 31 (25%) were Factory accountants, and 30 (24.2) were Chief accountants. The respondent's Job designation is indicated in Figure 3.

4.1.2. Employment experience

Employment experience reveals the number of years of experience of the respondents. On the employment experience of the respondents, the analyzed data revealed that 11(8.9%) 0-5 years, 25(20.2%) 6-10 years, 36(29%) 11-15 years, 36(29%) 16-20 years, while 16(12.9%) greater than 21 years. The result indicated that over 70% of respondents had more than 10 years of work experience. The respondent’s employment experience is indicated in Figure 4.

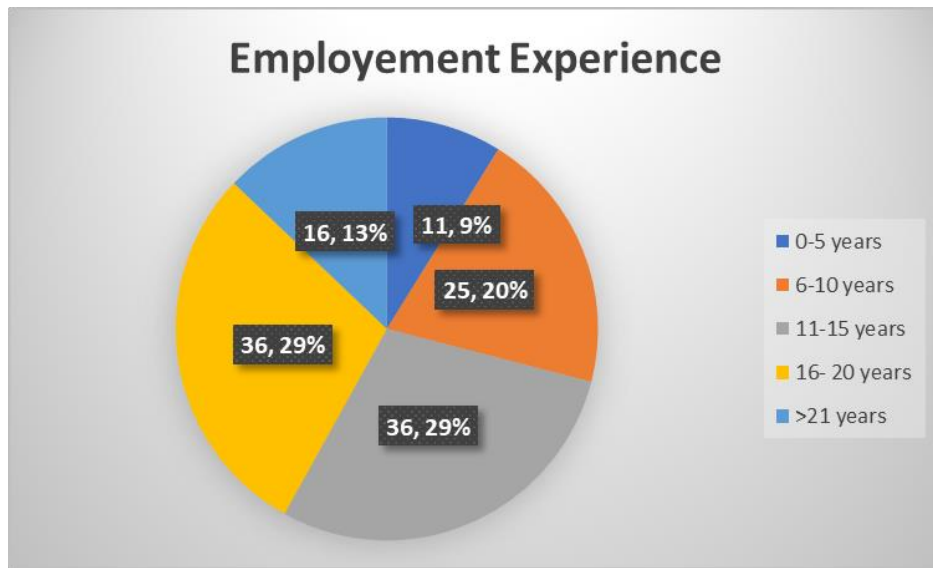


Figure 4. Employment experience

4.1.3. Qualification

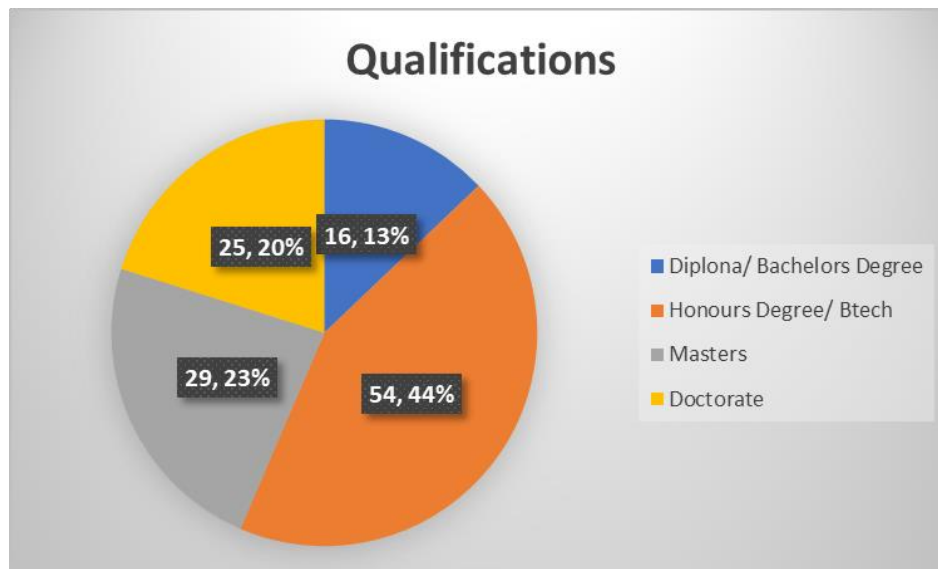


Figure 5. Qualifications

On the level of qualification of the survey respondents, the analyzed data revealed that 16(12.9%) hold a Diploma/ bachelor’s degree, 54(43.5%) Honour’s degree/Btech, 29(23.4%) Master’s degree while 25(20.2%) holds a doctorate. The respondent’s qualifications are indicated in Figure 5.

4.1.4. Firm scale

In the survey, respondents were required to specify their firm scale. The studied data indicated that 57 (46%) were small, 39 (31.5%) were medium, and 28 (22.6%) were large. The respondent’s Firm Scale is indicated in Figure 6.

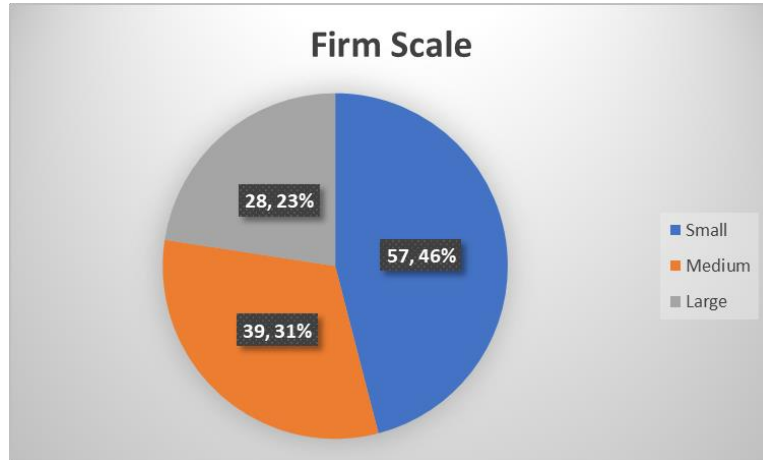


Figure 6. Firm scale

4.1.5. Environmental costs

Participants in the survey were required to indicate their environmental costs. The analyzed data revealed that 87 (70.2%) indicated Yes, while 37 (29.8%) indicated no. The respondent’s environmental costs are indicated in Figure 7.

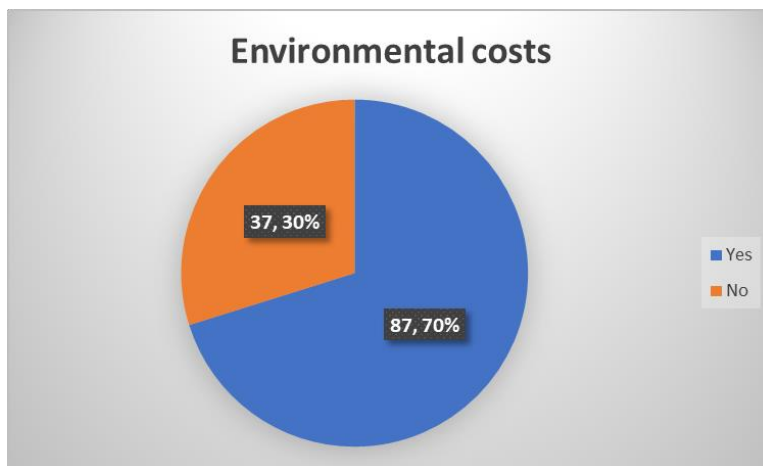


Figure 7. Environmental costs

4.1.6. Environmental Activities

The survey respondents were asked to indicate their investment in environmental activities. The analyzed data revealed that 84 (67.7%) of the respondents suggested that they invested in environmental activities while 40 (32.3%) indicated that they had no investment in environmental activities. The respondent’s Environmental Activities are indicated in Figure 8.

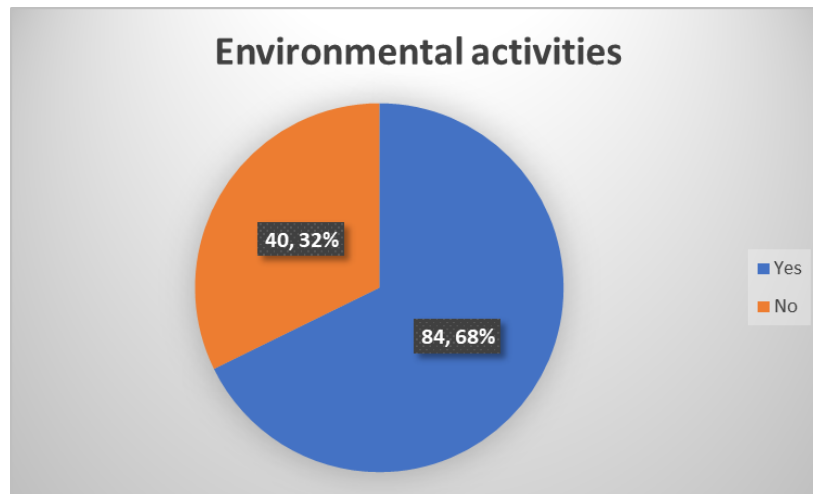


Figure 8. Environmental activities

4.2. Exploratory Factor Analysis (EFA)

In general, factor analysis is utilized to determine the fundamental connections and framework for a set of observable variables. Factor analysis comes in two varieties: exploratory factor analysis (EFA) and confirmatory factor analysis (CFA). EFA permits observable (measured) variables to be connected with any latent factors, whereas CFA restricts which variables load onto which factors (Luo et al., 2019). Exploratory factor analysis (EFA) is a multimodal statistical approach with the goal of identifying the lowest possible number of speculative structures that may effectively represent interaction seen among a set of measured variables (Watkins, 2018).

Table 2. Cronbach's alpha coefficients (Reliability and Validity)

Items	Item factor loadings	
	1	2
ERA_1	0.730	
ERA_2	0.852	
ERA_3	0.792	

ERA_4	0.821	
ERA_5	0.806	
INF_1	0.691	
INF_3	0.743	
INF_4	0.800	
INF_5	0.806	
INF_6	0.800	
INF_7	0.629	
PEM_2	0.564	
PEM_3	0.751	
PEM_4	0.734	
PPC_2	0.505	
PPC_7	0.588	
PPC_8	0.740	
EMA_9	0.520	
EMA_10	0.555	
INF_2		0.599
INF_8		0.667
INF_9		0.681
PPC_1		0.624
PPC_3		0.572
PPC_4		0.500
PPC_6		0.566
ERA_6		0.567
Cronbach's @	0.925	0.869
Eigen value	14.952	3.548
Variance	28.212	6.694

$KMO = 0.774$; $\chi^2 = 5449.334$; $df = 1378$; $P < 0.001$

The illustration in Table 2 represents items retained for the two factors. Overall, the Cronbach's alpha coefficient for all factors is greater than 0.70. Bujang et al. (2018), outline Cronbach's alpha as the internal coherence or reliability of a group of elements, data collection, or evaluations. It assesses the dependability of questionnaire responses, instruments, or rankings assessed by respondents, indicating the method's stability. The value of Cronbach's Alpha is usually expressed as a number between 0 and 1 with an acceptable range between 0.70 to 0.90 or higher (Adeniran, 2019). The Eigenvalue factor one which measures environmental information disclosure is 14.952 which explains 28.2% of the variance. The second factor which measures plastic pollution control has an Eigenvalue of 3.548 with a variance explained by 6.7%.

The KMO test result of 0.77 indicates that the study sample size of 124 is sufficient. The Bartlett test of sphericity which explains why EFA was carried out is statistically significant at $P < 0,001$.

4.3. Analysis of Pearson's correlation coefficient and linear regression.

To establish a link between environmental information disclosure and plastic pollution control in food and beverage production enterprises, Pearson's correlation coefficient was employed. The outcome of the statistical analysis is presented in Table 3.

Table 3. Correlation between environmental information disclosure and plastic pollution control

Construct A	Construct B	Pearson's correlation (r)	p-value
Environmental Information Disclosure	Plastic Pollution Control	.729**	<.0005

** Correlation is significant at the 0.01 level (2-tailed)

Table 3 shows the Pearson's correlation coefficient outcome, which shows a statistically significant association between environmental information disclosure and plastic pollution prevention in food and beverage production enterprises at ($r = .729, p < 0.0005$). Correlation coefficients are scaled from -1 to +1, with 0 indicating no monotonic correlation and the relationship increasing as the coefficient approaches the absolute value of 1 (Schober et al., 2018). Therefore, the R-value of 0.729 suggests a strong and direct relationship between environmental information disclosure and plastic pollution control. The relationship's significance is stated in probability levels (P value). The value of P indicates how improbable a certain correlation coefficient R is to occur assuming that no association exists in the population. It should be emphasized that the higher the correlation R, the stronger the association, but a lower P-level implies a more meaningful relationship (Obilor and Amadi, 2018). As the P-value is less than 0.0005, this indicates a significant relationship between the variables of the study. The result shows a positive correlation which indicates a direct relationship between the two constructs. When construct A grows, construct B grows in a defined proportion. In practice, this implies that as environmental information disclosure improves, so will plastic pollution reduction. In view of the above-mentioned, the hypotheses were accepted.

The level of influence between the two constructs was then determined using a regression analysis. A Pearson correlation analysis assumes that both variables are regularly distributed. As opposed to linear

regression, the values of the independent variable (x) are treated as known constants (Schober et al., 2018). Table 4 shows the outcome of the linear regression.

Table 4. Linear regression

Variables in the equation	B	Beta	t	p-value	R2	F	df	p-value
Constant	7.834		4.847	<.0005	.532	138.751	1; 122	<.0005
Environmental information disclosure	.340	.729	11.779	<.0005				

Dependent Variable (DV) – Plastic pollution control

Independent Variable (IV) – Environmental information

The results of regression analysis summarized in Table 4. indicate R2 value of 0.532 which suggests that environmental information disclosure reports for 53.2% of the variance in plastic pollution control. The R2 outcome informs us the amount of the entire variance in the dependent variable (plastic pollution reduction) can be clarified through the independent variable (environmental information disclosure). The prediction accuracy improves as the coefficient value approaches 1 (Baždarić et al., 2021). In this case, a substantial linear relationship between environmental information disclosure and plastic pollution control was discovered, $F(1,122) = 138.751$; significance levels $P < 0.0005$. $P < 0.0005$ is less than 0.05 and indicates that environmental information disclosure (independent variable) significantly predicts plastic pollution control (dependent variable), $B = 0.729$, $P < 0.0005$.

5. Discussion

This study assesses how environmental information disclosure as an environmental management tool can influence the development of plastic pollution controls in food and beverage manufacturing firms. Using the Pearson correlation coefficient and linear regression analysis, a significant and strong relationship was identified between environmental information disclosure and plastic pollution control, therefore, the hypothesis of the study was confirmed H1. The literature that is similar to this topic is limited, however, Kosajan et al. (2018) emphasized the importance of environmental information as an environmental management tool. Furthermore, it could have a considerable positive influence on protecting society's right to be notified, participate in, supervise, and improve the quality of environmental management in developing nations. The findings of this research work are consistent with prior research, Feng et al. (2021a) found environmental information disclosure played a huge role in reducing the company's avoidance of or failure to report pollution. Ji (2017) findings were also similar to the study as they revealed environmental reporting as critical since it may successfully reduce energy consumption and pollution while also promoting the development of the cause to protect the environment. He et al. (2023) found that reporting environmental

information can reduce carbon emissions this aligned with the results of this study in terms of environmental information disclosure influencing plastic pollution control.

Although these studies were on environmental information disclosure and other types of pollution, their findings on environmental information contributing to the reduction of pollution indicated alignment and consistency. In relation, Pan and Fan (2021) revealed that, in terms of average treatment impacts, the EID-PITI greatly promotes water pollution control. Furthermore, their study showed that EID-PITI enhances water pollution control. The empirical findings of Yang et al. (2022) revealed that environmental information disclosures have the potential to reduce pollutant emissions significantly. Shi et al. (2021) revealed that EID has a considerable emission reduction effect on industrial enterprises, which persists following a series of robustness assessments. According to the heterogeneity study, EID reduces pollutant emissions more effectively for private enterprises, large-scale firms, and firms in the western area. Xiong et al. (2023) findings indicate that environmental disclosure minimizes air pollution by increasing public attention to the environment, innovative green technology, and industry modernization.

Many businesses publish environmental or sustainable development reports to ensure that all stakeholders have accurate information about the company's efforts to reduce its environmental impact (Istrate et al., 2017). According to Tian et al. (2016), reduced contaminant levels and more pollution-control efforts are connected with improved environmental disclosure effectiveness. The impact of environmental disclosure in pollution control has been proven to be reinforced by pressure from the public for a cleaner environment. Environmental information reporting improves awareness and creates a sense that pollution discharge should be monitored and regulated (Tian et al., 2016, Stephan, 2002).

6. Conclusion

As the severity of environmental concerns grows, more stakeholders are worried about the environmental impact of company operations and the extent to which the company has complied with sustainability practices. This study aimed to investigate the impact of environmental information disclosure on plastic pollution control in companies that manufacture food and beverages. Overall, the goal was to see if publishing environmental information assists in developing measures that may reduce plastic pollution.

A Pearson's correlation coefficient and regression analysis were conducted on the data obtained from the respondents. The results obtained from Pearson's correlation coefficient yield a strong and positive relationship between environmental information disclosure and plastic pollution control. A further linear regression analysis performed showed that environmental information disclosure (IV) accounts for 53.2% of the variance in plastic pollution control (DV). According to these findings, environmental knowledge has a large and favorable impact on plastic pollution control. Thus, environmental information significantly predicts plastic pollution control. While the government takes proper actions to promote environmental sustainability, businesses must likewise recognize their negative environmental impact. This can be accomplished by introducing EMA standards and mandating that all food and beverage firms publish environmental information. The government should compel companies to include environmental information disclosure in their policies.

The current research underlined the importance of environmental information disclosure, increased our understanding of how environmental information disclosure affects plastic pollution control, and provided

polymakers and managers with practical consequences. Based on these findings, it can be concluded that when the disclosure of environmental information improves, plastic pollution control within the firm will improve. Specifically, if companies report their environmental information this can assist in developing a measure that will control plastic pollution. Reporting environmental information could lead to better measures to minimize plastic pollution. If managers wish to better control plastic pollution, they must recognize the need to publish more environmental information.

This research paper focused on Durban's food and beverage manufacturing companies. The study's conclusions could not be generalized to the full South African food and beverage manufacturing sector as the researcher used only a convenience sample of firms in Durban. There is a scarcity of literature on environmental information disclosure, particularly in relation to plastic pollution mitigation in South Africa as a whole. Given the relevance and rising interest in sustainable practices, this study advises that environmental management techniques be integrated into firm policies and processes at the strategic level. The government must also play a role in regulating and supporting environmental management practices, such as limiting the consumption of single-use items by food and beverage companies and offering incentives to those that utilize ecologically friendly packaging materials.

This study's research approach was insufficient to provide knowledge or understanding of the extent to which food and beverage manufacturing enterprises have embraced reporting environmental information and EMA procedures. There is a need to expand the research to other South African provinces in order to make a precise comparison of environmental information disclosure for plastic waste management across South Africa, with an emphasis on the food and beverage industry sector. Further study on the same phenomenon, employing a mixed approach, is advised. Finally, the research should be expanded to the plastics manufacturing business.

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