

Benha University   
Faculty of Commerce

Accounting Department

**The Impact of Accounting Disclosure of Sustainable Development Practices on Rationalizing Investment Decision**

**Experimental Study**

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**Abstract**

The purpose of this research is to show the impact of accounting disclosure for sustainable development on rationalizing investors’ decisions. To achieve this purpose, The experimental study was carried out through a questionnaire distributed in three categories (universities teaching staff in some Egyptian universities – accountants and auditors in some accounting and auditing offices – investors and financial analysts in some listed companies). And the study concluded that accounting disclosure about sustainable development practices achieves many internal and external advantages that may reflect positively on the value of the entity, strengthen its reputation, and works to attract investors to it. And it has an important role on rationalizing investors' decisions, as it provides sufficient and appropriate information about the economic, social, and environmental aspects of the company that helps investors study, analyze and evaluate the available investment alternatives. The experimental study indicates that there is a statistically significant relationship between the accounting disclosure of sustainable development practices and the rationalization of investment decisions. Based on that, the study recommends the need for companies to make more accounting disclosures about sustainable development practices and prepare sustainability reports as separate reports in which they disclose financial and non-financial information. And the necessity of issuing an accounting standard for sustainable development that includes defining the intellectual framework for accounting for sustainable development and how to measure, report and disclose it.

**Keywords:** (Sustainable development practices - Sustainable development reports - Rationalizing investment decisions).

# 1. Introduction

Financial statements and reports of the firms are a key tool for the investors, other users and stakeholders to make various decisions. In the wake of the rapid change in the business environment, there has been an agreement that these reports do not adequately reflect the multiple dimensions of the value of the organization at present.

Due to the developments, the world has witnessed on economic, social and technological levels, the emergence of new but unclear relations between the entities, and the increased interest in social responsibility, the institution's responsibility is no longer limited to providing goods and services or achieving the maximum economic return for their owners. (Mansur and Ali, 2019)

Thus, there was an urgent need for disclosing non-financial information such as sustainability, corporate governance, risk management, and the institution's role in achieving environmental and social goals; such issues that are not covered by the statements and their appendices of the financial reports. (Elhag, 2017)

The recent financial collapses in many developed countries endured have ignited specialists to think of measures to protect investors from committing mistakes when managing the economic units resulting from the accounting information issued by those units which lack the characteristics of the quality of the accounting information. That is why accounting information is one of the basic elements that the investor depends on when making investment decisions in economic units. (Ali and Abdullah, 2018)

Accounting information is the mean by which companies provide their financial position, performance, and cash and non-cash expenditures. Financial reports are also the technical means used to deliver accounting information, which must be appropriate and well-prepared, characterized by appropriate, reliable and sufficient credibility to be suitable when making good decisions. (Wali and Ali, 2013)

Despite the great importance of the financial reports of managers, investors, shareholders and creditors, one of the weaknesses of the reports is that they lack information on matters of great importance at present related to the social and environmental dimensions of the company's activities.

Many companies face criticism for their social and environmental impacts despite achieving financial or technological progress. As a result of interest in environmental and social issues, pressure has increased on companies to increase disclosure of related activities, and some countries have even set out mandatory rules for disclosing these activities related to sustainable development. (Xiao et al., 2005)

Disclosure of the published financial statements and reports represents the minimum amount of information as it focuses only on financial information. Hence, there is a need to expand the scope of comprehensive disclosure of social and environmental responsibility in addition to the economic responsibility of businesses to provide appropriate information content for Environmental, social and economic practices of interest to users of this information as investors and decision-makers. (Oluwagbemiga, 2014)

The conventional accounting disclosure methods are affected by the delay in preparing financial reports and delivering them to users, as well as lacking useful information that helps investors in stock markets and other reporting users to make rational investment decisions. Consequently, users resorted to accounting disclosure of sustainable development where investors need financial and non-financial information in a comprehensive manner, which may help them in making rational investment decisions. As per the foregoing, there is a need to indicate the impact of accounting disclosure of sustainable development practices, the social sector, the environmental dimension, and the economic dimension on rationalizing investment decisions.

# 2. Conceptual Framework

2.1 Accounting disclosure of sustainable development practices and the accounting for them

**2.1.1** **Sustainable Development Definitions:**

The most widespread definition is in the Brundtland report as "meeting the needs of the present without compromising the ability of future generations to meet their own needs". (Buallay, 2020)

The meaning of sustainability is reflected in the concept of the eco-capacity of an organization. This concept conveys that "a company should have the capacity to save the environment while improving its operational performance". (Amui, et al., 2017)

The researcher defines it as the ability to continue in the future and maximize the value of the company and achieve integration between the present and the future by achieving a balance between the economic, social, and environmental aspects and the efficiency in the use of natural resources so that economic activities do not exceed the maximum limits that work on the deterioration of the environment and the minimum limits to maintain community acceptance without conflicting this with the goal of the company in terms of achieving profits and strengthening its competitive position.

**2.1.2 Sustainable development dimensions:**

***Sustainable development includes three basic dimensions***

* **The first dimension: Economic dimension:**

The economic dimension does not only refer to profitability but also relates to providing sufficient cash to maintain liquidity and achieve a stable return for shareholders. (Papoutsi, 2018)

The economic dimension aims to improve human well-being by increasing its share of goods and services and achieving economic efficiency as it focuses on efficiency in the use of available resources to obtain the maximum benefits while preserving and using them in the future. The economic side is concerned with disclosing financial information to stakeholders and information about the organization’s impact on the macroeconomic system and the institution can provide additional information regarding its economic performance such as any changes that have occurred and affect the economic performance as well as any related risks or opportunities. (Abd alhalim, 2014)

* **The second Dimension: Environmental dimension:**

The environmental dimension refers to the preservation and importance of the overall elements of the living environment, such as plants and animals and non-living things such as air, water, and soil and preventing their deterioration and preventing undesirable changes in ecosystems, and using renewable natural resources in a way that does not lead to their decline or deterioration, which is the right of present and future generations. (El-Mallah et al.,2019)

* **The third dimension: Social dimension:**

The social dimension relates to the company’s responsibility towards the society in which it operates. (Sodhi, 2015).

Corporate social responsibility can be divided into two internal and external dimensions, The internal dimension relates to managing its human resources and includes practices related to employee health and well–being, improving the business climate, training, and continuous development, providing occupational health and safety standards for employees and workers equal pay between men and women with recognition of the capabilities of employee’s value and enhance it. (Papoutsi, 2018).

The external dimension relates to the societal aspects of enhancing the welfare of local communities, protecting natural resources, defending human rights, and supporting the community by making donations to vulnerable groups of the population. (Esposito et al., 2021)

**2.1.3 Sustainability accounting aims:**

Sustainability accounting is a subcategory of financial accounting focusing on accounting for and report of organizational non-financial performance information which directly affects the economy, society, and the environment to stakeholders. (Baskoro et al.,2021)

As it includes economic accounting information, social accounting information, and environmental accounting information and it can be used to make administrative decisions or strategic decisions related to the organization or to make economic decisions related to investment decisions, as well as to evaluate the performance of the company by stakeholders. (Junias et al.,2021)

**Benefits of maintaining sustainability accounting:** **(**Salcedo and Salcedo 2021**)**

* The possibility of a sustainability report for providing environmental and social information, thus linking financial benefits to expenditure.
* Sustainability reports view how external environmental and social costs are managed and reduced over time as a commitment to sustainability.
* Sustainability accounting may highlight the risks associated with social and environmental dimensions that are associated with financial performance.
* The ability to map stakeholder relationships, risks, and benefits which later encourages partnerships between stakeholders and entities.

**2.1.4 Sustainability Reporting:**

financial statements and reports are the main tools that investors rely on in making various decisions and with the rapid change in the business environment the traditional financial reports are no longer efficient in comprehensively representing the overall firms activities including nonfinancial activities and there was a need to expand the financial accounting framework to meet the new variables and sustainability reports emerged as a response to the increasing global impact on the impact of the environmental, social and economic dimensions on the activities of establishments. (Bashatweh and AlMomani,2020)

Sustainability reports can be defined as reports that provide financial and non-financial information to internal and external stakeholders to assess the economic, social, and environmental impact of the company’s activities, which helps them to make their appropriate economic decisions on time. (Bakheet et al., 2019)

**2.1.5 Benefits achieved by preparing sustainability reports:**

Disclosure of sustainability reports achieves many internal and external benefits for the company that does it, the most important of which are: ([[1]](#footnote-1))

1. **Internal Benefits:**

* Disclosure by companies of the sustainability report helps them to define a clear vision and strategy for work, which stimulates continuous improvement in the areas of performance disclosed, and the provision of more sustainable products and services, thus increasing the demand for the company’s products and services.
* Emphasizing the link between financial and non-financial performance.
* The sustainability report contains information about the efficiency in the optimal use of available natural resources, which helps companies focus on how to protect and improve the available resources and re-exploit waste, which leads to the creation of financial value for the company.
* Building long-term strategies, policies, and business plans that contribute to simplifying operations, reducing costs, and improving efficiency.
* Compliance with environmental and social legislation and regulations.
* Disclosure of the sustainability report helps management manage the risks that the company may be exposed to, prepare appropriate procedures for them, and speed its response to improve operations and areas that improve the company’s performance.
* Issuing sustainability reports increased job satisfaction and employee loyalty.

1. **External benefits:**

* Improving the reputation of the establishment and achieving its competitive advantage, disclosure of information about Companies’ commitment to sustainability improves the performance and reputation of companies and achieves positive differentiation for them, especially in competitive markets.
* Minimizing the negative effects of companies’ activities on the environment and society, and disclosing economic, social, and environmental achievements, thus increasing the success of companies and increasing revenues and profits.

The researcher shows that many benefits can be achieved through sustainability reports and the main objective that drive companies preparing their sustainability report is to overcome traditional financial reports shortcoming and provide a complete picture of the company’s economic, social and environmental performance, as well as strengthening and enhancing the relationship between the company and stakeholders, which will positively affect the company’s value, survival and long-term continuity.

**2.1.6 Methods for disclosing sustainability reports:**

* **The first method: disclosure of sustainable development in separate reports from financial reports (Separation method): (**[[2]](#footnote-2)**)**

This method depends on the disclosure of environmental and social information in separate reports, independent of the basic financial reports, due to the different nature of environmental and social information from the financial information, as well as the independence of the sustainability accounting system, which requires preparing separate statements for the sustainability report to be attached to the traditional financial statements that reflect the economic situation of the company.

**The separate reports take three ways to disclose sustainable development:**

**a) Descriptive Disclosure:** This disclosure includes a description of the environmental and social activities undertaken by the company to fulfill its obligations and responsibilities towards the environment and society, without including any analysis of the elements of costs related to these activities or the value of the benefits that have been achieved from them.

**b) Quantitative Disclosure:** The disclosure includes a presentation of quantitative data related to sustainability performance which is represented in:

* Displaying the costs incurred by the company in each field of environmental and social activities, called (Input reports).
* Disclosure of the benefits achieved by the company as a result of practicing environmental and social activities called (Output reports).
* Disclosure and report on inputs and outputs together.

**c) Mixed Disclosure:** Both descriptive and quantitative disclosure are used to disclose the company’s performance and commitment to its environmental and social responsibility.

* **The second method: Sustainability report within the financial reports (Merging method):**

In this method, environmental and social performance information is combined with financial information in one report, i.e., Sustainability information is disclosed within the financial statements produced by the traditional accounting system, which gives a comprehensive picture of the overall performance of the company.

The researcher shows that the first method of disclosing sustainable development information is better, as the disclosure of social and environmental information within the financial statements obliges the users of the financial statements to read them completely to discover and track environmental and social information, which leads to misleading the users of the financial statements and the difficulty of accessing the sustainability information, especially that the nature of financial information is different from the nature of environmental and social information, and that traditional financial statements are prepared in accordance with generally accepted accounting principles and standards . In order for the financial statements to include environmental and social information, they must also be prepared in accordance with generally accepted accounting principles and standards, which are still optional and there is no standard obligating companies to disclose them, while financial information is mandatory for the companies to disclose them.

## **2.2 The role of accounting disclosure through sustainability reports on rationalizing the investment decision:**

**2.2.1 Investment Decisions’ Definition:**

Investment is the process of purchasing assets out of available resources, with the aim of reaping greater future benefits. In terms of the capitat market, these assets refer to financial assets i.e., securities and tradable instruments. Investment performance is the return-on-investment portfolio. (Ahmed and Shah, 2022)

An investor is an individual who commits money to an investment product to seek an expected return and the main concern of an investor is to maximize returns while minimizing risk.(Rahman and Gan, 2020)

The researcher shows that the investment decision is to sacrifice an amount or a financial asset owned by the investor during a period of time in order to preserve the capital and obtain a greater future return. The investor must rely on sufficient and appropriate information when choosing between various investment alternatives, and the decision should be based on economic, social and environmental criteria.

The decision should not be random or based on advice and remorse, taking into account the degree of risk and matching between the desired return and the risks related to it.

**2.2.2 Types of Investors:**

The investors are classified based on the level of risk accepted and the portfolio structure into: (Jurickova and Gregova, 2020)

* **Non risk investor:** the most important for him is certainty, when there is a high level of risk, his investments do not enter and do not remain on the bank deposit market even at the cost of a high return. If he decides invest in other than bank deposits, he remains with bonds, instruments money market and cash holdings.
* **A conservative investor:** it is a type of investor who prioritizes the element of safety and dislikes risk due to his limited resources.
* **A balanced investor:** this type symbolizes the vast majority of investors, as it is the rational investor who cares about the factors of return and risk in a balanced way.
* **The growth investor:** he is an investor whose portfolio is made up of 50% of shares. He prefers equity funds more than stock titles of reputable Companies.
* **An aggressive (dynamic) investor:** an investor who is willing to accept any degree of risk for profit. His portfolio is made up of 3/4 of it is shares and the rest of bonds and money market instruments.
* **A speculative investor:** is the investor who gives priority to the element of profitability, as it is more inclined to take risks to obtain high rates of return.

And the investors can be categorized into three categories based on their financial literacy, experience and purpose of investment namely, sentinel, followers and meticulous investors: (Asad et al.,, 2021)

* **Sentinel investors:** they have little financial literacy their risk propensity is always very law. They invest carefully and try their best to avert loss.
* **Followers’ investors:** they have low levels of financial literacy. They invest to earn extra money.
* **Meticulous investors:** they have high level of financial literacy. They do technical analysis, subscribe to different data bases and consult a small group of advisors or experts to take risks and to decide the investment portfolio.

**2.2.3 Objectives of Investment Decisions:**

**Investment decisions aim to: ([[3]](#footnote-3))**

* Maintaining the original capital: the investor seeks to preserve his capital and not squander his wealth, so he makes a comparison between investments and focuses on the alternative that achieve the largest return and the least degree of risk. If the project does not achieve a profit, the investor seeks to preserve his capital and avoid losing it.
* Achieving the right return: profit is one of the most important motives that push the investor to invest his money to achieve an adequate return and appropriate profitability. The return that the investor gets is one of the most important criteria that the investor relies on when making his decision to invest in one project over the other.
* Continuity and increase Income: The investor aims to achieve continuous and stable income at a certain pace away from disturbances and risks, to raise his standard of living, maintain the continuity of investment activity and increase his production capacity.
* Ensure the necessary liquidity: achieving liquidity for the investor means that has liquidity and cash ready to cover the work requirements and the production process, and to pay the liabilities when they are due.

**2.2.4 Principles for making investment decisions:**

People make a variety of financial decisions everyday about saving, investing and borrowing, and the global market place is becoming risky and more vulnerable. (Kumari, 2020)

So, investors must follow the following principles when making an investment decision:([[4]](#footnote-4))

* **Principle of choice:** This principle requires that the investor is to be able to compare between investment alternatives and choose the best alternative that suits the goal he seeks to achieve.
* **Principle of Relevance:** this principle assumes that the investor chooses the investment that suits his subjective characteristics such as income, age, job, subjective tendencies and risk tolerance.
* **The principle of experience and qualification:** This principle requires that making a rational investment decision requires the expertise of investors. There is a category of professional investors who have sufficient experience and knowledge that qualifies them to make the investment decision. And there is a category that has surplus cash that they want to invest, but they do not have sufficient knowledge and experience to choose the appropriate investment tool.
* **The principle of diversification "Distribution of investment risks":** This principle requires the investor, whether an individual or a company, to diversify his investments in order to achieve the best return and distribution of investment risks.
* **Principle of objectivity:** This principle assumes that all financial indicators used in in the comparison are characterized by objectivity and impartiality in the measurement process.
* **Principle of comparison:** The principle is based on the fact that the investor must use the tools of analysis and evaluation when making a comparison between the available alternatives and choosing the best alternatives that the investor prefers.

**2.2.5 The Importance of sustainability reports in rationalizing investment decision:**

As a result of the increased awareness of investors and their interest in sustainable development issues, the investor preferred to direct his investments towards companies that integrate sustainability into their strategy, as disclosure about sustainability reports has an important role in rationalizing investment decisions, it provides economic, social and environmental information and the ability of the company to meet their environmental and social obligations, as well as its economic performance which is reflected positively on investors decisions.

***Sustainability reports achieve the following benefits for rationalizing investment decisions:***

* Sustainability reports help users to understand the performance of the company, to perform the analysis, comparison and understanding of financial and non- financial information's to take the appropriate decision, and help them form a basis for forecasting future results and projected cash flows. (Almagtome and Abbas, 2020)
* Sustainability reports provide concise and clear information about the value of the company, increasing investment opportunities, reducing risks, and optimal distribution of capital, which leads to an increase in the return on investment in the long run. (Shaheen et al.,, 2019)
* Disclosure of sustainability reports help investors to evaluate the positive and negative effects of company's activities, which enables them to assess the extent to which the company its social and environmental responsibility, in addition to economic responsibility and reassurance of the survival of the company and its continuity.
* Disclosure of sustainability reports helps to increase the market value of the company's shares, as investors evaluate the companies that disclose sustainable development practices with greater values ​​than those companies that do not disclose those practices, and thus increases the efficiency of investment decisions, as it provides appropriate information about the expected value Thus, it improves the image of the company and works to attract more investors. (Al Ajmi, 2022)
* Sustainability report combine financial and non- financial information as it includes the three dimensions of sustainability, to meet the different needs of stake holders, assess the company's ability to create sustainable value and make more effective and efficient decisions. (Bicer and Eldarewi , 2019)

# 3. Literature Review and Hypotheses Development

## In the study of **(**Lascar & et. al. 2016), the study's main objective was to investigate sustainability practices in Indian companies by examining the quality of disclosure, the impact of sustainability on the performance of companies, and the relevance of the guidelines for sustainability disclosure to form the content of reports. The study analyzed reports of 28 Indian companies not listed in the stock market, using content analysis methodology, as the impact of sustainability performance on corporate performance was examined using an appropriate regression model.

The study revealed that the average level of disclosure of sustainability is 88% of the respondent companies, while the average quality of disclosure is 80%. The study concluded that sustainability affects the performance of companies positively and significantly and that the respondent reports work within the guidelines of the Global Reports Initiative, however, these Principles are not enough, and there is room for improvement in the direction of the desired quality.

In the same vein, the study of (Alotaibi,2021), the study aimed to identify the impact of accounting disclosure on sustainable development on the quality of financial reports and the extent of this reflection on the value of the company.

The study concluded that there is an impact between the accounting disclosure and the standards of compatibility and comparability is more than clarity transparency and credibility. The accounting disclosure on sustainable development also had an impact on the value of the company if any other investment influences that helped the growth of the company's value or its stability in some years.

Many accounting and financial studies have emphasized the importance of accounting disclosure in general and its link to achieving the values of abuse, transparency and credibility, and its contribution to achieving social responsibility, as indicated and noted by many studies on the link of accounting disclosure about the sustainable development and improving the quality of information and financial reports.

The study of (Mutiva et al. 2015) aimed to analyze the relationship between voluntary disclosure and financial performance, achieve this goal, and examine the financial reports of a sample of 10 companies registered on the Nairobi Stock Exchange during the period from 2011 to 2013. The study built a disclosure index consisting of general information about the company and information strategy, future information, social and environmental information and the board of directors. It was found that the optional disclosure has a significant impact on the rate of return on investment, as it leads to increased transparency and credibility in financial reports, which is reflected in the increase in investor confidence in the company's financial decisions and lower the cost of capital.

## In the study of (Arafa and Meligy ,2016), the study aimed to explore the nature of the relation between the disclosure of sustainable development and the quality of financial reports, in addition to examining the impact of the quality of corporate governance systems within companies on that relation.

The study's main result was that companies registered in the Saudi business environment adopt the voluntary disclosure of sustainable development by presenting an annual report that includes this information or issuing a separate report with the importance of disclosure through its website, which may reflect positively on attracting investors and their investment decisions.

Also, companies adopt the voluntary disclosure of sustainable development by activating governance mechanisms because they have a positive impact on the relation between accounting disclosure and the quality of financial reports, as they limit opportunistic behavior of management and encourage companies to achieve more transparency in financial reporting.

## In the study of (Muharram ,2019), The objective of the study was to identify the role of disclosure of the dimensions of social responsibility (i.e. social, environmental and economic dimensions) in improving the quality of the parameters of financial reports in banks listed on the stock exchange. Consequently, the study provides a suggested framework for the disclosure of social responsibility in banks to obtain reports and financial statements that are more comprehensive and with higher quality for beneficiaries to achieve rational economic decisions and stimulate the capital market, thereby maximizing the value of the bank.

The study indicated that there is a discrepancy between the banks regarding the level of disclosure of social responsibility data. The study also revealed that there is a significant relationship between the disclosure of elements of the social dimension and the economic dimension and the quality of the informative content for financial reports. Also, there is no significant relationship between the disclosure of elements of the environmental dimension and the quality of the information content of the financial reports. These findings support the inclusion of social and environmental responsibility within the responsibilities of the management of Egyptian banks in order to become mandatory that banks must report and disclose to improve the value of banks and increase the quality of financial reports for these banks.

The study of (Jaff &et. al,2021), This study aimed at testing the potential impact of the disclosure of the main variables of sustainable development on the quality of financial reports, in a developing country, Iraq, To achieve its goal this study relied on an analysis of a sample from 91 financial reports of the Iraqi commercial banks listed on the Iraq Stock Exchange during the period 2012-2018. The results prove that disclosure of the dimensions of sustainable development as a whole has a positive impact on the quality of financial reports in commercial banks in Iraq.

Investment is considered the backbone of the economy and the mainstay of economic continuity in countries and it plays an important role in the development of societies. There are many accounting and financial studies that emphasized the importance of investment decisions and the risks associated with them.

The study of (Zahid & Ghazali 2015) aimed to examine the application of the sustainability practice of listed real estate investment companies and Malaysian real estate companies not listed in the stock market. The study examined the three dimensions of sustainability, namely, the economic dimension, the social dimension, and the environmental dimension, using a method of content analysis of a sample consisting of 113 companies, including 23 real estate investment companies and 90 real estate companies, by analyzing the content of the annual report and social responsibility for the data extracted from the companies' websites. The study observed that the majority of companies have a social responsibility and strategies for sustainability to satisfy the needs of users and to legalize practices about sustainability. However, there is a variation in approaches to adopting sustainability, and disclosure and reporting procedures on the sustainable performance of these companies. Among the three dimensions of sustainability, social disclosure has the largest share, while environmental disclosure was the lowest of the three dimensions. In general, the sustainability report is somewhat weak but there is an inclination for full disclosure.

The study of (Ali & Abdullah 2018), aimed to identify the concept, importance, objectives, and role of the quality of financial reports in light of the application of sustainable development accounting. It also tried to show the role of the quality of accounting information and its effectiveness in rationalizing investment decisions for companies listed on the Khartoum Stock Exchange. It was found the quality of financial reports helps rationalize decisions of securities investment and that the reliability of accounting information contributes to avoiding the risks of decisions of securities investment.

## The Study of (Al-Amin 2018), the objective of study was to identify the level of awareness among decision-makers in Sudanese banks, the extent of the impact of these reports on their investment decisions, and the method to determine the size of financing for sectors interested in sustainability in the Sudanese banking sector.

It also aimed to recognize the relationship between the report on sustainability accounting and transparency of performance and its evaluation in terms of making all important information available to users and customers of Sudanese banks.

It also tried to explain the impact of the report on sustainability accounting, through the report on environmental, social and economic accounting, on investment decisions of clients towards banks operating in Sudan and shareholders, bonds and treasury bills.

The study found that the sustainability reports disclosed the economic performance indicators and reduced the risks of investment banks' decisions.

It also clarified that the appointment of a sustainability committee in banks contributed to the report on social assistance, which leads to increased transparency of financial performance and reduces the risks of investment decisions.

It also revealed that the tripartite banks’ report on economic, social and environmental sustainability met the needs of users and increased the transparency of its financial performance and efficiency in managing the risks of investment decisions.

## The Study of (Gazya, 2018), the study aimed to examine the economic, social and environmental impact when preparing accounting disclosure reports on sustainable development. Also, it tried to explain the impact of the report on the accounting disclosure of sustainable development on the investment decisions of customers.

It also attempted to identify the extent of Egyptian banks' dependence on accounting disclosure of sustainable development in managing risks in a reasonable manner. Another aim of the study is to examine the level of awareness of those interested in taking decisions in Egyptian banks and their effect on decision-making.

The study concluded that the accounting disclosure of sustainable development as an indicator of economic performance was an incentive to increase profits and the size of banks’ assets. It found that the accounting disclosure determines the form of the tripartite sustainability report and its cost and return and serves the economic performance indicators of the country which reduces the risks of investment decisions.

It also revealed that the accounting disclosure of the sustainable development of the social dimension increased the responsibility of banks towards society as well as the influence of bank customers, which limited the risks of investment decisions to increase their confidence in banks.

Moreover, it found that accounting disclosure of sustainable development of environmental policies contributed to controlling the costs of pollution and improving the quality of sustainability reports, which reduced the risks of investment decisions.

In light of the findings provided in the previous literature, the following key hypothesis is suggested:

H1: There is a statistically significant relationship between the accounting disclosure of sustainable development practices and improving the reputation of the entity.

H2: There is a statistically significant relationship between the accounting disclosure of sustainable development practices and improving the quality of information.

H3: There is a statistically significant relationship between the accounting disclosure of sustainable development practices and the rationalization of investment decisions.

**4. Research Methodology**

**4.1 Research methods:**

In the experimental study, the researcher depends on a questionnaire in the form of questions with and without set answers and was formulated in the light of the research hypotheses and aims. The questionnaire was distributed to a sample consisting of the teaching staff recruited in Egyptian universities, Accountants and Auditors in accounting and auditing offices and investors and financial analysts in securities trading companies.

**4.2 The survey groups:**

The total sample size can be determined by the following formula (Kish 1965):



The researcher distributed 209 questionnaires on teaching staff, accountants, auditors and investors and financial analysts. Then collected 167 questionnaires, 13 of 167 were invalid due to the missing data. The usable questionnaires were 154 respondents.

**4.3 The reliability and validity statistics:**

To determine the validity and reliability of the tool used to measure the responses of the items sampled, the researcher used both the internal consistency coefficient to measure the validity of the results achieved for each item of the investigation, and Alpha Cronbach's coefficient to measure the reliability of the study items, and the results were as in the following table:

**Table (1): The reliability and validity statistics**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Study groups** | **No. of Items** | **Cronbach's Alpha** | **Validity Coefficient** | **Sig.  (2-tailed)** |
| Group one: The first hypothesis | 22 | .904 | .946\*\* | .000 |
| Group Two: The second hypothesis | 18 | .915 | .956\*\* | .000 |
| Group Three: The third hypothesis | 23 | .932 | .947\*\* | .000 |
| **The questionnaire as a whole** | 63 | .969 | **---** | **---** |

***Source*:** Prepared by the researcher based on the results of the statistical analysis (SPSS).

The previous table shows that the Alpha Cronbach's coefficient is greater than 80% for all study groups, in addition, the Alpha Cronbach's coefficient for the study groups as a whole is equal to (0.969) and therefore can be depended on to measure the study groups of the questionnaire. **This confirms that** the questionnaire measures what it was built for, and that all items of the study are clear to the respondents and there is no ambiguity and if the researcher applies the questionnaire a second time to the same sample will give almost the same results.

The values ​​of internal consistency coefficients for the first, second and third hypothesis as a whole are close to the correct one, indicating that the internal consistency between questions of the questionnaire is very strong and acceptable.

**4.4 Tests of hypotheses and Descriptive Statistics:**

***The third hypothesis:***

**"There is a statistically significant relationship between the accounting disclosure of sustainable development practices and the rationalization of investment decisions".**

**To test this hypothesis**, the researcher used the descriptive statistics by calculating the mean, standard deviation, coefficient of variation and T-test as the following:

**Table (2): Descriptive Statistics and T- test for items of " the third group"**

| **Items** | **Mean** | **Std. Deviation** | **Coef. of variation** | **T-test** | **Sig.** |
| --- | --- | --- | --- | --- | --- |
| 1. Disclosure of sustainable development practices increases the awareness, realization and confidence of users towards the entity and rationalizes their investment decisions. | 4.311 | .70959 | 0.1645 | 22.939 | .000 |
| 2. Investment decisions differ according to the different alternatives for disclosing financial information (profitability rates - liquidity rates - growth rates in financial performance - rate of return on investment) that are supported by sustainability reports. | 4.383 | .72489 | 0.1653 | 23.678 | .000 |
| 3. Investment decisions are affected by the different alternatives for disclosing non-financial indicators (product quality - employee skills - technology used - ethical and legal dimensions) that are supported by sustainability reports. | 4.272 | .64951 | 0.1520 | 24.317 | .000 |
| 4. The quality of financial and non-financial reports plays an important role in accounting disclosure, through which the degree of commitment to the Egyptian index can be measured as evidence of its fulfillment of social and environmental responsibility, and thus support future plans for the investment decision. | 4.305 | .68911 | 0.1600 | 23.504 | .000 |
| 5. Guidelines or controls such as the principles of the Global Reporting Initiative (GRI) are adhered to when preparing sustainability reports to ensure the provision of information that helps rationalize investment decisions. | 4.376 | .75907 | 0.1734 | 22.506 | .000 |
| 6. The company's measurement and disclosure of its economic contributions to society encourages investors to invest in it. | 4.318 | .69267 | 0.1604 | 23.616 | .000 |
| 7. Disclosure of sustainable development practices increases the transparency of financial performance and reduces the risks of investment decisions. | 4.129 | .72941 | 0.1766 | 19.223 | .000 |
| 8. Investors' decisions are influenced by industrial information related to an industry, such as the risk of competitors, whether current or potential, and the risk of substitute products. | 4.246 | .75244 | 0.1771 | 20.562 | .000 |
| 9. Disclosure of future information such as management's expectations about revenues, earnings per share and return on investment for a certain period is an important source of information that investors care about when making their investment decisions. | 4.305 | .71700 | 0.1665 | 22.590 | .000 |
| 10. The issuance of sustainability reports is a response to stakeholders' need for information. | 4.253 | .76322 | 0.1794 | 20.377 | .000 |
| 11. Sustainability reports aim to take into account the balance to provide information to all parties associated with the entity. | 4.298 | .64807 | 0.1507 | 24.868 | .000 |
| 12. The sustainability report meets the needs of all stakeholders for financial and non-financial information. | 4.188 | .76500 | 0.1826 | 19.277 | .000 |
| 13. The information disclosed in the sustainability reports is sufficient to make a rational investment decision. | 4.103 | .81785 | 0.1992 | 16.750 | .000 |
| 14. Sustainability reports provide the various relevant parties with clear, correct and consistent information that enables them to make and rationalize investment decisions. | 4.116 | .74050 | 0.1798 | 18.717 | .000 |
| 15. Increasing investor awareness affects the preparation and presentation of sustainability reports. | 4.318 | .72043 | 0.1668 | 22.706 | .000 |
| 16. Reviewing environmental and social information in sustainability reports alongside financial information increases the confidence of users of sustainability reports and the possibility of relying on them to make a rational investment decision. | 4.415 | .65381 | 0.1480 | 26.869 | .000 |
| 17. Sustainability reports should focus on the organization's strategy and in a way that enables stakeholders to assess returns, risks, and the ability to grow and continue. | 4.266 | .69585 | 0.1631 | 22.582 | .000 |
| 18. Attention to sustainable development practices works to maximize the wealth of stakeholders by achieving economic benefits and welfare for the community. | 4.175 | .73327 | 0.1756 | 19.891 | .000 |
| 19. Disclosure of sustainable development practices works to satisfy customers and gain their trust through disclosure and transparency of the development and development plans of the entity, including community contributions. | 4.305 | .66004 | 0.1533 | 24.539 | .000 |
| 20. Financial information about profitability, cash flows, and others represent the main axis for making decisions by the stakeholders of the facility (such as investors, creditors, lenders, government agencies and employees). | 4.337 | .71602 | 0.1650 | 23.184 | .000 |
| 21. Liquidity rates as an indicator of companies' ability to pay are an important determinant in the decision-making process. | 4.389 | .60835 | 0.1385 | 28.347 | .000 |
| 22. Information contained in corporate sustainability reports on social and environmental aspects contributes to assessing corporate risks when making credit decisions. | 4.240 | .70530 | 0.1663 | 21.822 | .000 |
| 23. The company's disclosure of its environmental contributions encourages investment in it. | 4.298 | .73324 | 0.1705 | 21.980 | .000 |

***Source*:** Prepared by the researcher based on the results of the statistical analysis (SPSS).

The previous table shows that the mean of all items is greater than (3), which means that most of respondents agree about all items of the third group. In addition to the level of significance for these items is less than 0.01 (Sig < 0.01), therefore, it can be concluded that all items are statistically significantly, which confirms that there is an agreement about these items. And the following chart shows the mean opinions of the respondents about items of " the third group"

**Chart (1): The mean opinions of the respondents about items of   
" the third group"**

The standard deviation ranges from (0.6083:0.8178) and is a small percentage and the coefficient of variation is less than 30%, which indicating that the dispersion in most sample' answers to these items is low.

The overall response to these items of the third group shows that (2.09%) of the respondents are (strongly disagree and disagree), (8.64%) of the respondents are (neutral) and (89.27%) of the respondents are (agree and strongly agree).

**According to the previous results** **we accept the hypothesis**, which means that there is a statistically significant relationship between the accounting disclosure of sustainable development practices and the rationalization of investment decisions.

**5. Conclusions and Recommendations**

**5.1 Conclusions**

The main aim was to show the impact of accounting disclosure for sustainable development on rationalizing investors' decisions. The findings of the current study revealed that accounting disclosure about sustainable development practices achieves many internal and external advantages that may reflect positively on the value of the entity, strengthen its reputation, and works to attract investors to it. When companies prepare sustainability reports, they show their commitment to transparency, create value for companies, keep a corporate competitive advantage, trust, employee recruitment and retention, enhance operational efficiency and consequently attract more investors and customers. Accounting disclosure about sustainable development has an important role on rationalizing investors' decisions, as it provides sufficient and appropriate information about the economic, social and environmental aspects of the company that helps investors study, analyze and evaluate the available investment alternatives.

**5.2 Recommendations**

Relying on study findings, and in the light of research objectives, the researcher recommends the following:

1. The need for companies to make more accounting disclosures about sustainable development practices and prepare sustainability reports as separate reports in which they disclose financial and non-financial information for their activities in line with the guidelines of the Global Reporting Initiative (GRI).
2. The need for the intervention of the state and specialized professional bodies to enact laws and legislation obligates companies to issue an accounting report on sustainable development practices with the need to approve it from an external auditor such as annual financial reports.
3. The necessity of issuing an accounting standard for sustainable development that includes defining the intellectual framework for accounting for sustainable development and how to measure, report and disclose it.
4. The necessity of the entities’ interest in disclosing the effects of their environmental and social operations extensively in the sustainability reports, which leads to an increase in the community’s trust and respect for those entities and the improvement of the relationship with government authorities as a result of the moral commitment of the entities and their responsibilities towards the community.

# References

Abd alhalim, A.H.M. (2019). The extent to which Saudi joint stock companies disclose sustainable development practices in their financial reports: a field study. *Journal of Administrative and Economic Sciences*. 13(1), 61-115. Retrieved from: [http://search.mandumah.com/Record/1078427.](http://search.mandumah.com/Record/1078427.%20(In)  (In Arabic).

Ahmad, M., & Shah, S. Z. A. (2022). Overconfidence heuristic-driven bias in investment decision-making and performance: mediating effects of risk perception and moderating effects of financial literacy. *Journal of Economic and Administrative Sciences*, 38(1), 60-90.

Ahmed, O‏. (2021). The contribution of the quality of financial information in rationalizing investors’ decisions at the level of the stock market: a field study of the opinions of a sample of professionals and academics in Algeria. *Journal of Economic Reforms and Integration in the Global Economy*, 15(1), 45-60.( In Arabic).

Al Ajmi, S.S.S. (2022, February, 2-3). The impact of accounting disclosure on sustainable development on the market value of the shares of companies listed in the Kuwaiti Stock Exchange. *The First International Scientific Conference, the vision of financial and administrative thought in the era of digitalization to achieve sustainable development 2030*. Sadat City University. (In Arabic).

Alamin, W.M.M (2018). The role of sustainability accounting reports in performance transparency achieving and reducing of investment decisions risks. Doctoral dissertation, University of Neelain. ( In Arabic).

Al-Ashibi, B.F.A. (2016). The extent to which investors perceive the informational content of financial reports and their impact on investment decisions: An exploratory study on a sample of institutional investors in the Libyan stock market, Master’s thesis, Faculty of Commerce, Benghazi University.)In Arabic).

Ali, M.N.E and Abdullah, M.E.(2018). The impact of the quality of accounting information on investors’ decisions in light of the application of sustainable development accounting: a field study on companies listed in the Khartoum Stock Exchange, *postgraduate journal,*11(41), 48-77.(In Arabic)

Almagtome,A. & Abbas,Z. (2020). Value Relvance of Financial Performance Measures: An Empirical study. *International Journal of PSY Chological Rehabilitation*, 24(7), 6777-6791.

Alotaibi, K. O. (2021). The Effect of Accounting Disclosure for Sustainable Development on the Quality of Financial Report and the Extent of Its Reflection on the Company Value. *Multicultural Education*, *7*(5), 244-259.

Amui, L. B. L., Jabbour, C. J. C., de Sousa Jabbour, A. B. L., & Kannan, D. (2017). Sustainability as a dynamic organizational capability: a systematic review and a future agenda toward a sustainable transition. *Journal of cleaner production*, *142*, 308-322.‏ Retrieved From: <https://doi.org/10.1016/j.jclepro.2016.07.103>.

Arafa, N.T.H and Meligy,& Magdy Meligy Abd-Elhakim.(2016). Disclosure of sustainable development and the quality of financial reports: An applied study on Saudi companies. *Journal of Accounting Thought,* 20(7) 511-542. (In Arabic)

Asad, H., Toqeer, I., & Mahmood, K. (2021). A qualitative phenomenological exploration of social mood and investors’ risk tolerance in an emerging economy. *Qualitative Research in Financial Markets*, 14(1), 189-211.

Bakheet, M.B.E.D., Abdulsalam, M. and Abdel Razek, M.M. (2019). Study of the impact of sustainability reports on the financial performance of companies - an applied study on real estate companies listed in the Egyptian index of social responsibility S/P/EGX-ESC. *Alexandria Journal of Accounting Research,* 3(2), 74-105. (In Arabic).

Bashatweh, A. D., & AlMomani, S. N. (2020). The effect of accounting disclosure about sustainability reports on the ability of banks to going concern-Case Study of Arab Bank. *Business and Economic Research*, *10*(2), 234-249.‏

Baskoro, A., Umar, H., & Indriani, A. (2021). The Influence of Corporate Social Responsibility (CSR) Disclosure and Sustainability Accounting on Earnings Response Coefficient (ERC).‏*International Journal of Current Science Research and Review*, 4(7),684-691.

Bicer,A & Eldarewi,E.A.(2019). Environmental Costs and its role in improving the quality of financial reporting: A case study in libya*, International Journal of Research in Business and Social Science*, 8(5) 194-211.

Buallay, A. M. (2020). *The level of sustainability reporting and its impact on firm performance: the moderating role of a country’s sustainability reporting law* (Doctoral dissertation, Brunel University London). Retrieved from: <http://bura.brunel.ac.uk/handle/2438/21254>.

Crifo, P., & Forget, V. D. (2015). The economics of corporate social responsibility: A firm‐level perspective survey. *Journal of Economic Surveys*, *29*(1), 112-130.‏

El Sayed, A. S. A. K., & Hussein, A. M. (2019). -Role of Financial Derivatives in Rationalizing Investment Decisions-Field study on sample of brokerage firms in Khartoum stock of exchange. *Journal of Economic, Administrative and Legal Sciences.* 3(4), 1-20.

Elhag, W. (2017). Accounting disclosure of sustainable development reports and its impact on evaluating the performance of enterprises*. Postgraduate Journal,* 8(29), 98-130. (In Arabic)

El-Mallah, R. K. E. D., Abd el Hamid Aref, A., & Sherif, S. (2019). The role of social responsibility in protecting the environment–a case of the petrochemical companies in Alexandria Governorate. *Review of Economics and Political Science*.‏2631-3561.

Esposito, B., Sessa, M. R., Sica, D., & Malandrino, O. (2021). Exploring Corporate Social Responsibility in the Italian wine sector through websites. *The TQM Journal*.‏ 33(7), 1754-2731. Available from: https://www.emerald.com/insight/1754-2731.htm

Gazya, G.M.m.K.(2018). The impact of accounting disclosure on sustainable development in reducing the risks of investment decisions: A Field Study. *Journal of Accounting Thought*. 22(4), 404-429. ( In Arabic).

Halima, A. and Lamin, A.M. (2020). The Role of Financial Investment Determinants in Making Investment Decisions in the Capital Market. *Al-Manhal Economic Journal*, 3(2), 25-44.( In Arabic). <https://doi.org/10.1111/poms.12393>.

Jaff, R., Al-Kake, F., & Hamawandy, N. (2021). The impact of the sustainable development dimensions on the quality of financial reports. *Accounting*, *7*(2), 363-372.‏

Junias, D. T. S., Suharto, R. S. B., & Elim, M. A. (2021, April). The Impact of Managerial Ownership on Sustainability Accounting. In *International Conference on Applied Science and Technology on Social Science (ICAST-SS 2020)*, 72-75. Atlantis Press.‏

Jurickova, V., & Gregova, E. (2020 ,May,21-22 ). Earnings management and it´s effect on behavior of investors. 54th International Scientific Conference on Economic and Social Develoment*: Book of Proceedings*, 246-252.‏

Khayr, E.A.A. and Hussain, M.A.M. (2019). The role of financial derivatives in rationalizing investment decisions: a field study on a sample of brokerage firms in the Khartoum Stock Exchange.

Kumari, D. T. (2020). The Impact of Financial Literacy on Investment Decisions: With Special Reference to Undergraduates in Western Province, Sri Lanka. *Asian Journal of Contemporary Education*, *4*(2), 110-126.‏

Laskar, N., & Maji, S. G. (2016). Corporate sustainability reporting practices in India: myth or reality? *Social Responsibility Journal*.‏12(4),625-641.

Mansur, A.E. and Ali, W.S.E.M. (2019). The effect of expanding the accounting disclosure of social responsibility information on supporting the competitive advantage of Saudanese: a field study on sugar industry companies in Sudan. *Post Graduate Journal*, 14(54), 132-151. (In Arabic).

Mansur,A & Ali,W.(2019).The effect of expanding the accounting disclosure of social responsibility information on supporting the competitive advantage of Sudanese industrial companies: a field study on sugar manufacturing companies in Sudan. *Journal of postgraduate studies.* 14(54), 132-153.(In Arabic)

Morkous, F.A.F. (2014). Assessing the extent to which companies listed on the Egyptian Stock Exchange comply with the requirements of accounting disclosure and the report on sustainability performance: an empirical study, *The Journal of Commercial Studies and Research*. 1(2), 475-540.

Muharram, A.H.M. (2019). The role of social responsibility disclosure in improving the quality of the informational content of financial reports: a field study on banks listed on the Egyptian Stock Exchange. *Journal of Accounting Thought.* 23(1), 173-227. (In Arabic)

Mutiva, J. M., Ahmed, A. H., & Muiruri-Ndirangu, J. W. (2015). The relationship between voluntary disclosure and financial performance of companies quoted at the Nairobi Securities Exchange. *International Journal of Managerial Studies and Research*, *3*(6), 171-195.‏

Oluwagbemiga, E.O. (2014). The use of voluntary disclosure in determining the quality of financial stateents :Evidence from the Nigeria listed companies. *Serbian journal of management*, 9(2), 263-280.

Papoutsi, A. (2018). *An exploration of the disclosure of practices for environmental and social sustainability in sustainability reports* (Doctoral dissertation) Faculty of Management Cass Business School, University of London Institutional Repository. Retrieved from: https://openaccess.city.ac.uk/id/eprint/19260.

Petrescu, A. G., Bilcan, F. R., Petrescu, M., Holban Oncioiu, I., Türkeș, M. C., & Căpuşneanu, S. (2020). Assessing the benefits of the sustainability reporting practices in the top Romanian companies. *Sustainability*, *12*(8), 3470.‏

Rahman, M., & Gan, S. S. (2020). Generation Y investment decision: an analysis using behavioural factors. *Managerial Finance*, 46(8), 1023-1041.

Salcedo, A. V., & Salcedo, S. S. (2021). Towards a Sustainable Future: Promoting Sustainability, Sustainability Accounting and Reporting among Future Professional Accountants. *Journal of Governance Risk Management Compliance and Sustainability*, *1*(1), 76-90.‏

Shahen,A.A. Elmihi, R.A and Bastawisi, M.A,A. An analytical study of the extent to which the Egyptian sustainability index companies are committed to the framework of the International Council for Integrated Reports and a role in rationalizing investor decisions. *The Scientific Journal of Financial and Administrative Studies and Research*. 3(1), 173-212. (In Arabic).

Sodhi, M. S. (2015). Conceptualizing social responsibility in operations via stakeholder resource‐based view. *Production and Operations Management*, *24*(9), 1375-1389.‏ Retrieved from:

Solomon, J. F., Solomon, A., Norton, S. D., & Joseph, N. L. (2011). Private climate change reporting: an emerging discourse of risk and opportunity?. *Accounting, Auditing & Accountability Journal*, 24(8), 1119-1148.

Steyn, M. (2014). Organisational benefits and implementation challenges of mandatory integrated reporting: Perspectives of senior executives at South African listed companies. *Sustainability Accounting, Management and Policy Journal*, 5(4), 476-503.

Sukhorukova, O., Sikorsky, I., Grygorova, Z., Kvasko, A., & Siryk, M. (2021). Principles and components of combining investment activities with strategic management of a company. *Academy of Strategic Management Journal*, *20*(2).‏

Usmani, M. (2018). *The visual disclosure of information in stand-alone sustainability reports: a study of impression management* (Doctoral dissertation), Royal Holloway, University of London.‏ Retrieved from: [0000 0004 8500 2100](http://isni.org/isni/0000000485002100).

Wally, M.Z.E and Ali,M.S.M. (2013). The role of electronic accounting disclosure in reducing risks under conditions of uncertainity for the purpose of making investment decisions. *Accounting Thought,* 17, 59-92 Retrieved from: <http://search.mandumah.com/Record/474282>. (In Arabic).

Xiao, J. Z., Gao, S. S., Heravi, S., & Cheung, Y. C. (2005). The impact of social and economic development on corporate social and environmental disclosure in Hong Kong and the UK. *Advances in International Accounting*, *18*, 219-243.‏

Zahid, M. and Ghazali, Z. (2015). Corporate sustainability practices among Malaysian REITs and property listed companies. *World Journal of Science, Technology and Sustainable Development* .12(2), 100-118.

1. () **For more details regarding this information see the following issues:**

   |  |  |
   | --- | --- |
   | Petrescu, 2020  Usmani ,2018  Ferro et al.,2015 | Crifo and Forget,2015  Solomon, et al.,2011 |

   [↑](#footnote-ref-1)
2. () **For more details regarding this information see the following issues:**

   Steyn,2014

   Morkous,2017 [↑](#footnote-ref-2)
3. () **For more details regarding this information see the following issues:**

   Khayr and Hussain,2019.

   Al-Ashibi,2016. [↑](#footnote-ref-3)
4. () **For more details regarding this information see the following issues:**

   Sukhorukova et al.,2020

   Ahmed,2021

   Attia and Alwan,2020. [↑](#footnote-ref-4)