

REVIEW PAPER

Effectiveness of the voluntary disclosure of corporate information and its commitment to climate change

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ABSTRACT

BACKGROUND AND OBJECTIVES: Although governments and companies have been implementing various measures, such as technological innovation, new emissions regulations, and policies to reduce greenhouse gas emissions, it seems that global warming is not decreasing. In order to reduce greenhouse gas emissions, the commitments of companies were considered to be the key for climate change. However, since the Paris Climate Agreement, there has not been an accurate evaluation of the efforts and contributions of companies toward emission reductions. This study investigated the effectiveness of companies in Climate Action and tested its impact on greenhouse gas emissions at the country and per capita levels.

METHODS: This study focuses on companies of the countries from the main Latin American economies (Mexico, Chile, Brazil, Colombia, and Argentina) and their major trading partners (the United States of America, Canada, China, Korea, Germany, and Japan). There are 894 companies from Latin America and 3680 companies that represent their trading partners of referred countries in Climate Action. This study used two data sources, the commitment of companies from Global Climate Action and the annual greenhouse gas emissions levels of each country from an open-access data platform called Our World in Data.

FINDINGS: The findings demonstrate a significant and positive relationship between changes in greenhouse gas emissions from 2021 and 2020 and the number of companies participating in Global Climate Action (Pearson = .718*, significance = .013) and per capita (Pearson = 0.827** significance = 0.002). Correlations indicate there is a higher level of commitment to climate action but with marginal contributions to greenhouse gas emissions reduction. Previous expectations were that greater corporate involvement in climate action would reflect a link to greenhouse gas reductions, but this was not the case. Additionally, the reduction in greenhouse gas emissions during the pandemic was due to the economic slowdown and was not necessarily because of the climate action efforts of companies and governments to reduce emissions. The findings demonstrated a negative and significant correlation at the country level during the pandemic (Pearson = -0.629 significance = .038). The lack of effective results for reducing (from 2020 and 2021) greenhouse gas emissions justifies the relevance of increasing transparency and accountability for both companies and countries. The acceleration of the production system reflected in an increase in greenhouse gas emissions is not keeping pace with the commitments and the reported achievements on Global Climate Action.

CONCLUSION: This study contributed to justifying efforts for a better way to follow up international efforts to reduce greenhouse gas emissions. Transparency and accountability are key to effectively achieving greenhouse gas reductions and curbing the impending climate crisis.

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INTRODUCTION

The UN has urged action to limit global warming to 1.5°C, with businesses committing to reduce carbon dioxide (CO₂) alongside governments. Approximately 62% of greenhouse gases (GHGs) are CO₂ generated by fossil fuels, 11% is from land use, and 3% is from chemicals (EPA, 2023). The effects of GHGs on the planet are diverse, and alterations are seen in climate factors and in the various life systems on the planet. The United Nations (UN, 2023) notes that high temperatures, severe storms, increased drought, a warming and rising ocean, species loss, insufficient food, greater health risks, and poverty and displacement are expected. According to *Our World in Data* (2023), 73.2% of GHG emissions are due to energy consumption, which involves different industries such as iron and steel, transportation, chemicals, aviation, and others. The UN's action roadmap, the 17 Sustainable Development Goals (SDGs), proposes five targets and eight indicators for reducing, mitigating, and adapting to the climate crisis. One of the important initiatives for developing transparent data on the actions taken by companies. *Global Climate Action* (2023) and *Our World in Data* (2023) are open information portals that monitor and provide open access to data and information on the CO₂ reduction policies of companies. This paper tracks the correlations between the Global Climate Action Commitments of business players and the level of GHG emissions in Latin America (LATAM) economies and their major trading partners. It examines the effectiveness of companies' contribution to reducing GHG emissions by analyzing the commitments of companies to *Global Climate Action* (2023) and GHG emissions per country from *Our World in Data* (2023). There are several platforms that share standards, programs, guides for inventorying and monitoring GHG emissions and actions taken by companies to respond to the climate crisis. The following are some of the important ones, but this is by no means an exhaustive list: 1) World Resources Institute (WRI) develops shared programs focused on solving challenges at the intersection of environmental and human development: Cities, climate, energy, food, forests, ocean, and water (WRI, 2023). 2) World Business Council for Sustainable Development (WBCSD) is a corporate executive officer (CEO)-led community focusing on accelerating the system

transformations needed for a net-zero, natural, positive, and more equitable future (WBCSD, 2023). 3) International Organization for Standardization provides guidance at the organization level for quantification and reporting of GHG emissions and removals (ISO, 2023). 4) The Intergovernmental Panel on Climate Change provides guidelines for national GHG inventories (IPCC, 2023). 5) The Greenhouse Gas Protocol provides GHG accounting standards to measure and manage emissions for GHG inventory (GGP, 2023). It was decided to use the two platforms referred to above because of the ease of comparing countries and companies that are involved in climate action classified by country. Digital platforms, like Global Climate Action, provide important advantages. For example, various global and national stakeholders can observe the performance of the region, the country, a certain sector, or a specific company. The disadvantages of this platform are that it is difficult to compare the impact of efforts from one company to another. It can also be observed that most companies include short-term commitments, whereas the results of climate action require a longer time frame. For instance, making technological changes in a plant to make it more sustainable may require more time than carrying out one-off actions with minimal environmental impact. In addition, to ensure everything reported is comparable, the way in which emissions are measured must be standardized. Despite these limitations, these platforms are valuable with scope of further improvement. Although the decision of companies to participate and share information is voluntary, the legal framework for each country can exert an important coercive effect to comply with regulations. On the contrary, such regulations should be standardized at the international level. In the case of LATAM, because of the platforms such as climate action, it is possible to observe that the tendency practice of sharing climate action initiatives and commitments are lower and exhibit a reduced tendency to report results. This is unlike other countries (trading partners with LATAM), that show a higher level of initiative and commitment and a greater practice of reporting results than its international partners. As part of the corporate information shared by global companies, a sustainability section is increasingly a requirement demanded by stakeholders. However,

it is not enough to share reports on websites. Companies must adjust the information on their sustainability efforts based on global standards to provide comparative evidence of what they are doing (reported or unreported results) and to follow up on them in different timeframes.

Corporate information on climate change contributions is useful to make decisions based on this information for international agreements or trade agreements. This information can also be useful for financial investors and global companies. Companies or countries that are not interested in climate action may represent a risk to invest in them and those showing achievements may attract investment or financing.

The novelty of this study is that it demonstrates how the GHG emissions of a group of LATAM countries and their main international trading partners have not fallen. Increase in GHG emission persists despite the increased corporate participation. Their commitments and progress on climate change have also been increasing. This demonstrates that reducing climate change by reducing greenhouse gas emissions is one of the most challenging efforts for international bodies. The only thing that has been shown to reduce GHGs on the planet is, unfortunately, the pandemic, and not the intentions or commitments of governments and companies. This study aims to investigate the effectiveness of business actors in Climate Action for greenhouse gas emissions reduction at the country level from major Latin American economies and their major trading partners. This study is part of a sustainable research project related to Business and Climate Change at Tecnológico de Monterrey, Monterrey City, Mexico, during 2021 – 2023.

Business involvement in climate change

Organizations are a major source of GHG that is causing global warming (Levine and Steele, 2021). In response, the UN continues to apply pressure on business organizations to reduce CO₂ emissions under the framework of the Paris Climate Agreement (Hu et al., 2017) and the UN's SDGs (Qian et al., 2022) to ensure significant progress in this reduction (Biró and Szalmáné Csete, 2020). Considering that the key to responding to climate change is the reduction in CO₂ emissions (82% of GHG), initiatives

such as the emission trading scheme (ETS) have emerged. ETS is a market-based pollution-control strategy that provides economic incentives to reduce emissions and has the potential to reduce them by establishing a pollution limit and creating a market for each country (Hashim et al., 2022). Under these circumstances, transparency and accountability are essential for these mechanisms to function on the global stage. Moreover, universities have joined the effort to reduce carbon emissions, such as by reducing GHG emissions through compost processed from food and green wastes generated at a university campus, by converting organic wastes into organic fertilizer (Kamyab et al., 2015). Furthermore, Europe has committed to full decarbonization and introduced a cross-border carbon tax, which has prompted companies to respond by implementing governance processes and reducing emissions in their supply and value chains to address climate change (Carpio-Aguilar et al., 2019; Sullivan and Gouldson, 2020). However, criticism of the low standards imposed by countries for their environmental regulations and the occurrence of the free rider syndrome (Maraseni and Reardon-Smith, 2019) relating to emission reduction has emerged. Therefore, several previous studies have examined the effectiveness with which companies in various industries have tackled climate change. In the corporate information shared by global companies, the sustainability section is increasingly a requirement demanded by stakeholders. However, it is not enough to share reports on their websites. Companies must adjust the information on their sustainability efforts based on global standards to provide comparative evidence of what they are doing (reported or unreported results) and strictly follow up on them in different timeframes. The initiative for climate action for companies is mainly adaptation/resilience, mitigation and equally adaptation/resilience, and mitigation. Specifically, the different sections for Climate Action commitments are emission reduction, renewable energy, energy efficiency, adaptation and resilience, and finance. These studies have highlighted the lack of knowledge about the effectiveness of companies' efforts to reduce GHG emissions and the need for more ambitious targets (Hsueh, 2022) and complete reporting. For instance, studies share findings about

how adaptation strategies could help lessen vulnerability to climate change (Biró and Szalmáné Csete, 2020), shareholder protection (Giesekam *et al.*, 2021), decarbonizing of transportation sector (Gota *et al.*, 2019), innovative technologies for reductions in carbon emissions (Levine and Steele, 2021), and climate change and oil companies (Roginko, 2021). In addition, companies sought to respond through governance processes and took steps to reduce their emissions in their supply and value chains (Sullivan and Gouldson, 2020). However, very little is known about the efforts of companies to contribute to GHG reduction and whether or not their efforts are sufficiently meaningful. Companies would also be expected to set targets for achieving reductions in their emissions that are more ambitious and to avoid reporting incomplete results (Mancini *et al.*, 2022). At the international level, a harsh criticism exists of the low standards that countries impose on themselves, which takes advantage of legal loopholes in environmental matters. Similar to public goods, emission reduction suffers from the free rider syndrome (Maraseni and Reardon-Smith, 2019). Academic researchers have explored the effectiveness of the efforts of companies to tackle climate change in various industries using different approaches and their incorporation of carbon and climate reduction strategies in all areas of their value chain. In terms of green energy (Khabibrakhmanov *et al.*, 2021) recognized the importance of community demand for green energy to reduce GHG emissions and paid due attention to fundamental shifts in the balance of utilities toward less carbon-intensive fuels. Hafker (2018) discussed the role that demand for green energy had in reducing GHG emissions and described fundamental shifts in the balance of utilities toward less carbon-intensive fuels. Javadi *et al.* (2021) analyzed energy consumption in the automotive industry and demonstrated that applications of renewable energy sources could decrease carbon emission intensity. Lazarus *et al.* (2021) stated that business organizations, particularly fossil fuel producers and livestock companies, are responsible for climate change in the livestock industry. Studies have investigated the contribution in addressing the climate crisis made by industrial sectors such as energy (Maraseni and Reardon-Smith, 2019; Filho *et al.*, 2018).

In addition, Rekker *et al.* (2018) underline that meeting global and national climate targets requires the serious commitments of various companies, such as fossil fuel producers, to mitigate climate change. Tunji-Olayeni *et al.* (2021) assessed the strategies for climate change mitigation used by manufacturing firms in Nigeria. Granberg (2018) maintained that local governments could design action strategies aligned with local policy environments to advance low-carbon transition. Previous studies have highlighted the importance of monitoring the commitments and achievements of companies' actions toward responding to climate change (Christiansen *et al.*, 2023; Dye *et al.*, 2021; Preudhomme and Mazzacurati, 2020). There are different approaches to academic reports regarding GHG emissions related to responsibility for the social, environmental, and economic impacts of a company's operations and corporate accountability. These include, for instance, government involvement and accountability for climate change (Abbass *et al.*, 2022); lack of accountability for a just transition in fossil fuels reduction (Bastos Lima, 2022); digital values, such as accountability, in the organization (Bianco *et al.*, 2021); connections between governance, accountability, and social and environmental issues (Denedo and Egbon, 2021); accountability for quantify GHG emissions (Foster, 2021). Additionally, responsibility and accountability have been studied from different perspectives, such as human rights violations (Jägers, 2021); lack of sustainability, environmental, social governance, transparency, and accountability (Kharas, 2021); reporting to promote business transparency and mitigation actions (Keat-Chuan-Ng and Webber, 2023); and sustainability and accountability in emerging economies and transparency (Ortiz Palafox, 2021). Education is also a relevant institution for working on climate change (Esprit, 2021; Öztürk and Pizmony-Levy, 2022). There is also a committed involvement for environmental accountability and transparency (Sautya *et al.*, 2022; Silvola and Landau, 2021; Segers *et al.*, 2022; Villiers, 2022). Efforts have been made to enable actions to reduce environmental impact and contribute to a more sustainable future. These include reporting on activities to ensure compliance with international guidelines (Oberghassel *et al.*, 2021). In this regard, transparency, as a way of making information

accessible to customers, would encourage green behaviors (Aguir *et al.*, 2022; Al Sadawi and Ndiaye, 2021; Barros *et al.*, 2020; Jowers and Morales, 2017). Moreover, providing transparent information to relevant stakeholders has been part of research on climate change (Chowdhury *et al.*, 2021; Dawson *et al.*, 2022; Dyarto and Setyawan, 2021; Hori *et al.*, 2022; Iftekhhar *et al.*, 2021). Moreover, there is also research focused on transparency and environmental mitigation activities in the urban context (Kim and Choi, 2022; Melnyk *et al.*, 2021). Digital technology, transparency, and accountability for climate change are also trends seen in academic research (Ahl *et al.*, 2020; Bharti and Anand, 2021; Fantke *et al.*, 2021; Kamyab *et al.*, 2022; Lodhia *et al.* 2021). In particular, how digital technology, throughout the value chain (Chowdhury *et al.*, 2021; Sanderson and Stridsland, 2022) and supply chain (Basu *et al.*, 2023), can raise public awareness (Lazarus *et al.*, 2021) has been an object of interest. Furthermore, carbon disclosure can enhance the transparency and accountability of firms, leading to a reduction in firm risk exposure (Alsaifi *et al.*, 2022; García-Sánchez *et al.*, 2022; Kedward *et al.*, 2022; Strauß, 2021). In particular, there have been research approaches related to business transparency, climate governance, risk assessment, and finance (Simane and Bird, 2017; Smith and Lawrence, 2021). Moreover, there have been academic contributions related to sustainable production systems (Gill and Ramachandran, 2021; Lahtinen and Yrjölä, 2019) and lower corruption (Bhattarai and Conway, 2021). Board diversity, having more female members, should be pursued (Al-Qahtani and Elgharbawy, 2020; Jizi *et al.*, 2022; Ooi *et al.*, 2019) to increase transparency. The utilization of green energy platforms to report to its major stakeholders or trading partners is an effective tool for advancing transparency (Jang, 2020; Kumar *et al.*, 2020; Bizikova, 2022; Zebra *et al.*, 2021). Corporate accountability and transparency can serve stakeholders' interests better (Anderson *et al.*, 2020; Camilleri, 2019), as they can promote democratic and transparent governance processes (Amin-Chaudhry, 2016; Bernauer *et al.*, 2016; Gibbs and Maassen, 2021; Wiseman, 2018). One effective means of monitoring the progress of business commitment is with the use of open digital information portals, such as Global Climate Action. Although there are concerns about the accuracy and

comparability of commitments and achievements using digital portals (Romijn *et al.*, 2018), they still provide stakeholders with the opportunity to evaluate the actions taken by companies to reduce GHG. This promotes transparency and accountability and may encourage more companies to take steps toward tackling climate change. This article investigates the effectiveness of actions made by companies on climate action for greenhouse gas emissions reduction at the country level from major Latin American economies and their major trading partners. This study is part of a sustainable research project related to Business and Climate Change at Tecnológico de Monterrey, Monterrey City, Mexico, undertaken in 2021–2023.

Greenhouse gas emissions and corporate participation in Global Climate Action

The main LATAM economies in this study (5) were selected based on their gross domestic product (GDP) and participated in the climate action platform. The main trading partners of these economies were identified (6) based on each countries' foreign trade information. In addition, information from international financial and banking institutions that study trade relations between them was considered to select trading partners. A focus on the strongest economies is expected to show that the responsibility and commitment to GHG reduction is higher because under their current production model, these countries generate a higher rate of GHG. Both per capita and global levels of GHG were studied, as statistics differ. For example, China emits the most GHG globally, but its per capita is not the highest due to its high population density. The opposite is also true: Canada is the second highest GHG emitter, but as a country, it is not high on the list, due to its low population. In Fig. 1, it can be seen that the emissions status in major LATAM countries indicates that it decreased in 2019 and 2020, with Mexico showing the most significant reduction due to strong quarantine measures. Chile had the highest emissions, attributed to its intense economic activity, particularly in the extractive industry and lower population density. However, Fig. 1 shows a rebound in emissions in 2021, likely influenced by the economic recovery.

In Fig. 2, Brazil is the largest CO₂ emitter, followed by Mexico. The top five major economies in Latin

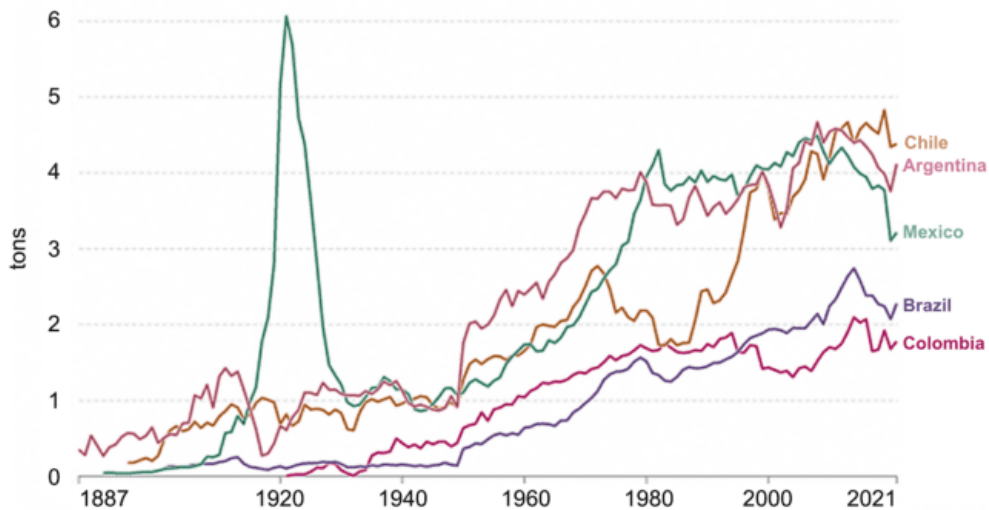


Fig. 1: Most relevant LATAM economies (Argentina, Brazil, Chile, Colombia, and Mexico) and their impact on CO₂ emissions per capita (Our World in Data, 2023)

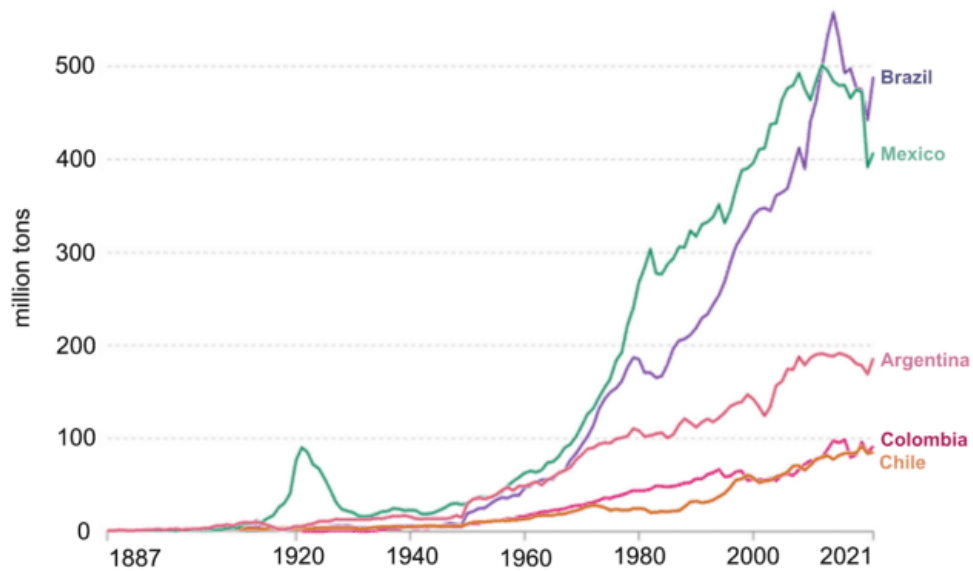


Fig. 2: Most relevant LATAM economies (Argentina, Brazil, Chile, Colombia, and Mexico) and their impact on CO₂ global emissions (Our World in Data, 2023)

America showed a decrease in CO₂ emissions globally in 2020 due to the Coronavirus disease (COVID-19) effect, but there was an increase in 2021. This highlights the importance of taking climate action to reduce emissions.

In Fig. 3, the CO₂ emissions per capita of major

trading partners of Latin American countries decreased during 2020, except for China, which showed a slight decrease in 2019 and an increase during the pandemic. However, like Fig. 1, this group of countries saw an increase in GHG emissions per capita during 2021.

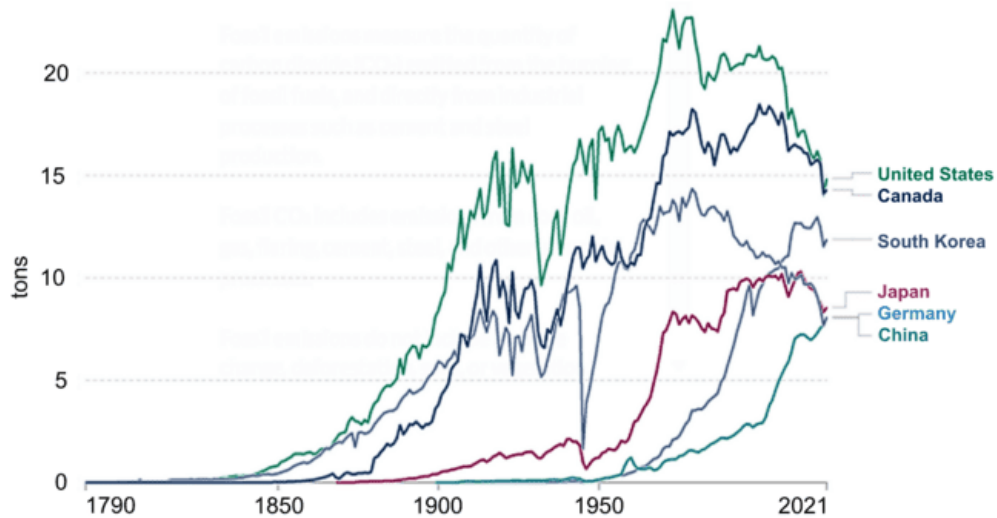


Fig. 3: Major trading partners (United States, Canada, Republic of Korea, Japan, Germany, and China) of the most relevant LATAM economies and their impact on CO₂ emissions per capita (Our World in Data, 2023)

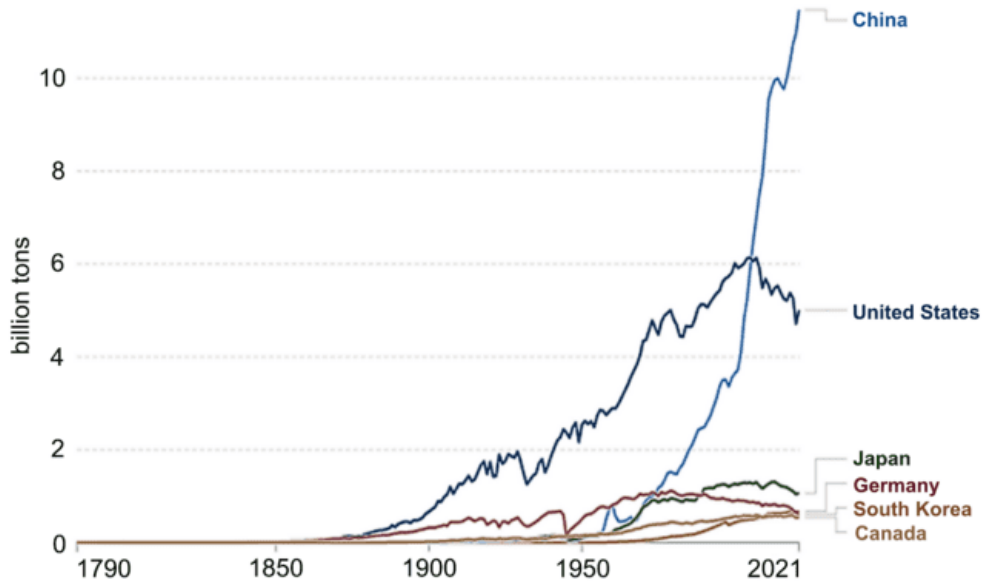


Fig. 4: Major trading partners (United States, Canada, Republic of Korea, Japan, Germany, and China) of the most relevant LATAM economies and their impact on CO₂ emissions at the country level (Our World in Data, 2023)

China has the highest CO₂ emissions among the major trading partners of LATAM economies, followed by the United States (USA) (Fig. 4). Other countries showed a slight increase in emissions in 2021 after a decrease in 2020, whereas China's emissions continued to grow due to its rapidly

growing economy. Although Chinese companies joined Climate Action, they have not effectively reduced global CO₂ emissions.

The study analyzed the major LATAM economies with their international trading partners using GHG emissions per capita and by country, considering

Climate action and greenhouse gas emissions

Table 1: Companies participating in the Global Climate Action of the main LATAM economies and their major trading partners

Countries	A	B	C	D	E	F
	# Companies in GCAC*	# Companies in GCAI**	# Companies in GCAC* with reporting the progress C	# Companies in GCAC* without reporting the progress D	C/A (%)	C/D (%)
	A	B	C	D	E	F
LATAM economies						
Mexico	166	132	28	99	17%	28%
Chile	136	131	4	119	3%	3%
Brazil	354	276	68	259	19%	26%
Colombia	92	84	10	52	11%	19%
Argentina	146	144	2	125	1%	2%
Main International partners						
USA	1535	1118	522	937	34%	56%
Canada	304	234	71	177	23%	40%
China	788	186	416	365	53%	114%
Korea	149	50	83	74	56%	112%
Germany	346	270	96	184	28%	52%
Japan	558	211	404	254	72%	159%

*Global Climate Action Commitment (GCAC)

**Global Climate Action Initiatives (GCAI)

the difference in GHG emission by years (2020–2019 and 2021–2020) in correlation with companies participating in Global Climate Action and the rate of public reporting. The study hypothesized corporate participation in Global Climate Action and their progress is negatively related to GHG emission per capita and at the country level over time. The study focused on Argentina, Brazil, Chile, Colombia, and Mexico and their major international trading partners: China, South Korea, Germany, Japan, Canada, and the United States. References to the European Union were deliberately excluded unless they explicitly mentioned the country in question, as in the case of Germany. Table 1 summarizes the number of companies per country committed to Global Climate Action, such as emission reductions, the use of renewable energy, and the avoidance of CO₂ emissions. Brazil has the highest number of companies participating and reporting progress in LATAM, followed by Mexico, but both have room for improvement. In this region, the percentage of progress reporting is lower than their major trading

partners, highlighting the importance of increasing accountability and focusing on results.

Meanwhile, declaring commitments and exercising discipline in reporting progress are necessary initiatives in terms of GHG reduction. The USA stands out in terms of the number of companies participating in Global Climate Action, but China, Japan, and the Republic of Korea stand out for their accountability in GHG reduction initiatives.

In Fig. 5, Japan and the Republic of Korea have low emissions, with a high proportion of companies publicly reporting on their climate actions. Their governments have declared emissions reduction targets, and companies have established measures to reduce GHG emissions, possibly due to the importance of ESG (environmental, social, and governance concerns) among investors. These countries promote information disclosure related to ESG to attract conscious investors, and their major global leading companies have high sustainability reporting rates.

Korea and Japan incentivize ESG reporting and

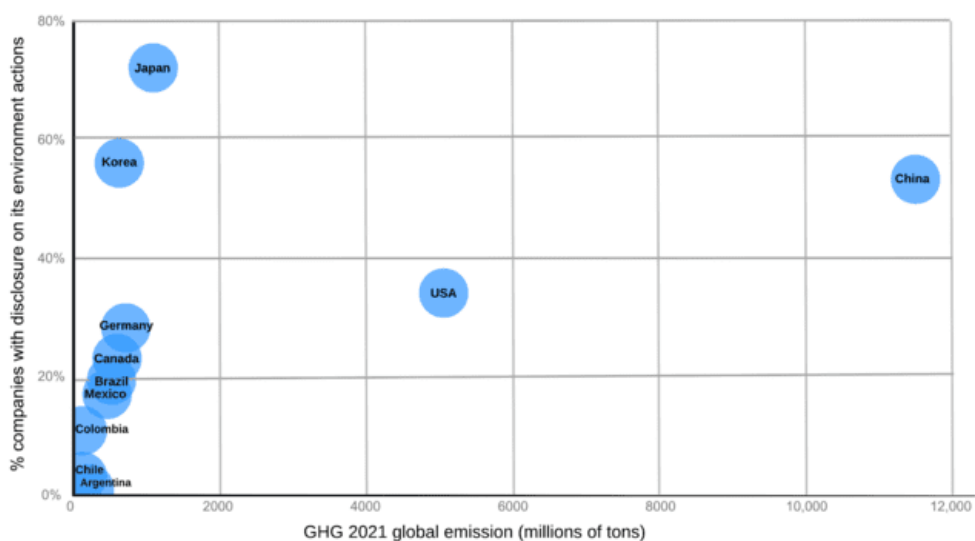


Fig. 5: GHG emission (million tons) and % of companies with public reporting on their Global Climate Actions

Table 2: GHG global and per capita of the main LATAM economies and their major trading partners

Countries	GHG2019 per capita (tons)	GHG2020 per capita (tons)	GHG2021 per capita (tons)	GHG2019 global (millions of tons)	GHG2020 global (millions of tons)	GHG2021 global (millions of tons)
Main LATAM economies						
Mexico	3.77	3.11	3.21	472.19	391.71	407.21
Chile	4.83	4.34	4.38	91.96	83.83	85.45
Brazil	2.24	2.07	2.28	475.10	442.31	488.88
Colombia	1.92	1.68	1.78	96.44	85.53	91.70
Argentina	3.99	3.76	4.12	178.51	169.26	186.45
Major trading partners.						
USA	15.73	14.04	14.86	5260.00	4720.00	5010.00
Canada	15.58	14.12	14.30	584.71	534.86	545.63
China	7.55	7.69	8.05	10740.00	10960.00	11470.00
Korea	12.47	11.53	11.89	646.10	597.63	616.08
Germany	8.50	7.67	8.09	707.15	639.38	674.75
Japan	8.79	8.32	8.57	1110.00	1040.00	1070.00

disclosure, with Korea also offering financial incentives for ESG-compliant companies (Sahar et al., 2022; Yeo, 2021). China has also employed penalties such as lower credit ratings for companies that violate carbon emissions targets (Huld, 2022). For LATAM, this visualizes that fewer emissions

reductions are seen, maybe because its economies are emerging and have only limited growth. In addition, the number of companies participating in Global Climate Action and their level of progress reporting is very low. Based on the previous discussion, more companies should join Global Climate Action with

Table 3: Pearson's correlation of the annual changes in GHG emissions by country (2020–2019 and 2021–2020) and participation in Global Climate Action

		Changes in GHG Per Capita		Changes in global GHG Emissions	
Corporate participation in climate action	Statistics	Difference GHG per capita (2020–2019)	Difference GHG per capita (2021–2020)	Difference GHG global emissions by country (2020–2019)	Difference GHG global emissions by country (2021–2020)
Number of companies participating in Global Climate Action	Pearson Correlation	–0.412	.827**	–0.629*	.718*
	Sig. (2-tailed)	0.207	0.002	0.038	0.013
	N	11	11	11	11
Rate of companies with public reporting	Pearson Correlation	0.132	0.485	0.087	.995**
	Sig. (2-tailed)	0.698	0.130	0.800	0.000
	N	11	11	11	11

concrete commitments; however, apart from their commitment to climate action, the public reporting of climate actions should be reinforced to verify the progress and effectiveness of their actions. Given the number of companies and their public reporting in [Global Climate Action \(2023\)](#) and GHG emissions by country, global, and per capita from 2021–2020 and 2020–2019, from [Our World in Data \(2023\)](#), the study analyzed the correlations between both sources. The test statistic used in this study is the Pearson correlation coefficient, which measures linear correlation between two sets of data (values from –1 to 1). Here, it describes the data on GHG emissions and the participation of companies in climate action. Although the statistic does not predict future results, it does show a trend that can be expected to continue unless drastic changes are made. For that purpose, GHG emissions by country ([Table 2](#)) from [Our World in Data \(2023\)](#) and data from [Global Climate Action \(2023\)](#) are provided ([Table 1](#)).

First, to find the correlations between the difference in GHG emissions *per capita* from 2019, 2020, and 2021 and the number of companies participating in Global Climate Action in 2023, Pearson correlation statistical test was applied. Then, the correlation between the difference in GHG emissions from 2019, 2020, and 2021 was explored to see how the public reporting progress emissions impact the GHG emissions ([Table 3](#)).

[Table 3](#) presents a positive correlation between GHG 2021–2020 change in global emissions

companies participating in climate action (Pearson = 0.718*, sig = 0.013) and reporting progress on their commitments (Pearson = 0.995*, sig = 0.000). Furthermore, the per capita level of GHG emissions 2021–2020 and the relationship with the participating companies is also significant (Pearson = 0.827** sig = 0.002). However, this contradicts what was expected, namely, a negative correlation. The correlation observed between the number of companies and the 2019–2020 emissions (Pearson = –0.629* sig = 0.038) can be attributed to the impact of the pandemic on the global economy and thus a significant reduction of GHG (Kumar *et al.*, 2022). The findings of this study are in line with previous work by [Van den Berg et al. \(2022\)](#), [Taylor et al. \(2021\)](#), and [Kinley et al. \(2021\)](#), who highlighted gaps between what stakeholders promise and what they actually deliver, as well as a lack of scientific climate information and data sharing related to corporate climate change. These issues are consistent with the results of the present study, indicating that they are ongoing challenges that require immediate attention. In addition, the current study's findings are also consistent with work by [Bastos Lima \(2022\)](#), [Ortiz Palafox \(2021\)](#), [Kharas \(2021\)](#), and [Keat-Chuan-Ng and Webber \(2023\)](#), who identified a lack of sustainability, environmental, and social governance as key issues facing organizations. They called for greater transparency and accountability in addressing these challenges. Thus, this study forms a contribution to the growing body of literature emphasizing the importance of sustainability and

environmental responsibility in corporate decision-making. Companies must focus efforts to reduce GHG emissions through mitigation measures, seeking to counteract or minimize negative environmental impacts. These measures are consolidated in a mitigation plan and are part of the environmental impact assessment. A key mitigation measure is to stop using fossil energy and use alternative energy, as well as applying technology to achieve greater energy efficiency. While several authors have argued on this topic, this article has the distinction of directly analyzing the situation of the climate crisis and climate action during and after the pandemic for a group of countries. In addition to reinforcing previous discussion, this particular analysis specifically points out how the post-pandemic economic recovery threatens the planet's climate crisis more strongly, regardless of the significant contributions made by companies to climate action. For [Van den Berg et al. \(2022\)](#), accountability-driven and evidence-based evaluation are needed to assess the effectiveness of investments in adaptation and mitigation. The findings of this research support the aforementioned need. Evidence is provided to demonstrate how participating with commitments and showing progress in mitigation or adaptation to climate change is not sufficient for the climate crisis. For [Kinley et al. \(2022\)](#) leading with climate crisis requires systems focused on climate treaties' goals for data sharing and transparency and the growing engagement of stakeholders. Unfortunately, governments have failed to fully implement treaty obligations, exacerbated by the still inadequate response of the business community. The results of this research provide evidence of the need to increase the level of response from the business community to achieve greater effectiveness in addressing the climate crisis.

CONCLUSIONS

During the pandemic, GHG emissions decreased, primarily due to the economic slowdown rather than the efforts of companies to address climate change (Pearson = -0.629 sig = .038). After the pandemic, there was a statistically significant and positive correlation between the number of companies committed to GHG reduction and GHG global emissions (global Level Pearson = .718*, sig = .013 and per capita, Pearson = .827**, sig = .002). This

suggests that business organizations have made only marginal contributions to reducing GHG emissions, and it raises questions about the effectiveness of the current voluntary disclosure regime for companies' climate change commitments. LATAM countries have fewer companies participating in Global Climate Action and reporting their progress (10%) than their major trading partners (44%). Initiatives and commitments are necessary for climate action but that alone is not enough. Transparency and accountability are key to effectively achieving GHG reductions and curbing the impending climate crisis. From a global perspective, it is clear that the acceleration of the production system has led to an increase in GHG emissions that has not kept pace with the commitments and reported achievements for reducing emissions. Companies must take significant actions to reduce emissions and report their results in a timely manner. These findings do not reduce the importance of initiatives like Global Climate Action but do highlight the need for more comprehensive and standardized approaches to climate change. Analyzing the information of countries and companies to adhere to such initiatives is crucial to increasing demand for countries and economic factors to address climate change.

Limitations

The size of its sample limits this article since it is based on secondary information reported by [Our World in Data \(2023\)](#), which presents information on GHG emissions up to 2021. Moreover, [Global Climate Action \(2023\)](#), this limitation represents a strength since it allows us to include the main economies of LATAM countries and their major trading partners in the analysis. Considering these limitations, the study yields interesting results that reflect the way forward for the business sector to follow the actions being taken by its trading partners. The other limitation is that the most current information on GHG emissions includes up to 2021. Also, there is no historical information on corporate participation in Global Climate Action; only the information generated to date is available.

AUTHOR CONTRIBUTIONS

F.G. Arredondo-Trapero, the first author, has conducted the literature review, gathered data from open-access platforms, and interpreted the results

of the data analysis. E.M. Guerra-Leal, the second author, has analyzed the data and interpreted the results for the implications. J. Kim, the corresponding author, has drawn implications from the conclusions of the result and prepared the manuscript.

CONFLICT OF INTEREST

The author declares that there is no conflict of interest regarding the publication of this manuscript. In addition, the ethical issues, including plagiarism, informed consent, misconduct, data fabrication and/or falsification, double publication and/or submission, and redundancy, have been completely observed by the authors.

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ABBREVIATIONS

%	Percent
°C	Degree Celsius
CEO	Chief Executive Officer
CO ₂	Carbon dioxide
COP26	2021 Climate Change Conference
COVID-19	Coronavirus disease

EPA	U.S. Environmental Protection Agency
ESG	Environmental, Social, and Governance
ETS	Emission Trading Scheme
GCAC	Global Climate Action Commitment
GCAI	Global Climate Action Initiatives
GDP	Gross Domestic Product
GHG	Greenhouse gas
ISO	International Organization for Standardization
IPCC	Intergovernmental Panel on Climate Change
LATAM	Latin America
SDG	Sustainable Development Goals
Sig.	Significance
UN	United Nations
USA	United States of America
WBCSD	World Business Council for Sustainable Development
WRI	World Resources Institute

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