THE CLIMATE CHANGE DISCLOSURE IN PRE AND DURING COVID 19: EVIDENCE FROM EGYPTIAN COMPANIES.

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ABSTRACT:

Purpose: The objective of this research is to reflect on how the quality of climate change disclosure may evolve in response to COVID 19 pandemic-related risks. The year 2020, marked by record-breaking temperatures and brought to light the pervasive nature of pandemic and climate change threats. Consequently, stakeholders have a reasonable expectation that risks disclosure should have provided them with adequate stimulus packages for the ensuing consequences. The analysis explores tendency of the corporations listed on the Egyptian Stock Exchange EGX 100 index to disclose climate change risks pre and during COVID 19 pandemic because although these reports are often voluntary, non- quantitative and socially constructed, they contribute significantly for determining corporates' beliefs, values and motives.

Method: Throughout adoption the content analysis, the annual, and standalone reports of corporations were scrutinised during the period from 2019 to 2022.

Results: The pandemic has led to increased scrutiny, economic uncertainty, and new opportunities for corporations to demonstrate their commitment to sustainability and climate change mitigation, driving greater demand for transparency and disclosure. These results supported arguments that corporations respond to stakeholders' expectations and institutional pressures in form of climate change disclosure to maintain or enhance their reputation

Originality/value: The research contributes to the recent literature on climate change risk disclosure and highlight future directions in the wake of the COVID-19 pandemic.

Keywords: COVID-19, Climate change disclosure, Institutional theory, legitimacy theory, Greenhouse gas emissions.

الملخص : الغرض من البحث هو دراسة تطور جودة الإفصاح عن مخاطر تغير المناخ استجابة لجائحة كوفيد-19 في الشركات المصرية، حيث يبحث في ميل الشركات إلى الإفصاح عن مخاطر تغير المناخ قبل وأثناء الجائحة. النتائج تشير إلى أن الجائحة أدت إلى زيادة التدقيق وعدم اليقين الاقتصادي، وفرص جديدة للشركات لإظهار التزامها بالاستدامة والتخفيف من تغير المناخ. تدعم هذه النتائج الحجج القائلة بأن الشركات تستجيب لتوقعات أصحاب المصلحة والضغوط المؤسسية في شكل الإفصاح عن مخاطر تغير المناخ. البحث يساهم في الأدبيات الحديثة حول الإفصاح عن مخاطر تغير المناخ ويسلط الضوء على الاتجاهات المستقبلية في أعقاب جائحة كوفيد-19.

1. Introduction:

Environmental issues in the 21st century and the foreseeable future emphasize the significance for corporations to boost their responsibilities towards the ecosystem (Li et al., 2018). The mounting scientific evidence on the devastating impact of human activities on Earth's biodiversity has galvanized the sustainability reporting movement, emphasizing the necessity for corporations to prioritize environmental accountability and transparency (Li et al., 2018). Climate change issue is expected to have a devastating impact on global food supplies, leading to a permanent crisis (Dyer, 2011). Rising temperatures will disrupt ecosystems, causing unpredictable weather patterns, storms, floods, and rising sea levels (Bebbington and Larrinaga-Gonzalez, 2008; Khalfaoui et al., 2022). Further, corporates, heavily reliant on fossil fuels, is a significant contributor to global warming and climate change (UNEP and UNFCC, 2002). The COVID-19 pandemic has revealed corporations' lack of readiness for pervasive global risks. The devastating impact of the pandemic implies that such risks, and strategies to mitigate them, haven't received enough scrutiny such as climate change risk (Ben-Amar et al., 2022). Climate change's impacts are expected to be more severe and enduring than any pandemic humanity has faced (Abhayawansa & Adams, 2021).

Literature has shown that climate change and pandemics are inextricably connected, as biodiversity loss increases the likelihood of emerging zoonotic infectious diseases in humans (Abhayawansa & Adams, 2021). Climate change and the COVID-19 pandemic have striking similarities. Both issues involve prolonged time lags, result in irreversible consequences, and disproportionately affect the most vulnerable society (Abhayawansa & Adams, 2021; Ben-Amar et al., 2022). Climate change and pandemic risks are also linked in other ways, as both represent physical and transition risks to individuals, corporations, and the global economy as a whole that translated into socioeconomic impacts (Abhayawansa & Adams, 2021; Ben-Amar et al., 2022; Pinner et al,. 2020). Pinner et al. (2020) claim that the COVID 19 pandemic provides a glimpse into the potential consequences of a full-fledged climate change crisis, including simultaneous exogenous shocks to supply and demand, supply chain disruptions, and global transmission and amplification mechanisms.

As corporations can serve as both contributors to and mitigators of GHGs emissions, so they must bear the responsibility for alleviating their detrimental effects on the environment (Li et al., 2018). Consequently, corporates have faced increasing scrutiny from governments, media, and social activists recently to reduce their emissions and compensate for their environmental impact (Ahmad & Hossain, 2015; Depoers et al. 2016). Such as, The IPCC's sixth assessment report that emphasized the vital urgency for lowering carbon emissions to prevent severe climate change risks (Ben-Amar et al., 2022). The Paris Agreement that signed in 2015 and aims to limit the global temperature rise to 2°C and further limit it to 1.5°C above pre-industrial levels. The global average temperature has surged by 1.2°C above pre-industrial levels, a pressing issue

addressed at the 2021 Leader Summit on Climate. (United Nations Framework Convention on Climate Change, 2015).

Researchers are concerned that, given the global industry's heavy reliance on fossil fuels for production, the 2°C threshold may soon be exceeded owing to inadequate proactive measures to mitigate climate change risk (Maji & Kalita, 2022). The fervent debate surrounding climate change, both within societal and scientific circles, that consistently highlights the significant corporate role in exacerbating global warming, underscoring the urgent need for sustainable practices and reduced carbon footprints isn't surprising (Hahn et al., 2015). Several governments have established policies, both market-based and non-market-based, to encourage corporations to mitigate greenhouse gas emissions (He et al., 2022). For instance in 2010, commercial and industrial sources in the United States produced three times more CO2 than residential sources, excluding energy generation and transportation, so voluntary initiatives like the Carbon Disclosure Project (CDP) have motivated corporations to disclose their greenhouse gases (GHGs) emissions. Moreover, mandated policies that aim at emissions management or greater transparency have just emerged at the federal level. For instance, all facilities in the United States that produce 25,000 metric tons of CO2 equivalents or more are obligated to disclose their GHGs emissions (U.S. Environmental Protection Agency, 2012). Similarly, in the United Kingdom, all stock-listed corporations must report their GHGs emissions (UK Government, 2013).

Egypt's rapid population growth is exacerbating pressure on the country's natural environment, so for addressing environmental challenges, the government has implemented several initiatives to improve air quality, including the Greater Cairo Air Pollution Management and Climate Change Project. Furthermore, the country has started to tackle waste management, but a growing population necessitates a more environmentally conscious utilization of natural resources in order for transition towards a circular economy (OECD, 2024). Egypt has significantly strengthened its national and international climate change obligations. Egypt's Vision 2030 outlines the country's overall Sustainable Development Strategy, which includes climate change goals. An upgraded version, due in 2023, advocates a whole-of-government strategy regarding the objective of further mainstreaming climate considerations into all policies (OECD, 2024). In 2022, Egypt issued the National Climate Change Strategy 2050, which outlines the country's objectives for climate change mitigation and adaptation. The strategy aims to accelerate Egypt's transition to low-carbon growth and strengthen its climate resilience. Egypt has started the creation of a National Adaptation Strategy (OECD, 2024).

In accordance of international initiatives, Egypt ratified the United Nations Framework Convention on Climate Change (UNFCCC) in 1994. It signed the Kyoto Protocol in 2005 as well as the Paris Agreement in 2017. Egypt presented three national communications to the UNFCCC: 1999, 2010, and 2016, in addition to a biennial report in 2018. The communication, that referred to the disclosure of updated

greenhouse gas (GHG) emissions data, was in progress at the time of publication whereas Egypt has gradually reduced greenhouse gas (GHG) emissions since 2017 (OECD, 2024). Egypt's prominent role in tackling climate change was expanding on the African continent as a result of President El-Sisi's two initiatives at the 21st Climate Change Summit in Paris in 2015, during which Egypt launched the Africa Adaptation Initiative and the African Renewable Energy Initiative (SIS, 2022). In the 26th "UN Climate Change Conference of the Parties (COP26), The President stated that the government supported and funded green initiatives will reach 50% by 2025 and 100% by 2030. Further, He also announced that Egypt has completed the development of Egyptian Climate Change Strategy 2050 and concentrated on green economies and environmentally friendly corporates, which are among Egypt's Vision 2030 goals to assist in the recovery from the sever repercussions of the COVID 19 pandemic. In addition to announcing that Egypt is aware of the challenges which developing countries encounter and assuring that the amount of support they receive determines whether or not they will implement their climate change obligations (SIS, 2022). Egypt's climate pledge received international notice as the host of the 27th Conference of the Parties to the United Nations Framework Convention on Climate Change. COP27 also enhanced awareness in Egypt, accelerating its domestic climate agenda. Regular preparatory debates with more than a dozen ministries assisted in mainstream climate change challenges across industries (OECD, 2024), and boosted ambition, finance, the relationship between efforts to address the effects of climate change and the business community, drive investment in climate action, and develop mechanisms to attract the private sector (SIS , 2022).

The Ministry of Environment intends to draft a new Environment Law that addresses climate action, biodiversity, and pollution control. This suggested modification to the 1994 law, aims to create a unified framework for environmental protection and climate action, supporting Egypt's national and international commitments. Egypt implemented substantial environmental commitments, involving adopting the UN Framework Convention on Climate Change and the Paris Agreement. The country has initiated various initiatives including the National Climate Change Strategy 2050 as well as the Low-Emission Development Strategy. This Law is created to furnish a robust framework to sustain such initiatives and attain Egypt's environmental objectives. Through incorporating numerous stakeholders and carrying out a comprehensive approach for ecological protection, Egypt can assure a long-term future for its population and environment (OECD, 2024). Furthermore, as a participant in the Sustainable Exchange Initiative, the Egyptian Financial Regulatory Authority (FRA) has implemented initiatives to encourage climate change disclosure by corporations listed on the Egyptian Stock Exchange (EGX). A pivot action was the issue of Decree No. 108 in 2021, that demands listed corporations, holding issued capital or net ownership interests of at least 500 million Egyptian pounds to disclose climate change implications' data as asserted by Task Force on Climate-

related Financial Disclosures (TCFD) recommends and submitting climate change data to yearly reports, such demands becoming mandatory for the fiscal year ending December 2022 (SSEI, 2021).

2. Literature Review:

Concerns regarding global warming have prompted corporations to set carbon reduction targets and implement initiatives to reduce emissions (Depoers et al., 2016). Corporations can reap numerous benefits from tracking and disclosing their greenhouse gases (GHGs) emissions like reduction the potential for future corporates' disruption (O'Dwyer and Unerman, 2020). Research has shown a positive correlation between climate-related disclosures and corporate performance (Borghei, 2021; Griffin et al., 2017; He et al., 2022; Matsumura et al., 2014). By adoption proactive climate-related measures, disclosing carbon emissions, and developing climate-friendly products, corporates can enhance their reputation (Hahn et al., 2015).

In addition, the pressures to disclose GHGs emissions contribute in enhancing carbon management, resulting in reduced energy consumption and lower energy costs, that enables corporates to mitigate physical and transition risks (Haque and Deegan, 2010). Physical risks refer to financial losses resulting from severe weather events (e.g., drought, fires, cyclones and flood) and transition risks include regulatory risks, reputational and business model risks that represent the monetary loss imposed on by the revaluation of assets as a result of a sudden changes in laws and regulations for transition to a low-carbon economy (Haque and Deegan, 2010; Monasterolo and De Angelis, 2020; O'Dwyer and Unerman, 2020). It indicates that risks associated with climate change may cause physical damage for corporates' assets, alterations in regulations, as well as shifts in societal norms that impact a corporation's reputation (Khalfaoui et al., 2022). Globally, corporates are shifting towards sustainable practices and climate change disclosure which is crucial for assessing associated risks and predicting future performance, thereby informing investment decisions (Maji and Kalita, 2022). Hence, corporate climate change disclosure supports attaining the dual benefits of sustainability and profitability.

In this context, the urgent necessity for initiatives became increasingly pressing, culminating in the landmark Brundtland Report, also known as "Our Common Future Report," released in 1987 by the World Commission on Environment and Development. This report represents a turning point in the global response to environmental degradation. The report calls to initiatives sparked a series of pivotal developments aimed at mitigating climate change risks and protecting the planet (Pitrakkos & Maroun, 2020). The United Nations Framework Convention on Climate Change (UNFCCC) was established during the 1992 Rio Earth Summit, representing the initial agreement on climate change towards the attainment a consensus on stabilizing greenhouse gases GHG emissions concentrations in the atmosphere without jeopardizing climate models (Pitrakkos & Maroun, 2020), Currently, 197 states have joined this Convention, whose major goal is to avoid 'dangerous' human interference in the climate system (SIS, 2022).

This development was further advanced by the World Business Council on Sustainable Development (WBCSD) in 1995, which led to the establishment of the Global Reporting Initiative (GRI) in 199. The GRI aimed to create guidelines that promote sustainable corporate practices and high-quality reporting upon material Environmental, Social, and Governance (ESG) issues (Mock et al., 2013; Pitrakkos & Maroun, 2020). Meanwhile Kyoto Protocol was established in 1997 (Maji & Kalita, 2022), identified by scholars as the primary driver of corporate strategic shifts (Haque and Deegan, 2010).

Furthermore, The Intergovernmental Panel on Climate Change (IPCC 2007) that asserted that the main cause of climate change ws the emission of greenhouse gases (GHG) including carbon dioxide (CO2) emissions (Alrazi et al., 2016). The Paris Agreement (2015) adopted by world leaders to mitigate climate change risks, whereas for the first time, substantially all countries decided to collaborate to reduce the adverse impacts of climate change and adapt to its repercussions. The agreement's principal goal was to keep global temperature rise well below 2°C above pre-industrial levels, with efforts to restrict it to 1.5°C (SIS, 2022). The Task Force on Climate-related Financial Disclosures (TCFD), initiated in 2015 by the G20's Financial Stability Board (FSB), demonstrating the significance of climate change disclosure (Maji & Kalita,2022). The 2019 Climate Summit was a pivotal moment in the global fight against climate change. At this Summit, world policymakers identified their climate action strategy and targets for the 2020 United Nations Climate Conference, where commitments can be reinforced and strengthened (SIS, 2022). Further, Sustainability Accounting Standards Board (SASB) offers a framework for industry-specific corporations on the climate change disclosure to report on climate-related risks and opportunities (SASB, 2024).

These developments have been triggered by rising stakeholder desire for transparency and disclosure on climate change (Li et al., 2018) over national and international levels (Bhaduri et al., 2016; Biermann et al., 2017). Research in the US context has claimed that stakeholders consider climate risks and green investments following the Paris Agreement (Pham et al., 2023). Consequently, there is a boosting trend to transition towards a zero-carbon economy (Demaria and Rigot, 2020). The United Nations Framework Convention on Climate Change (UNFCCC, 2007) emphasizes the negative impact of climate change on corporate operations and long-term performance, emphasizing the need for stricter disclosure standards. This describes the current initiatives to develop the International Financial Reporting Standards on Climate-Related Disclosures (IFRS S2), requiring corporations to disclose climate change risks and opportunities , and should be implemented in 2024 (Salah & Hassaan, 2024). The growing pressures exerted on corporates to enhance their environmental footprint and transparency has raised stakeholders' awareness of the implications (Xue et al., 2020).

Research has consistently revealed that enhanced environmental initiatives have a better effect on corporate performance (Gatimbu et al., 2018; Hang et al., 2019). A global survey by Amel-Zadeh (2021) demonstrated that stakeholders consider climate change risk a financially material concern, after taking into

consideration regulatory and litigation concerns. Chua et al. (2022), Lin and Wu (2023), Lv and Li (2023), and Sun et al. (2023) discovered that adoption strategies and policies to tackle climate change risks have a significantly positive effect on corporate financial performance in addition to stock market volatility. Hence, these results highlight the necessity for further research on quality of climate change disclosure practices, specifically in emerging markets that are struggling to globalize their economies (Salah & Hassaan, 2024).

Despite corporate climate change disclosure being voluntary in most countries, scholars have raised concerns about its quality (Borghei, 2021; Kolk et al., 2008; Haque and Deegan, 2010; He et al., 2022; Stanny, 2018). Studies have shown that corporate climate change disclosure often lack technical details and focus on the positive aspects of climate change management (Cotter et al., 2011). Moreover, disclosure quality has not improved significantly, and regulation is needed to standardize the practice (Comyns and Figge, 2015). While numerous studies have examined the impact of environmental disclosure, facilitated by various guidelines and frameworks, relatively few have focused on the specific implications of climate change (Amar et al., 2020). Even so, Khalfaoui et al. (2022) asserted that stakeholders face challenges in evaluating climate change implications due to a lack of climate change disclosure. In contrast, a study on German DAX30 corporates revealed that corporations may employ climate change disclosure symbolically to improve their reputation and gain legitimacy (Braasch and Velte, 2023). Hence, climate change disclosure has been criticized for generating inconsistent and unreliable information (Haslam et al., 2014). Although, the disclosure tends to be overly broad and flexible, so this necessitates further refinement to provide meaningful and consistent information (Kumar and Prakash, 2019).

The voluntary nature of climate change disclosure leads to methodological heterogeneity, resulting in incomparable data and undermining the usefulness of the information (Ahmad & Hossain, 2015). This constraint may result in information gap while estimating climate change threats (Demaria and Rigot, 2020). Mandatory regulation may be necessary to address this issue (Andrew and Cortese, 2011). The concerns about the quality and reliability of voluntary climate change disclosure resonate with critiques of sustainability accounting and disclosure (He et al., 2022). Studies by Rankin et al. (2011) and Comyns (2016) revealed a significant positive correlation between climate change disclosure and the adoption of Global Reporting Initiative (GRI) guidelines. Furthermore, adhering to GRI guidelines enhanced the quality, extent, and credibility of climate change disclosures.

The concept of carbon accounting originated from the European Union's (EU) Emissions Trading Scheme (ETS) and the Kyoto Protocol (He et al. 2022). Further, the Task Force on Climate Related Financial Disclosures (TCFD) recommendations in 2017 (TFCD, 2023) have prompted regulators, policy makers, and stakeholders to consider climate change repercussions within corporate reports (O'Dwyer and Unerman, 2020; Chua et al., 2022; Cosma et al., 2022; Braasch and Velte, 2023). In response, corporates are

acknowledging the importance of addressing climate change and global warming with in their corporate strategies (Maama and Gani, 2022). Prior research has often employed legitimacy theory to explain the driving force behind voluntary climate change disclosure. This theory posits that corporations mitigate social pressures by voluntarily disclosing greenhouse gas (GHG) emissions information ((Hahn et al., 2015; Hummel & Schlick, 2016; Suchman, 1995). To maintain a positive public image, companies must not only fulfill their environmental responsibilities but also communicate their concerns and actions to stakeholders through various channels, such as Annual or sustainability reports. On the other hand, failing to meet these demands and satisfy stakeholders' expectations may damage a corporate's reputation and legitimacy (Cotter and Najah, 2012; Deegan & Rankin, 1996; Hrasky, 2011; Prado-Lorenzo and GarcaSánchez, 2010; Qian & Schaltegger, 2017). Corporations can enhance their legitimacy and sustainability prospects by acting in a socially acceptable manner, thereby benefiting from responding to institutional pressure (Suchman, 1995). A key aspect of legitimacy and institutional theories is the emphasis on the quality of disclosure. High-quality climate change disclosures are characterized by compliance with consistent procedures, comprehensive information, and transparent assumptions. Furthermore, corporations' responses to institutional pressure are often benchmarked against the disclosures of their competitors within the same industry, or alternatively, against routine regulatory requirements (Cormier et al., 2005).

Although there is no consensus on the extent and manner of climate change disclosure, the COVID-19 pandemic has emphasized the importance of climate change risks management and reporting. This presents an opportunity to reassess gaps in corporate risk reporting related to pervasive global threats (Abhayawansa & Adams, 2021). In May 2020, a trustee of the International Financial Reporting Standards (IFRS) Foundation emphasized the significance for the IFRS Foundation to contribute in developing globally comparable international standards for sustainable reporting, specifically, climate change disclosure (Abhayawansa & Adams, 2021). The Taskforce on Climate-related Financial Disclosures (TCFD) recommendations had previously highlighted the necessity for increased climate change accounting considerations in financial disclosures (TCFD, 2017). It can be argued that the IFRS has been sluggish to realize the necessity and review essential standards accordingly. However, various initiatives and publications have sought to provide input and guidance (Association of Chartered Certified Accountants and Carbon Tracker, 2013).

Egypt is highly vulnerable to sustainability-related challenges, specifically those concerned climate change repercussions, which are of global concern (Salah & Hassaan, 2024). Egypt has adopted significant initiatives to enhance its climate change performance including submitting it’s nationally Contribution for the first time in 2022; hosting COP27 and establishing a strategic partnership with the European Union on climate finance and adaptation (CCPI, 2023). Egyptian institutions are exposed for growing pressure from policy makers and stakeholders to identify, evaluate, and mitigate climate change risks. These risks arise

from policy and market alteration towards green economic models, in addition to physical risks like water stress, food shortage, and precipitation variations (Megeid, 2024). Climate change risk disclosure in Egypt is currently nascent (Megeid, 2024; O'Dwyer and Unerman, 2020). A 2022 International Finance Corporation study asserted that only 10% of Egyptian corporations disclose climate change risk information in their annual reports, below the global average of 20% (Megeid, 2024).

As reporting on climate-related risks enables corporates to recognize the challenges they confront and adapt to climate change, limiting the potential for future corporate disruptions (O'Dwyer and Unerman, 2020). Hence, enhancing the quality of climate change disclosure during the pandemic era, particularly in vulnerable carbon-intensive sectors, may assist corporations to maintain stakeholder trust and positively influence investor perceptions of their resilience to future shocks (Ben-Amar et al., 2022). Prior research has utilized socio political theories (e.g. institutional theory, legitimacy theory) to examine how climate change disclosure is influenced by institutional pressures and asserted that these pressures contribute to country-level variations in corporate climate change disclosures (Anugerah et al., 2018; Bedi& Singh, 2024; Chu et al., 2013; Comyns, 2016; Cormier et al., 2005; Faisal et al., 2018; Garzón-Jiménez& Zorio-Grima, 2021; Hrasky, 2011; Kolk et al., 2008; Liesen et al., 2015; Rankin et al., 2011; Zhang& Liu, 2020).

Recent studies indicate that the COVID-19 pandemic has triggered country-level institutional changes, including regulatory and policy shifts and these changes are likely to have significant implications for climate change progressive (Hepburn et al., 2020). The pandemic can weaken or strengthen institutional pressures over climate change initiatives and disclosure. However, it could also present an opportunity for governments and corporates to accelerate actions towards climate change (Ben-Amar et al., 2022). In developing countries, governments encounter significant challenges in managing the economic consequences of the pandemic, which can undermine investment in climate change mitigation and adaptation, potentially weakening pre-pandemic climate commitments (Reilly et al., 2021). In contrast, developed economies have responded to the pandemic with more substantial recovery funding. The design and conditions of stimulus packages have created institutional pressure for climate change risk reporting (Ben-Amar et al., 2022).

Could the COVID-19 pandemic and the pressing need to address global warming prompt policy makers and corporates to focus more on climate change risks and transparency to enhance the quality of climate change disclosure? Consequently, this research seeks to answer the following questions.

1- What are the Egyptian corporations' Climate Change reporting practices in pre and during COVID 19?

2- What are the Egyptian corporations' Climate Change reporting strategies in response to COVID 19 crisis?

3. Theoretical framework:

3.1. Explanatory theories of voluntary climate change disclosure:

Prior literature demonstrated the significant role of political motivations in driving the adoption of Corporate Social Responsibility (CSR) practices, and utilization CSR strategies for proactively managing regulatory risks. In this context, corporations engage in self-regulation to mitigate the risk of future regulatory action. When the risk of regulatory action is high, and the cost of self-regulation is relatively low, corporations are more likely to adopt socially responsible practices. Furthermore, Corporations employ CSR initiatives to foster good relationships with regulators and policymakers, gain preferential treatment, and influence regulatory decisions. This strategic policy, especially regarding greenhouse gas emissions regulation, may demonstrate social responsibility while still gaining a competitive advantage (Toukabri & Mohamed Youssef, 2023).

Hahn et al. (2015) adopted sociopolitical and institutional theories to explain how corporations voluntarily disclose their greenhouse gas (GHG) emissions information in response to societal expectations and stakeholders pressures in the context of sociopolitical theories, and how corporations conform to industry norms in the context of institutional theory. Similarly, Clarkson et al. (2008) claimed that sociopolitical theory highlighted corporate initiatives concerning climate change issue as stakeholder theory emphasized the significance of considering the interests and expectations of various stakeholder groups while legitimacy theory asserted that corporations must maintain social legitimacy by acting in a socially responsible manner (Patten, 1992; Sethi, 1979).

In this sense, various stakeholders and policy makers exerted pressures on corporations to disclose GHGs emissions information and corporates managers responded to these pressures throughout voluntary climate change disclosure. Consequently, stakeholders play a crucial role in development corporates' strategies and practices. According to Conceição et al. (2012), stakeholders actively seek for social and environmental information more than financial information to evaluate how corporations achieve their strategical goals, utilize social resources and adhere to ethical principles, which is essential for maintaining legitimacy. The theory of legitimacy further emphasized that corporations have a social contract to practice socially attractive initiatives that align with their commercial objectives (Giannarakis et al., 2017).

The voluntary disclosure of environmental information is a vital managerial technique that assist corporations to communicate their commitment to social responsibility and maintain their social contract so, it is crucial for explaining the concept of organizational legitimacy (Hahn et al., 2015). This concept is based on the argument that corporations operate within a socially constructed system of norms, values, and beliefs, and that their actions are perceived as desirable, proper, or appropriate within this system (Suchman, 1995). Further, corporation can gain legitimacy and necessary privileges to support their activities

throughout respecting norms and standards of operating environment, so corporations must strive for adoption distinctive strategies for justify their actions and practices to society and stakeholders and demonstrate their commitment in regards to environmental and social responsibility (Yaghmaei, 2018). Corporations rely on societal support for their existence, continuity, and growth, and in exchange, they are anticipated to achieve socially desirable targets in a socially acceptable manner. Failure to meet these expectations may result in a legitimacy gap, which may emerge from alteration in corporate operations, changing societal expectations, or a combination of both (Sethi, 1979). legitimacy gap may arise for a variety of causes such as environmental disasters (e.g. oil spills or nuclear disasters), prosecution for environmental offenses, poor environmental performance, and raised societal awareness of corporate environmental impact so, to resolve a legitimacy gap, corporations must provide environmental information voluntarily in order to retain or maintain legitimacy (Alrazi et al., 2016; Cho and Patten, 2007; Clarkson et al., 2008; Patten, 2002).

Machado and Ott (2015) investigated a sample of Brazilian corporations and asserted that they report their actions and practices in annual reports. Corporations adopted this disclosure as strategic instrument to inform stakeholders about their management style and ecologically responsible results to maintain their social contracts. While Alrazi et al. (2016) claimed that country-level factors can influence environmental disclosures. From a legitimacy theory perspective, corporations adopt voluntary disclosure to enhance their reputation as responsible corporate citizens that adhere to societal norms. However, these norms vary across countries, with some societies placing greater emphasis on environmental protection. As a result, corporations operating in countries with strong environmental commitments are more likely to disclose environmental information to demonstrate their alignment with these values. This implies that country-level factors, such as environmental regulations, cultural values, and societal expectations, may affect corporate's environmental disclosure practices. The disclosure of environmental information, particularly climate change-related information, is a means for corporations to demonstrate their social and environmental commitments and legitimize their initiatives in front to regulators, policymakers, and stakeholders. A strong governance structure can boost climate change disclosures, enabling corporations to enhance transparency and accountability (Toukabri & Mohamed Youssef, 2023).

Climate change risks is gaining scrutiny from society and policy makers and is subject to various regulations which contributed in making disclosure of climate change-related information unique among environmental disclosures (Luo, 2019). Climate change policies and regulations impose significant pressures on corporations, necessitating responses through climate change disclosure (Alrazi et al., 2016; De Villiers and Alexander, 2014). Institutional theory provides insight into how corporations adopted the strategies and carbon accounting to gain legitimacy (Alrazi et al., 2016; De Villiers and Alexander, 2014). Institutional theory posits that corporations interact with their institutional environment to gain legitimacy. This

perspective claims that corporate policies and practices are influenced by the institutional context, aligning with societal rules and norms. Hence, corporations must adopt practices from a limited range of legitimate options (DiMaggio & Powell, 1991).

As a means to gain legitimacy throughout the process of isomorphism, corporations that are subject to similar institutional pressures tend to adopt same structures and strategies. There are three primary types of isomorphism: normative (arising from professionalization where standards and regulations have been established by institutional participants), mimetic (copying the strategies of other corporations in uncertain times), and coercive (formal pressures like government regulation as well as informal pressures associated to cultural expectations) (DiMaggio and Powell, 1983). Diverse institutional pressures within different countries may affect reporting strategies and account for variations in corporate climate change disclosures over the country level (Comyns, 2016, 2018; Hahn et al., 2015).Although normative pressures, including reporting regulations (Rankin et al., 2011), as well as mimetic pressures, may articulate the convergence of reporting strategies , coercive pressures undermine these trends. Coercive pressures may assist to explain country-level heterogeneity in reporting process (Ben-Amar et al., 2022).

The threat of more stringent laws and regulations influences corporations to disclose climate change information so governments have a crucial role in encouraging corporations to report on climate change. Prior research demonstrated that regulated emissions trading schemes and carbon disclosure project have a favorable impact on greenhouse gas emissions disclosure (Comyns, 2016).

Ben-Amar et al. (2022); Kim and Wolinsky-Nahmias (2014) recognized that corporations in countries where climate change risk is a significant concern are more inclined to be exposed to informal pressures include public attitude toward climate change and vulnerability to climate risk for providing information on it, alongside formal coercive pressures and political differences. Corporations located in countries where climate change issue is a major concern encounter greater public pressure to adopt initiatives for tackling this risk. Research has asserted that climate change vulnerability is associated with higher public support for climate change key management strategies and a greater willingness to pay for such strategies (Kim and Wolinsky-Nahmias, 2014). According to a recent UNDP and University of Oxford (2021) analysis, individuals located Small Island developing states (SIDS), which are most susceptible to climate change risk, strongly support climate change initiatives. This support was even stronger than in high-income countries for initiatives such as investing in green industries and jobs (Ben-Amar et al., 2022). Corporations encountering country-level institutional pressures are going to satisfy stakeholder expectations through strategic responses. Issues can impact institutional circumstances, and country-level response to the COVID 19 pandemic may have increased or decreased pressures for climate-related risk disclosure (Sarkis et al., 2020). Meanwhile, countries suffering from the most severe health and economic repercussions tend to prioritize resuming operations and relieving pressure on affected corporations (Sarkis et al., 2020).

For instance, Donald Trump's presidency marked a significant shift in environmental regulation strategies, particularly concerning the climate change risk. Upon taking office in January 2017, Trump withdrew from the Paris Agreement and revoked several Obama-era regulations aimed at reducing greenhouse gas emissions. Instead, he implemented strategies that supported the growth of fossil fuel industries, indicating a diminished concern for corporate regulations (Antonini et al., 2021). Antonini et al. (2021) claimed that climate change disclosure by corporations evolved very little during Trump's presidency. Interestingly, corporations headquartered in states that supported Trump in the 2016 presidential election had lower levels of climate change disclosure, while those in environmentally sensitive industries had higher levels. In contrast, Joe Biden's presidency brought significant changes to climate change strategies. After taking office in November 2020, Biden rejoined the Paris Agreement in January 2021 and pledged to achieve net-zero greenhouse gas emissions by 2050 (Ben-Amar et al., 2022). Biden also issued executive regulations to combat climate change, including removing carbon-intensive energy subsidies, converting government-owned cars to electric vehicles, and evaluating oil drilling on federal lands. Additionally, Biden's two-trillion-dollar infrastructure strategy, released in March 2021, emphasized the development of renewable energy and sustainable infrastructure (Ben-Amar et al., 2022). These efforts mark a significant departure from Trump's policies and demonstrate a renewed commitment to addressing climate change (Ben-Amar et al., 2022). Consequently, COVID 19 pandemic may strengthen institutional pressures and accelerate initiatives towards transition to low carbon economy, increasing stakeholders' appetite for high-quality climate change disclosure.

4. Research Design and Methodology:

This research utilized content analysis to systematically gather and categorize disclosures, facilitating the extraction of quantitative inferences from the textual data. Content analysis provides a more nuanced understanding of environmental reporting by content extracting and the data analyzing and commenting upon. This approach facilitates a more detailed analysis of corporate environmental disclosures (Demaria and Rigot, 2021; De Villiers & Van Staden, 2006; Guthrie & Parker, 1990; Maji and Kalita, 2022; Ooi and Amran, 2018; Raimo et al., 2022). In line with the methodological approach adopted by De Aguiar & Bebbington (2014) our analysis examined disclosures across multiple dimensions, thereby ensuring a comprehensive understanding of the phenomenon under investigation. The empirical analysis comprised different distinct measures out of which Volume of disclosure by quantifying the number of pages, although the extant literature acknowledges the ongoing debate regarding the most suitable unit of analysis, including number of documents, words, sentences, percentage of pages, and percentage of total disclosure (Guthrie et al., 2008; Unerman, 2000). Gray et al. (1995) utilized the number of pages as a basis for data measurement, citing two primary reasons: pages reflect the relative significance of a topic by identifying the total space allocated to it, and they are easily measured manually. Unerman (2000) further supported this

approach, claiming that measures based on words or sentences overlook non-narrative disclosures, such as graphs and tables, which are prevalent in climate change reporting. For instance in this research, most corporations presented GHGs emissions information using tables or graphics. While number of sentences is a popular measure in the literature (Guthrie & Abeysekera, 2006; Joseph & Taplin, 2011), research asserted that both number of pages and number of sentences yield similar results (Hackston & Milne, 1996) and have significant relationships with disclosure quality measures (Hooks & van Staden, 2011).

There are various media channels where climate change disclosure can be issued. However, as Guthrie et al. (2008) note, examining all possible media types in a single study would be impractical. Therefore, they recommend selecting a manageable number of media types that can effectively address the research question. This research is interested in analyzing climate change disclosure in annual reports and standalone reports for several reasons. Annual reports are a popular source for capturing corporate disclosure due to their regular production (Gray et al., 1995a; Guthrie et al., 2008). However, relying solely on annual reports may not provide a comprehensive picture of corporations' disclosure practices (Unerman, 2000). So, to address this limitation, standalone reports will be analyzed to complement the annual report data. Indeed, recent research on climate change disclosure has focused on analyzing annual and standalone reports (Cowan & Deegan, 2011; De Aguiar & Bebbington, 2014; Haque & Deegan, 2010). This approach is supported by literature highlighting the value of comparative studies examining disclosure in these two types of reports. Annual reports can be seen as representing corporations' "financial" image, while standalone reports reflect their "social and environmental" image (Unerman, 2000). Both report types contain corporate disclosure, but they may exhibit different patterns and cater to distinct stakeholder audiences, constituting different disclosure media. This distinction emphasizes the significance of reviewing both annual and standalone reports to gain a comprehensive understanding of corporations' climate change disclosure practices. Thus, this research measures climate change disclosure throughout implementation of content analysis of the annual and standalone reports of corporations listed in the Egyptian Stock Exchange market, this research attempts to highlight how the quality of climate change disclosure may evolve in response to global issues.

The UNEP/Sustainability reporting guidelines (1996) underscore the significance of high-quality reporting in environmental sustainability. According to these guidelines, effective reporting is characterized by clear descriptions of substantial environmental effects, performance metrics against specific targets, explicit connections between organizational activities and key environmental issues, and evidence of stakeholder engagement. Such comprehensive reporting reflects an organization's awareness of its environmental footprint, commitment to social responsibility, business transparency, and management's dedication to reducing environmental impacts. By incorporating these elements, organizations can demonstrate their understanding of their environmental impact and showcase their efforts to mitigate it,

ultimately contributing to a more sustainable future. The guidelines suggest that greater information diversity in reporting is indicative of an organization's commitment to environmental sustainability and social responsibility, highlighting the importance of transparent and detailed reporting in promoting accountability and stakeholder trust. Numerous studies have employed the Wiseman-based content analysis index (1982) to assess the extent of environmental disclosure, with a notable focus on polluting industries (Clarkson et al., 2008; Patten, 2002; Wiseman, 1982). Additionally, researchers have utilized various methods, including author-designed questionnaires, content analysis scores, line counts, and ordinal values, to evaluate the discretionary information provided by firms (Clarkson et al., 2008). However, a significant limitation of these studies is the potential disconnect between researcher and stakeholder judgments regarding disclosure quality. Corporations may prioritize disclosures that they perceive as useful to stakeholders, rather than revealing their true carbon performance, which can be challenging for outsiders to observe directly (Clarkson et al., 2008). In an effort to address this limitation, Clarkson et al. (2008) categorized environmental disclosure into "soft" and "hard" types, examining how firms utilize different disclosure types to achieve their objectives. In contrast, Bouten et al. (2011) highlighted that while research has extensively examined the quantity and quality of corporate social responsibility disclosure, there is a need to assess whether such disclosures provide meaningful information. They adopted a more nuanced approach, deconstructing climate change disclosure into detailed items and topics, emphasized that disclosure should focus on actions rather than intentions to effectively discharge accountability. To achieve this, they proposed that corporations should report on various topics, each representing a specific dimension of carbon activities, such as carbon governance, vision and mitigation targets, management approach, and performance indicators.

The literature suggests that high-quality disclosures should include both narrative and numerical information (Hackston & Milne, 1996; Hooks & van Staden, 2011; Unerman, 2000). Consequently, this research adopts a similar framework, capturing climate change disclosure data, targets, actions, impact, governance, and response to COVID 19 pandemic and narrative into categories. These categories are measured by the volume of disclosure (number of words) and are based on steps necessary for implementing greenhouse gas reduction programs. By doing so, we not only investigate whether corporates use overall carbon information to signal their carbon performance but also explore the specific carbon information they employ to achieve their goals. The categories can be used to interpret corporations' disclosure on key components of carbon management, such as targets and actions (De Aguiar & Bebbington, 2014). In this sense, this research aims to evaluate the corporate climate change practices and strategies employed by Egyptian corporations listed in EGX 100 index to defend and legitimize their environmental performance and activities in response to the COVID-19 pandemic issue.

This research adopts a climate change disclosure index based on reports published by Global reporting initiative (GRI), International Financial Reporting Standards (IFRS S2), Intergovernmental Panel on Climate Change (IPCC), Sustainability Accounting Standards Board (SASB), and Task Force on Climate-Related Financial Disclosures (TCFD). The content analysis checklist consists of five climate change disclosure items through taking these reports as a reference to conduct an analysis concerned only climate change practices' information not environmental practices in general that is disclosed in the annual and standalone reports of Egyptian corporations listed in the EGX 100 index, and one item to evaluate how climate change disclosure evolves during the COVID-19 pandemic issue. The first stage of the analysis concentrated on capturing the changes in the levels of climate change information disclosed in annual and standalone reports over the period leading up to and during the COVID-19 pandemic issue, i.e. years 2019 through 2022 for Egyptian corporations listed in the EGX 100 index. The analysis indicates that only 24 corporations listed in EGX 100 are inclined to disclose climate change practices' information in various activity sectors involving Automotive, Banking, Chemicals, Commercial services, Construction, Educational services, Electronics, Food and beverages, Managed Healthcare, Metals &Mining, Pharmaceuticals, Textiles and apparel, and Transport. The relevant timeline can be divided in separate periods: (1) 2019 was a 'pre-incident' stage during which corporations weren't exposed for any environmental issue, and served to establish a baseline period for the analysis; (2) the 2020 represented the COVID-19 pandemic issue; (3) the 2021 was subsequent year to the COVID-19 pandemic and deemed beneficial to investigate corporate response to the issue; (4) the 2022 became interesting as, at that time, corporations were already under high scrutiny. The resulting coding scheme is presented in Appendix A, and the quantitative content analysis is based on words count to classify climate change disclosure information into disclosure topics. The result is a comprehensive picture of the corporate legitimation process in response to the COVID-19 pandemic issue.

This research focuses on analyzing information related to the climate change disclosure's content analysis checklist in 89 reports issued by corporations listed on the EGX100 from 2019 to 2020, including 28 annual reports and 61 standalone reports, divided into 43 sustainability reports, 13 carbon footprint reports, two reports related Task Force on Climate Financial Disclosure (TCFD), and one report related to Net Zero Banking Alliance (NZBA) that highlights Bank's commitment to reducing greenhouse gas emissions and transitioning to a low-carbon economy. Before analyzing the reports, it was noted that there is a rising in corporate awareness concerning climate change disclosure over the years with investors increasingly demanding actions and transparency on climate change-related issues. To satisfy this demand, corporations are providing more narrative reporting on climate change, but often struggle to clearly outline their strategies for achieving targets like "net zero" emissions. Furthermore, The Egyptian government recognizes the importance of climate disclosure, with the Financial Regulatory Authority (FRA) requiring listed non-

financial institutions to include climate-related data in their annual financial statements starting in 2023 (Megeid, 2024). These developments explain the increase in the number of reports containing climate change information over the years (see: Table 1), whereas year 2022 is the year that witnessed a great interest from corporations towards climate change tackling initiatives and the disclosure about these initiatives. However, further efforts are needed to promote climate-related disclosure, including making it mandatory for all corporations and providing financial and technical assistance. By enhancing climate-related disclosure, Egyptian corporations can mitigate financial risks and contribute to the sustainability of the economy. Gray et al. (1995) claimed that annual reports are a means for corporations to construct their own narrative and present a financial image. This might lead to potential conflicts between social and environmental disclosures and corporate financial goals in annual reports. But, De Aguiar and Bebbington (2014) asserted that corporations are increasingly disclosing information about climate change in their annual reports. In contrast, this research concludes that corporations listed in EGX100 are more inclined to disclose climate change information within standalone reports in response to the Task Force on Climate-related Financial Disclosures (TCFD) recommendations.

Table 1

Number of reports that presented disclosure on climate change by year.

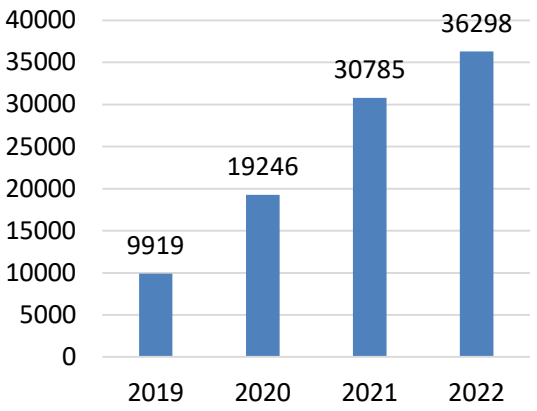
	2019	**2020**	**2021**	**2022**	**Total**
Participants—Standalone	10	13	17	21	61
Participants—Annual Report	4	6	7	11	28
Total	14	19	24	32	89

5. Results and Analysis:

5.1. Emissions level disclosure by Industry

Figure (1) and Table (2) illustrate that the disclosure of overall emissions level has an increasing trend throughout the study period from 2019 to 2022. Disclosures increased by 266%, from 9,919 in 2019 to 36,298 in 2022, reflecting an increased focus on emissions disclosure.

Figure. (1) Disclosure of emissions level

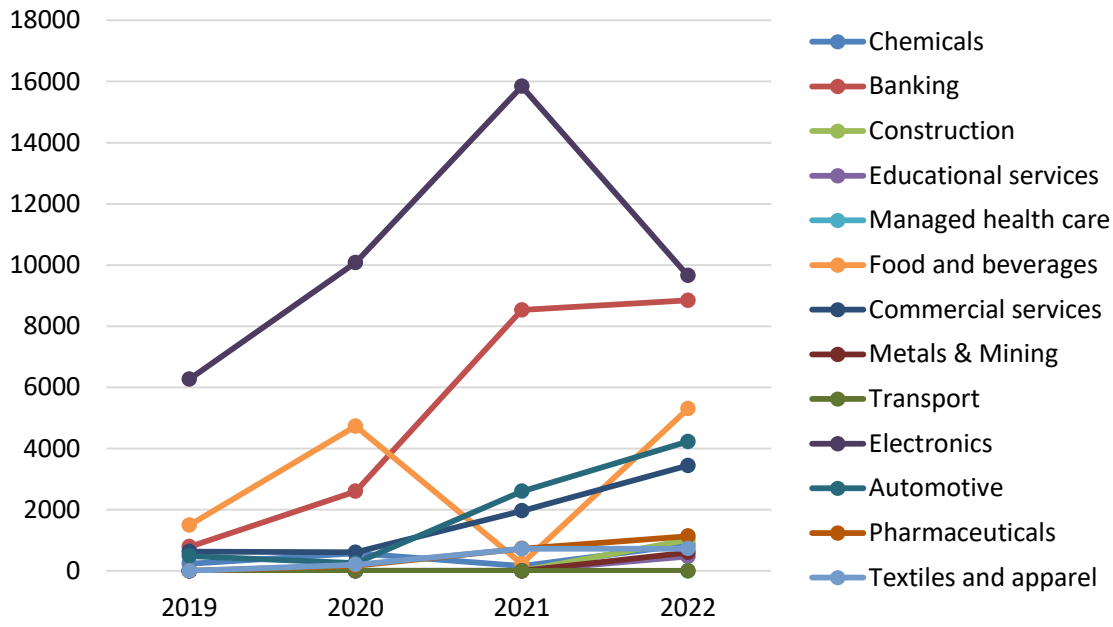


	2019	2020	2021	2022
Chemicals	240	580	165	862
Banking	791	2604	8530	8842
Construction	0	0	0	1021
Educational services	0	0	0	471
Managed health care	0	0	0	0
Food and beverages	1497	4732	237	5303
Commercial services	633	609	1962	3444
Metals & Mining	0	0	0	604
Transport	0	0	0	0
Electronics	6271	10080	15840	9656
Automotive	487	261	2600	4231
Pharmaceuticals	0	172	729	1136
Textiles and apparel	0	208	722	728
Total	9919	19246	30785	36298

Table (2). Disclosure of emissions level by industry

Table (2) and Figure (2) illustrate that the electronics sector has the highest-emissions level disclosure and that both managed health care and transport sectors have no emissions disclosure level.

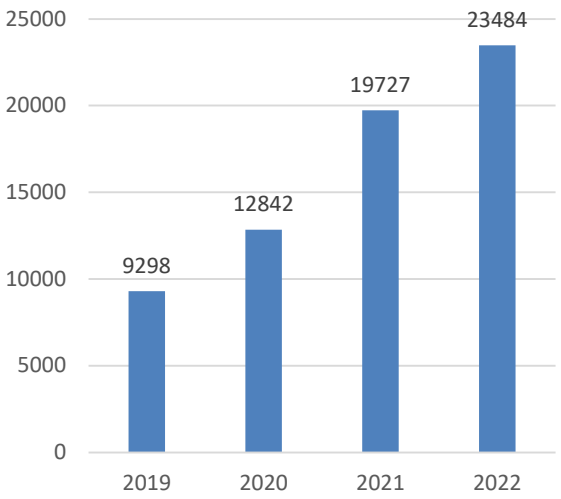
Figure (2). Disclosure of emissions level by industry



5.2. Energy disclosure by Industry

Figure (3) and Table (3) illustrate that the disclosure of overall energy followed an upward trend throughout the study period from 2019 to 2022.

Figure (3). Disclosure of energy

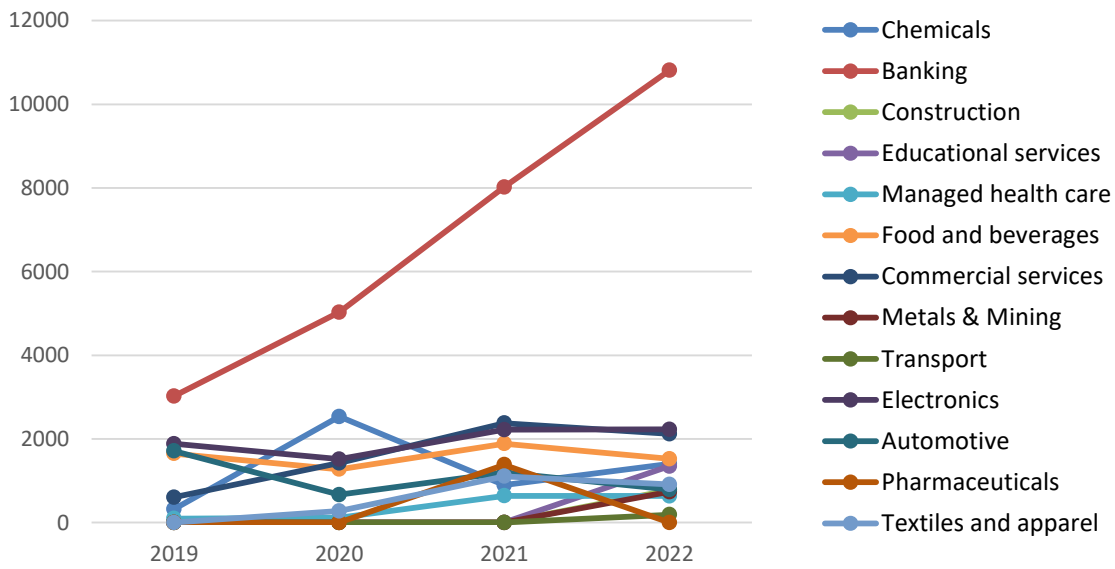


	2019	2020	2021	2022
Chemicals	322	2535	896	1404
Banking	3025	5028	8021	10811
Construction	0	0	0	779
Educational services	0	0	0	1348
Managed health care	99	115	641	638
Food and beverages	1651	1275	1886	1526
Commercial services	605	1426	2378	2121
Metals & Mining	0	0	0	737
Transport	0	0	0	191
Electronics	1884	1517	2220	2228
Automotive	1712	669	1196	788
Pharmaceuticals	0	0	1381	0
Textiles and apparel	0	277	1108	913
Total	9298	12842	19727	23484

Table (3). Disclosure of energy by industry

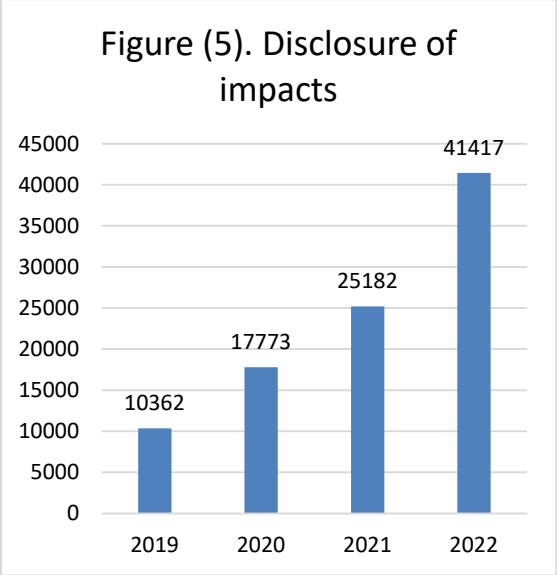
Table (3) and Figure (4) illustrate that the banking sector has the highest level of energy disclosure and followed an upward trend, and the transport sector has the lowest level of energy disclosure.

Figure (4). Disclosure of energy by industry



5.3. Impacts disclosure by Industry

Figure (5) and Table (4) illustrate that the disclosure of overall impacts followed an upward trend throughout the study period from 2019 to 2022.

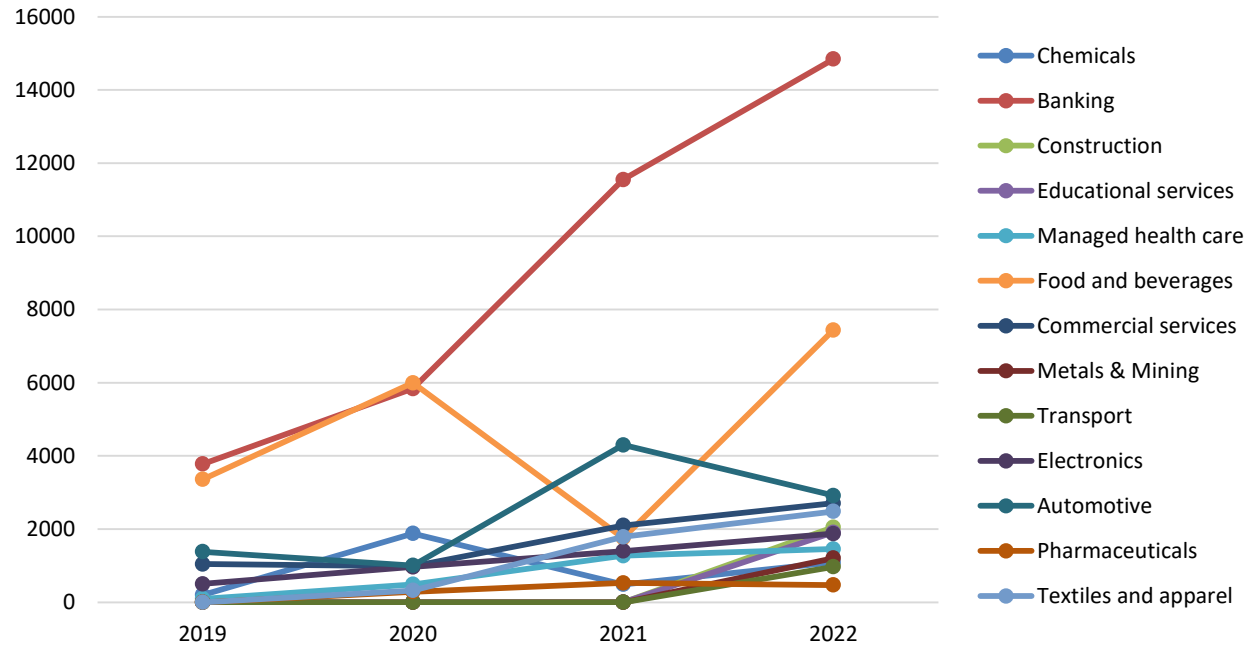


	2019	2020	2021	2022
Chemicals	200	1880	489	1090
Banking	3779	5837	11550	14842
Construction	0	0	0	2051
Educational services	0	0	0	1912
Managed health care	96	491	1272	1456
Food and beverages	3357	5997	1759	7438
Commercial services	1044	985	2098	2706
Metals & Mining	0	0	0	1205
Transport	0	0	0	969
Electronics	504	965	1400	1875
Automotive	1382	1006	4298	2916
Pharmaceuticals	0	289	530	472
Textiles and apparel	0	323	1786	2485
Total	10362	17773	25182	41417

Table (4). Disclosure of impacts by industry

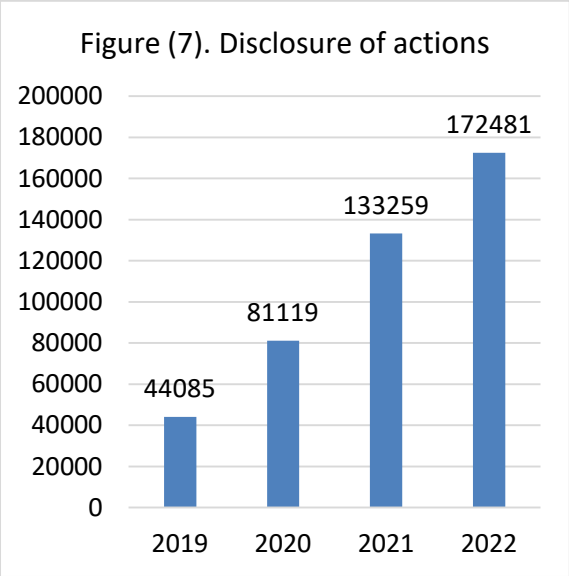
Table (4) and Figure (6) illustrate that the banking sector has the highest level of impacts disclosure, and that (banking, managed health care, electronics, and textiles and apparel) sectors followed an upward trend for impacts disclosure.

Figure (6). Disclosure of impacts by industry



5.4. Actions disclosure by Industry

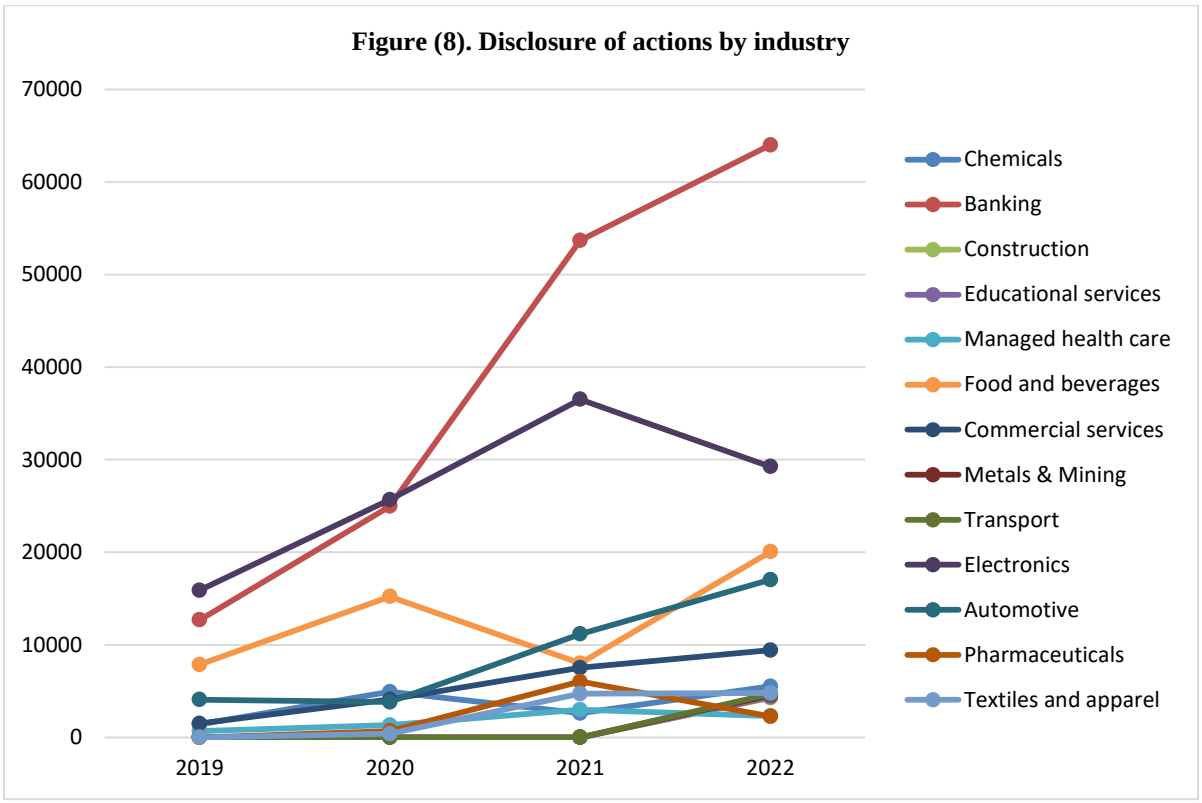
Figure (7) and Table (5) illustrate that the disclosure of overall actions followed an upward trend throughout the study period from 2019 to 2022.



	2019	2020	2021	2022
Chemicals	1402	4933	2606	5509
Banking	12681	24972	53690	63997
Construction	0	0	0	4270
Educational services	0	0	0	4355
Managed health care	671	1329	2986	2314
Food and beverages	7872	15219	8009	20054
Commercial services	1496	4089	7525	9420
Metals & Mining	0	0	0	4554
Transport	0	0	0	4687
Electronics	15883	25673	36522	29246
Automotive	4080	3823	11174	17025
Pharmaceuticals	0	682	6036	2262
Textiles and apparel	0	399	4711	4788
Total	44085	81119	133259	172481

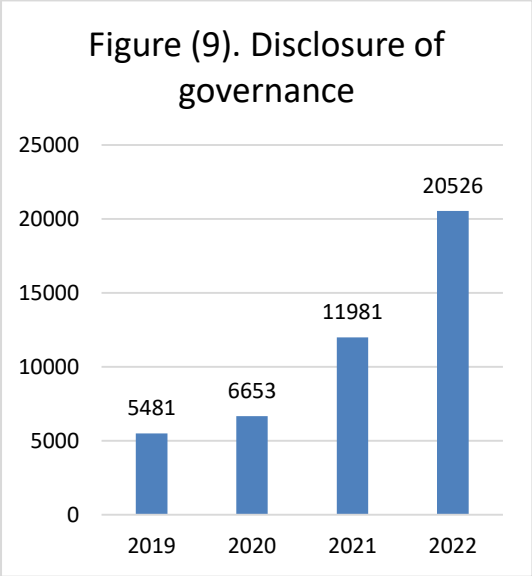
Table (5). Disclosure of actions by industry

Table (5) and Figure (8) illustrate that the banking sector has the highest level of actions' disclosure in (2021 and 2022) and followed an upward trend throughout the study period, and the construction sector has the lowest level of actions' disclosure in 2022.



5.4.1. *Governance disclosure by Industry*

Figure (9) and Table (6) illustrate that the disclosure of overall governance followed an upward trend throughout the study period from 2019 to 2022.

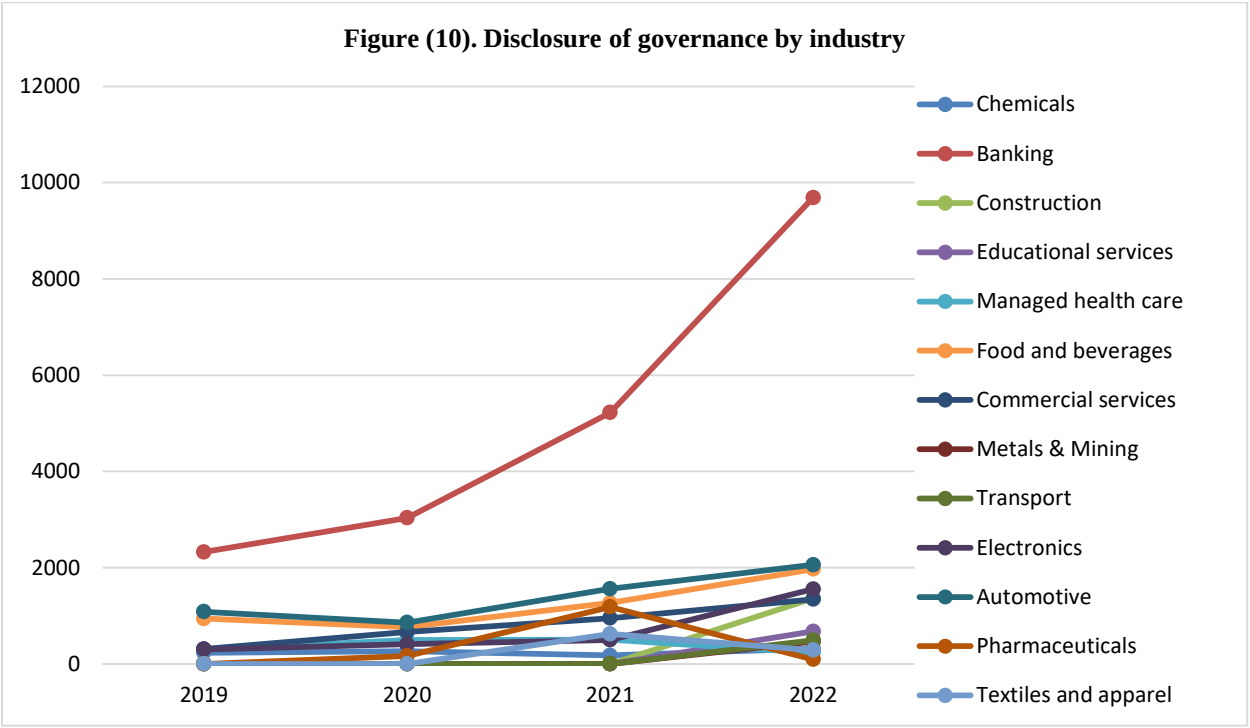


	2019	2020	2021	2022
Chemicals	232	263	175	317
Banking	2325	3034	5221	9687
Construction	0	0	0	1360
Educational services	0	0	0	676
Managed health care	293	497	504	233
Food and beverages	940	762	1267	1968
Commercial services	309	664	950	1342
Metals & Mining	0	0	0	461
Transport	0	0	0	491
Electronics	299	408	498	1554
Automotive	1083	858	1559	2059
Pharmaceuticals	0	167	1184	94
Textiles and apparel	0	0	623	284
Total	5481	6653	11981	20526

Table (6). Disclosure of governance by industry

Table (6) and Figure (10) illustrate that the banking sector has the highest level of governance disclosure, and (banking, commercial services, and electronics) sectors followed an upward trend for governance disclosure.

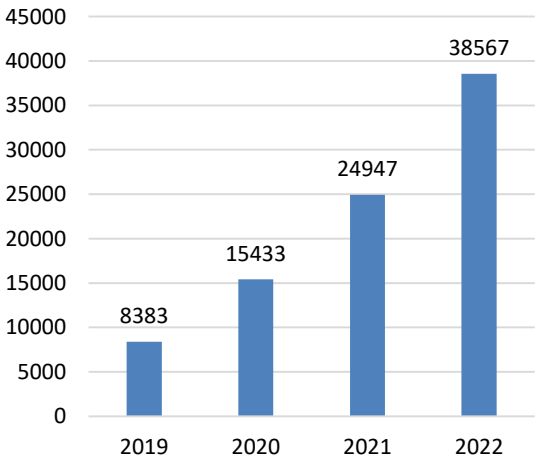
Figure (10). Disclosure of governance by industry



5.4.2. Policies, Strategies/ Management actions disclosure by Industry

Figure (11) and Table (7) illustrate that the disclosure of overall policies, strategies and management actions followed an upward trend throughout the study period from 2019 to 2022.

Figure (11). Disclosure of policies, strategies / management actions

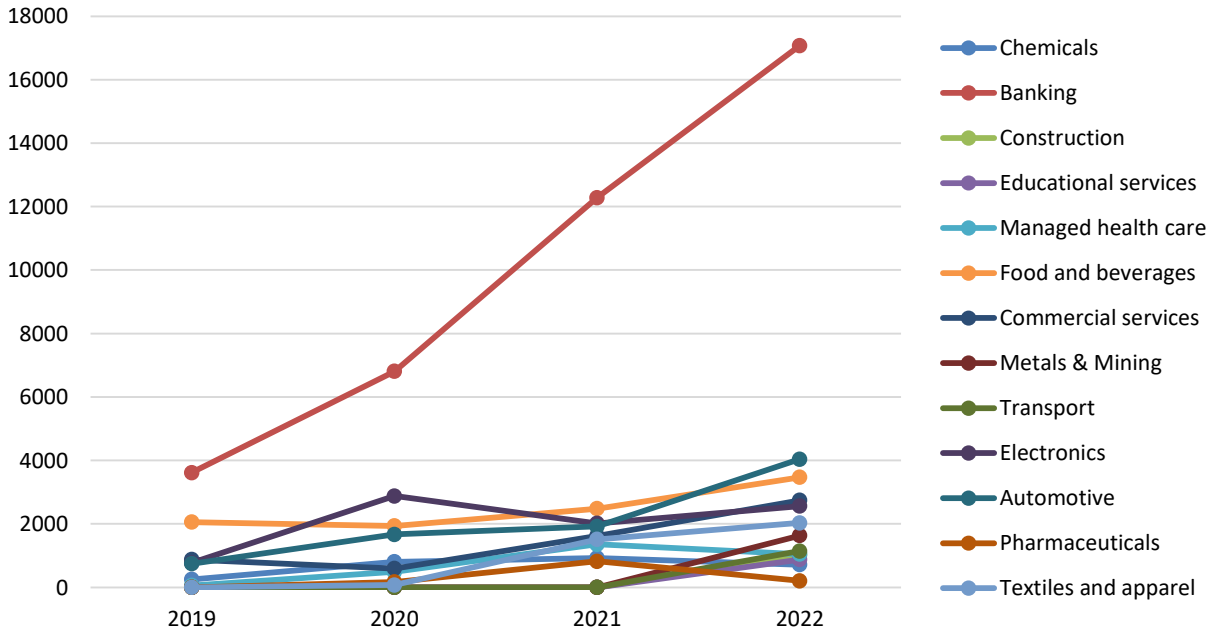


	2019	2020	2021	2022
Chemicals	254	804	927	717
Banking	3618	6808	12282	17076
Construction	0	0	0	1021
Educational services	0	0	0	877
Managed health care	60	491	1356	1050
Food and beverages	2058	1936	2481	3469
Commercial services	875	593	1624	2744
Metals & Mining	0	0	0	1632
Transport	0	0	0	1144
Electronics	771	2882	2016	2562
Automotive	747	1671	1922	4038
Pharmaceuticals	0	172	824	205
Textiles and apparel	0	76	1515	2032
Total	8383	15433	24947	38567

Table (7). Disclosure of policies, strategies / management actions by industry

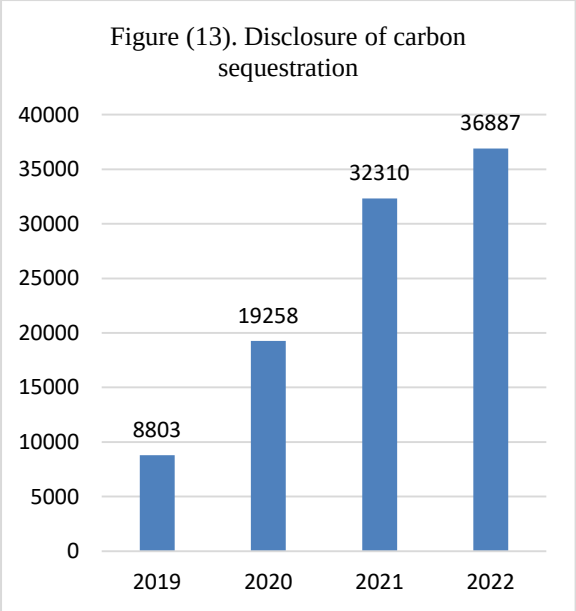
Table (7) and Figure (12) illustrate that the banking sector has the highest level of policies, strategies and management actions disclosure, (banking, automotive, and textiles and apparel) sectors followed an upward trend, and that (food and beverages and commercial services) sectors decreased in 2020, then followed an upward trend.

Figure (12). Disclosure of policies, strategies / management actions by industry



5.4.3. *Carbon sequestration disclosure by Industry*

Figure (13) and Table (8) illustrate that the disclosure of overall carbon sequestration followed an upward trend throughout the study period from 2019 to 2022.

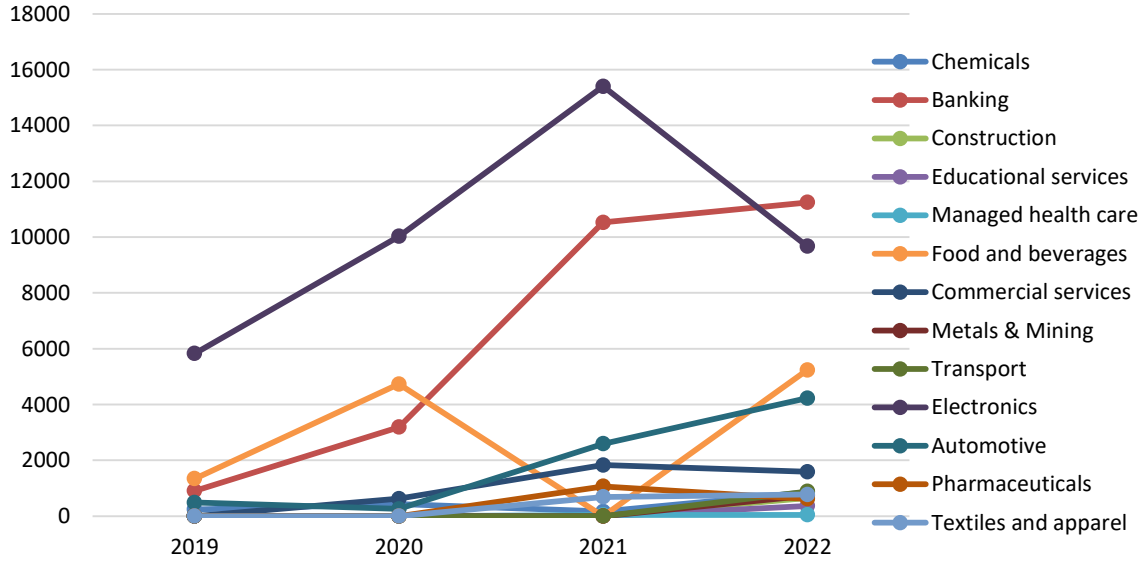


	2019	2020	2021	2022
Chemicals	240	429	165	862
Banking	908	3188	10523	11240
Construction	0	0	0	649
Educational services	0	0	0	365
Managed health care	0	0	47	47
Food and beverages	1339	4732	0	5238
Commercial services	0	624	1830	1586
Metals & Mining	0	0	0	731
Transport	0	0	0	884
Electronics	5829	10025	15399	9670
Automotive	487	260	2591	4226
Pharmaceuticals	0	0	1067	617
Textiles and apparel	0	0	688	772
Total	8803	19258	32310	36887

Table (8). Disclosure of carbon sequestration by industry

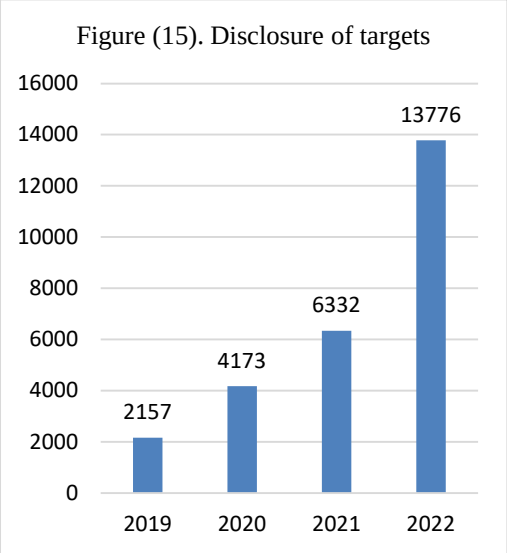
Table (8) and Figure (14) illustrate that the electronics sector has the highest level of carbon sequestration disclosure from 2019 and 2021, but the banking sector has the highest level of carbon sequestration disclosure in 2022 and followed an upward trend throughout the study period, and automotive sectors decreased in 2020, then followed an upward trend.

Figure (14). Disclosure of carbon sequestration by industry



5.5. Targets disclosure by Industry

Figure (15) and Table (9) illustrate that the disclosure of overall targets followed an upward trend throughout the study period from 2019 to 2022.

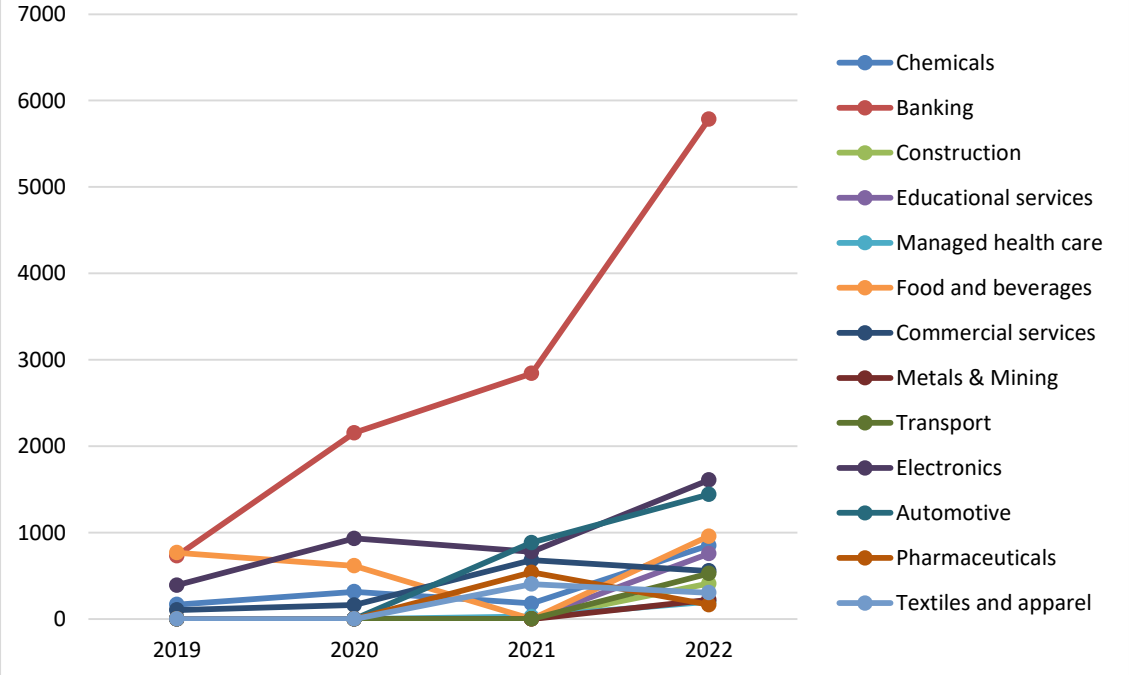


	2019	2020	2021	2022
Chemicals	166	314	180	851
Banking	731	2154	2841	5784
Construction	0	0	0	409
Educational services	0	0	0	755
Managed health care	0	0	28	198
Food and beverages	767	614	0	958
Commercial services	103	160	681	556
Metals & Mining	0	0	0	222
Transport	0	0	0	526
Electronics	390	931	777	1608
Automotive	0	0	883	1441
Pharmaceuticals	0	0	539	165
Textiles and apparel	0	0	403	303
Total	2157	4173	6332	13776

Table (9). Disclosure of targets by industry

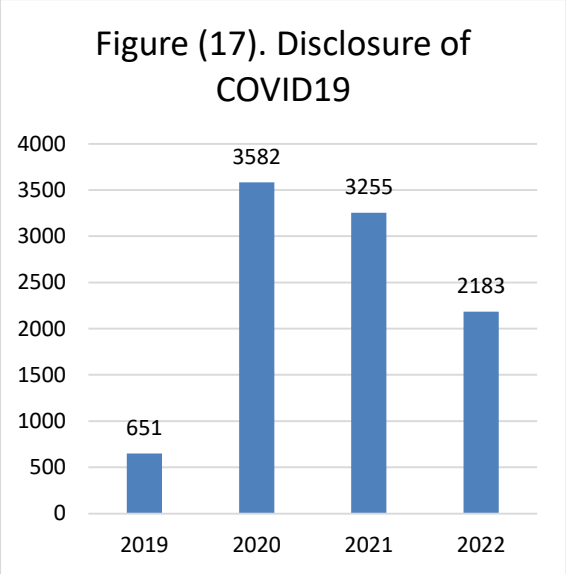
Table (9) and Figure (16) illustrate that the banking sector has the highest level of targets disclosure from 2020 to 2022 and followed an upward trend throughout the study period, and managed health care sector has the lowest level of targets disclosure in 2022.

Figure (16). Disclosure of targets by industry



5.6. *COVID19 disclosure by Industry*

Figure (17) and Table (10) illustrate that the disclosure of overall COVID19 followed an upward trend from 2019 to 2020, and then began to follow a downward trend until 2022. This is likely due to a decrease in pandemic-related disruptions in subsequent years.

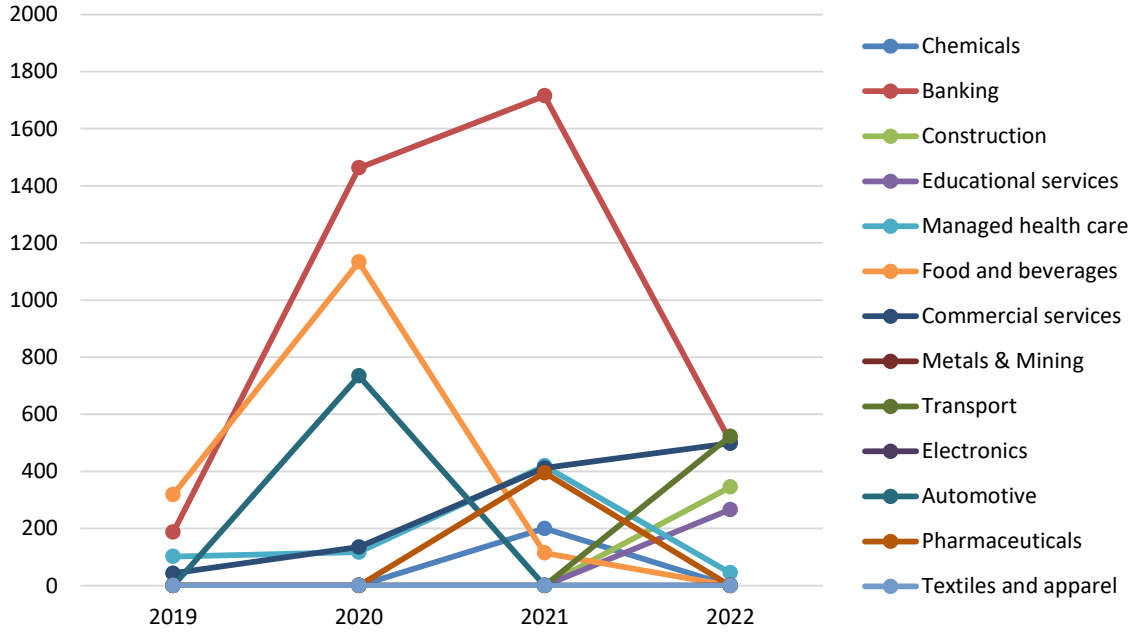


	2019	2020	2021	2022
Chemicals	0	0	200	0
Banking	187	1463	1715	506
Construction	0	0	0	345
Educational services	0	0	0	266
Managed health care	102	117	419	45
Food and beverages	319	1133	114	0
Commercial services	43	135	412	498
Metals & Mining	0	0	0	0
Transport	0	0	0	523
Electronics	0	0	0	0
Automotive	0	734	0	0
Pharmaceuticals	0	0	395	0
Textiles and apparel	0	0	0	0
Total	651	3582	3255	2183

Table (10). Disclosure of COVID19 by industry

Table (10) and Figure (18) illustrate that the banking sector has the highest level of COVID19 disclosure from 2019 to 2021, then it decreased in 2022, the commercial services sector followed an upward trend throughout the study, and that both metals & mining and textiles and apparel sector have no COVID19 disclosure.

Figure (18). Disclosure of COVID19 by industry



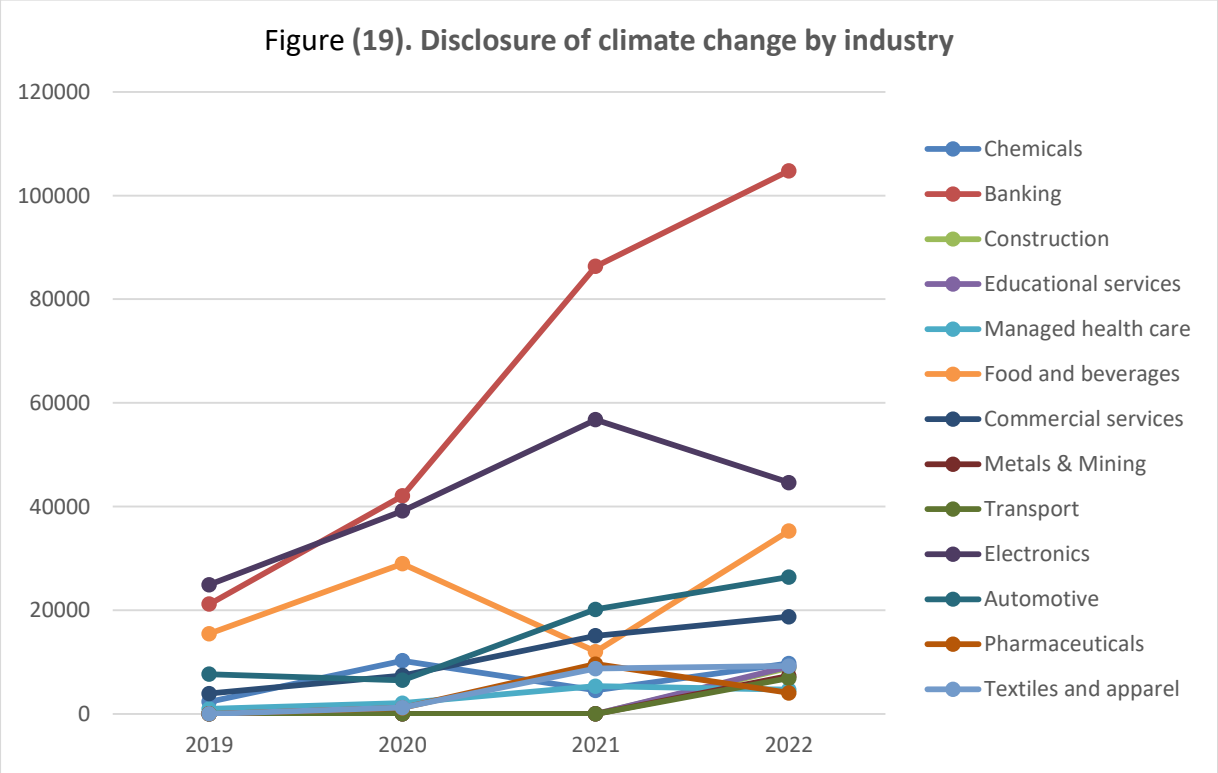
5.7. Climate Change disclosure by Industry

The following table illustrates the climate change disclosure for each sector throughout the study period from 2019 to 2022.

Table (11). Disclosure of climate change by industry

	2019	2020	2021	2022
Chemicals	2330	10242	4536	9716
Banking	21194	42058	86347	104782
Construction	0	0	0	8875
Educational services	0	0	0	9107
Managed health care	968	2052	5346	4651
Food and beverages	15463	28970	12005	35279
Commercial services	3924	7404	15056	18745
Metals & Mining	0	0	0	7322
Transport	0	0	0	6896
Electronics	24932	39166	56759	44613
Automotive	7661	6493	20151	26401
Pharmaceuticals	0	1143	9610	4035
Textiles and apparel	0	1207	8730	9217
Total	76472	138735	218540	289639

Table (11) and Figure (19) illustrate that total disclosures increased by 279% over the period, from 76,472 to 289,639, mirroring the overall trend, which reflects a global shift toward transparency in climate change disclosure. Banking and electronics sectors led this trend, while newer sectors such as construction, educational services, metals & mining, and transport showed rapid adoption in 2022.



6. Conclusion:

There is a significant increase in the quantity of climate change disclosure (see Figure 19) during the COVID-19 period, combined with the shift towards zero carbon strategies and contrasting views of stakeholders, suggest that an incremental need for legitimation strategies appear to exist when corporations encounter a crisis. In Egypt, the increasing of climate change disclosure can be attributed to various factors, including growing public awareness and government pressures, as well as economic benefits such as enhancing corporate reputation and attracting sustainability-conscious investments. Corporations are also driven to manage climate-related risks and capitalize on opportunities in the sustainability market. In accordance of socio-political and institutional theories, Egyptian corporations are motivated to disclose climate change information to gain social and economic legitimacy, ultimately contributing to their long term success and sustainability. Our analysis reveals that social and regulatory cost exposures significantly influence corporate climate change disclosure, with a corporates' local political environment playing a crucial role in shaping its response to these exposures. This supports sociopolitical and institutional theories arguments, yet highlights the need to distinguish between competing effects when social and regulatory exposures diverge, underscoring the complexity of corporate climate change disclosure decisions. However, given the somewhat unique nature of the COVID-19 pandemic, extending examinations to other situations and locales where exposures compete with each other in a politicized environment would appear valuable.

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	Main Category	Sub-category	Description	Source
1	**Emissions**	**Emissions level**	Emissions levels on direct GHG	GRI 305 SASB
2	**Energy**	**Energy**	Energy Consumption, Reduction Of Energy Consumption, Usage Of Renewable Energy, and Energy Efficiency.	GRI 302 SASB
3	**Impacts**	**Impacts**	Describe the current and potential consequences	GRI 3.3 IPCC
4	**Actions**	**Governance**	Describe Governance processes.	TCFD IFRS S2
		Policies, Strategies / Management actions	Describe the policies or commitments aim to mitigate the effects of transition towards a low-carbon economy o	GRI 3.3 SASB IPCC TCFD IFRS S2
		Carbon sequestration	Describes net mass of CO in metric tons	GRI 201
		Additional actions	Continuous Improvement, Supply chain involvement, Engagement with stakeholders, and Performance.	GRI 3.3 SASB TCFD IFRS S2
5	**Targets**	**Metrics & Targets**	Describe the company's metrics and targets	GRI 3.3 SASB TCFD IFRS S2
6	**COVID 19**	**COVID19**	Describe environmental initiatives that are adopted by companies to tackle economic recession due to COVID19 pandemic.	

Appendix A. Climate change Disclosure Index (De Aguiar & Bebbington, 2014).