

Carbon Chronicles: A Framing Analysis of Climate Coverage in Leading Emitter Nations (China, USA, and India)

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ABSTRACT

Aim of the Study: The analysis investigates climate change reporting through prominent English-language newspapers within China, the United States, and India, the top GHG-emitting states. The research analyzes media attention to climate change as well as climate-related framing and major international climate impacts on news coverage within these three major global emission countries.

Methodology: A quantitative content analysis analyzed climate-related news items and editorials published from April 4th, 2021, to April 3rd, 2023, within China Daily in China and US Today in the US, and the Times of India in India. Researchers studied 1,181 news articles to investigate the quantity of coverage and media presentation styles as well as their response to the release of the IPCC AR6.

Findings: The Times of India published climate-related content at 54.7%, while China Daily published at 33% and US Today at 12.3%. Science reporting on climate change stretched to 15.98% of all news content following the release of IPCC AR6. Results showed that the “Attribution of Responsibility” frame stood as the primary frame found in 35.9% of the examined news articles.

Conclusion: The findings highlight a disparity in the volume of climate coverage across the top-emitting countries while also pointing to a shared increase in media attention following the release of IPCC AR6. The Indian press demonstrated the highest level of engagement. This study contributes to a deeper understanding of global climate communication and underscores the critical role of media in shaping public discourse on climate change.

Keywords: Climate Change and Media, Climate Framing, Major Emitters, Top 3 Leading Emitters, GHG, China, USA, India, IPCC, AR-6.

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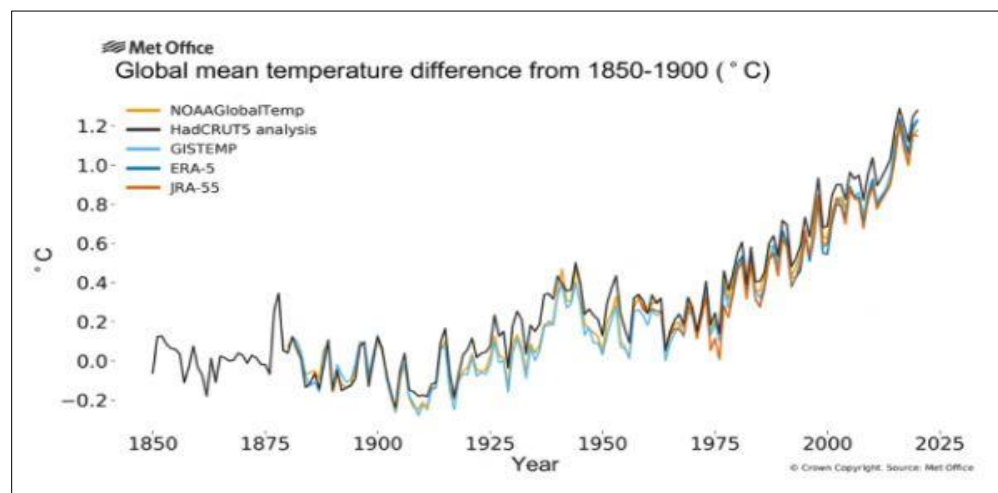
1. INTRODUCTION

Swedish scientist Svante Arrhenius (1859–1927), a Nobel Prize winner, was the first to scientifically investigate the relationship between Earth's atmosphere, greenhouse gas emissions, and temperature variations. In the late 19th century, he initiated research on what is now recognized as one of the most pressing global challenges and a significant threat to human civilization, climate change (Sample, 2005).

Climate change refers to long-term shifts in temperatures and weather patterns. While natural factors, such as variations in the solar cycle, can influence these changes, human activities since the 19th century have been the primary drivers of global warming. The combustion of fossil fuels- including oil, coal, and gas- has led to significant greenhouse gas (GHG) emissions that trap solar heat and contribute to rising global temperatures. Key GHGs, including carbon dioxide (CO₂), methane (CH₄), and carbon monoxide (CO), originate from various sources, notably the burning of fossil fuels (Younis and Ahmed, 2024; Ibrahim et al., 2024; Meehl et al., 2005).

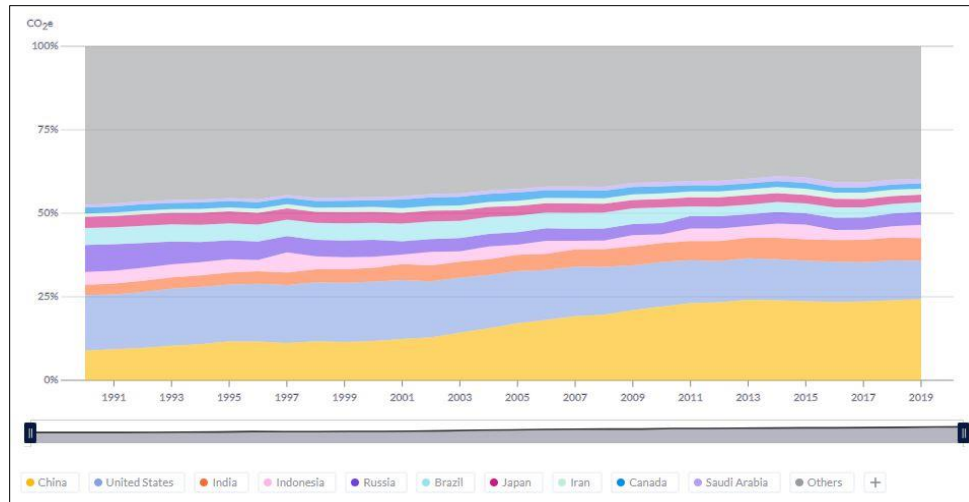
Climate change has emerged as a significant global threat to humanity, and around the world, countries are already facing its negative impacts. Importantly, regardless of whether a country significantly emits carbon, it may still be highly vulnerable to the effects of climate change, which are primarily driven by greenhouse gas (GHG) emissions (Emeka et al., 2024; Ahmed et al., 2024; Raza and Shah, 2024).

According to the data, greenhouse gas emissions, particularly CO₂, have remained constant since the Industrial Revolution, resulting in a global temperature increase of approximately 1.1°C above pre-industrial levels. The decade from 2011 to 2020 was noted as the warmest in human history. in human history (WMO, 2021; Ayoub and Ahmed, 2024).



The last decade was the warmest in history (Source: World Meteorological Department)

Greenhouse gas (GHG) emissions contribute to climate change, impacting all nations. However, the most affected countries are often not the largest emitters. The top ten highest-emitting nations account for 68% of global GHG emissions, while the 100 lowest-emitting countries contribute only 3% (Climate Watch, 2022; Riaz and Farhan, 2023).



Top 10 CO₂-emitting countries. Source: Climate Watch Data

1.1 Role of Top Emitters in Emissions

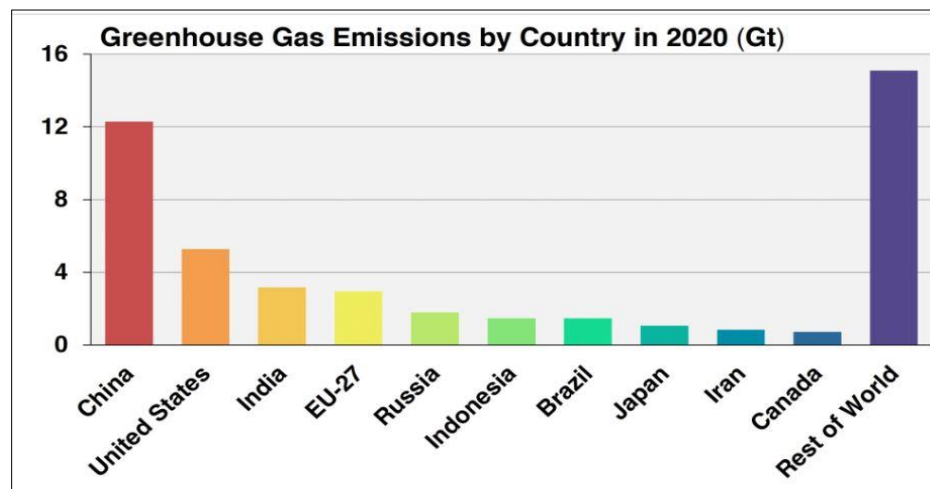
Nations worldwide recognized the reality of climate change through the adoption of the Paris Climate Agreement in 2015. Addressing climate change requires significant action from the largest emitters, as just 20 countries account for more than three-quarters of global greenhouse gas emissions, with China, the United States, and India being the foremost contributors (Nunez, 2019; Parker & Blodgett, 2012).

China: The largest current emitter of CO₂, accounting for approximately 31% of global emissions.

The United States is the second-largest historical emitter of CO₂, contributing around 14% of total global emissions.

India is the third significant contributor to global emissions, contributing 7 %.

Other Key Emitters: The European Union, Russia, Indonesia, Brazil, Japan, Iran, and Canada also play substantial roles in global greenhouse gas emissions (NRDC, 2023; United Nations, 2022; USEPA, 2024).



Source: Data from Climate Watch; Climate Watch Historical GHG Emissions (1990-2020). 2023. Washington, DC: World Resources Institute.

1.2 Media and Climate Change

The media has historically played—and continues to play—a pivotal role as a primary source of information, education, entertainment, and opinion formation for vast audiences (Wilson, 2002). Extensive research has established a strong correlation between media content and public understanding of scientific issues, particularly in the context of climate change (Hase et al., 2021). Media coverage serves as a crucial mechanism for enhancing public awareness of scientific topics such as global warming, fossil fuel consumption, and climate change (Schäfer & O'Neill, 2017). However, reporting on environmental issues, particularly climate change, remains challenging for journalists due to the complexity and often gradual and unnoticeable nature of these phenomena (Ahmed, 2025; A. Sharif & Medvecky, 2018).

Extensive research has demonstrated that media representation of climate change significantly influences public cognition and perception. Globally, individuals rely on media as a primary source of information on various topics, including climate change, gaining insights into its causes, effects, potential solutions, and individual-level responses. Media-driven info dissemination is widely recognized, particularly when individuals actively seek climate-related knowledge through media channels (Khan et al., 2024; K. Sharif et al., 2023; Taddicken, 2013).

1.3 Research Gap

While conducting the current study, the researcher has reviewed extensive literature and found that numerous studies have analyzed media coverage of climate change at regional, continental, and global levels. However, a significant gap remains in comparative analyses focusing specifically on the top three greenhouse gas (GHG) emitter countries—China, the USA, and India. Research has primarily studied climate framing stories within individual countries or across multiple nations at a high level, while a precise evaluation regarding the leading nations' media representations of climate change narratives remains unexplored. The research addresses a missing gap through its examination of climate change coverage features which differentiate and unite three major newspapers in China and the USA as well as India. The way high-emission nations present climate-related news to their audiences requires a comprehensive investigation to reveal their main messages affecting climate policy development, alongside public reaction to environmental matters. The research examined how influential countries affect climate awareness development, together with agenda-setting mechanisms and worldwide climate action discourse through their press environment (Antilla, 2014; Billett, 2010; Boykoff & Yulsman, 2013; Doulton & Brown, 2009; Olausson, 2011; Painter, 2015; A. Schmidt et al., 2013; Takahashi & Meisner, 2013).

1.4 Statement of Problem

The International Panel on Climate Change (IPCC), through its assessment report (AR6), showed evidence of continuous global warming triggered by greenhouse gas emissions that include CO₂, which produces climate change conditions. Due to human activities, recent variations in climate are widespread, rapid, intensified, and unprecedented. Scientists believe that if the average temperature of Earth exceeds 1.5 °C (34.7° F) before 2050 to preindustrial times (1850), it would be difficult to avoid the tipping points on Earth (Climate Action Network, 2022; IPCC, 2023). It is generally believed that if the media, especially newspapers, repeatedly highlight any issue, it gains reasonable attention from the common masses and policymakers. In the backdrop, the role of media becomes inevitable regarding climate coverage. The current study is designed to examine whether media coverage of climate change fluctuates in different countries (the top 3 carbon emitters). It will further examine how the media of the top 3 emitter countries frame the issue of climate change.

1.5 The Objectives of the Study

1. To examine climate change coverage in newspapers from China, the USA, and India
2. To compare climate change coverage in newspapers of the top 3 carbon-emitting countries before and after the release of the IPCC AR6.
3. To examine whether media coverage of climate change is influenced by climate catastrophes or socio-political events in the emitter countries.
4. To explore how climate change is framed in the press of China, the USA, and India.

1.6 Hypotheses of the Study

H1: The coverage of climate change varies significantly across newspapers in the top three carbon-emitting countries.

H2: It is likely that climate change coverage in newspapers from the top three carbon-emitting countries increased following the release of the IPCC Sixth Assessment Report.

H3: The framing of climate change in news coverage will likely differ significantly among newspapers in the top three carbon-emitting countries.

H4: It is likely that news stories related to extreme weather events will be less frequent compared to those covering socio-political aspects of climate change in the top three carbon-emitting countries.

1.7 Research Questions

1. How is climate change covered in newspapers from China, the USA, and India?
2. How did the release of the IPCC's 6th Assessment Report impact the volume of climate change coverage in the press of the top three carbon-emitting countries?
3. To what extent is climate change coverage in the newspapers influenced by climate catastrophes or socio-political events?
4. What framing strategies are used in climate change reporting by newspapers in China, the USA, and India?

1.8 Significance of Study

This study provides a comprehensive analysis of how climate change is reported in the media of the top three carbon-emitting countries: China, the USA, and India. It examined whether climate coverage primarily focuses on socio-political events (e.g., UN reports, climate accords, conferences, protests), climatological catastrophes (e.g., floods, heatwaves, droughts, glacier melting), or scientific data (e.g., greenhouse effects, global warming, carbon emissions). By analysing media coverage in these major carbon emitters, the research offered insights into how climate change is framed and prioritized in global journalism.

Public officials across these nations can use research findings to understand how media influences climate change discussions in the public domain. These findings allow organizations to design effective media strategies for enhancing climate knowledge and policy actions. Through this study, the authors want to support academic scholarship by integrating climate communication studies into media research while promoting the use of evidence-based approaches to environmental news reporting in Chinese and US, and Indian media institutions.

2. LITERATURE REVIEW

The World Meteorological Organization defines climate as weather patterns that need to be observed across three decades. The analysis of climate extends across nations as well as regions and continents and can also reach the level of hemisphere scales or systems at a global scope. The long-term analysis period reduces the simplification of climate-related content compared to standard news stories. The primary human-produced climate change factors, particularly greenhouse gas (GHG) emissions, remain detectable by journalists due to their unnoticeable nature. Strong barriers to climate reporting arise from the insufficient communication between scientists studying climate change and media professionals who report on it. The collection of scientific data for climate change research employs three fundamental methods that involve measurements and models, as well as research projections conducted by scientists throughout the world. Media interpretation faces challenges because scientific data exhibits various forms, which can create conflicts during news reporting. Lastly, climate change, while critical, lacks immediate news appeal due to its long-term societal consequences. Additionally, mitigation strategies are complicated, debatable, and difficult to communicate effectively (Ahmed, 2025; Ahmed & Kashif, 2025; Akram et al., 2023; Khan et al., 2024; Muhammad et al., 2024; Rashid & Shah, 2025; Raza & Shah, 2024; Safdar & Butt, 2024; Schäfer, 2015; Schäfer & Painter, 2021)

Schäfer & Schlichting (2014) pointed out that although there is development and diversification in research studies associated with climate change still frequently centered on specific countries in Europe and North America. European and American countries usually grab the attention of climate change research. As far as Latin America (South America), Africa, and somehow Asia are concerned, these are often vulnerable to the consequences of climate change, are usually not considered for research, and have not been analyzed (Ahmed & Kashif, 2025; Akram et al., 2023; Raza & Shah, 2024).

As cited by Carvalho & Burgess (2005) apart from the rapidly swelling multidimensional traditional and social media, newspapers continue to perform a decisive role as reflections of public concern and agenda setters in connection with climate change.

2.1 Climate Change, Media, and China

W. Li et al. (2022), reported a significant rise in temperatures in China in recent years based on systematically collected scientific data. In 2021, the average temperature in China reached 10.5°C, which was 1.0°C above the climatological norm (1981–2010 average) and the highest recorded since 1951. Fifteen meteorological stations across China recorded their highest rainfall totals in 52 years, and the annual average reached 672.1 millimeters, which exceeded the 6.7% normal range. The weather patterns in China are showing signs of intensification based on these meteorological anomalies, which demonstrate clear climate change effects. Since 2006, China has claimed the title of being the largest carbon dioxide polluter, which only worsens environmental degradation alongside escalating climate-related challenges across the nation.

Wang et al., (2022) researched 81 scholarly papers on “China and climate change coverage” through systematic analysis which explored media content and public awareness strategies and discourse frameworks plus adaptation analysis and content analysis methodologies. Literature research shows that Chinese media follow state directives and regularly present information about climate change through the official government perspective. Multiple studies demonstrate that China's climate news reports support official environmental and climate change policies by simply representing government views.

Zhang et al. (2022) tracked Chinese press coverage of climate change throughout twenty years from 2000 to 2020, which showed substantial state intervention in media reporting. Research shows that Chinese media receives supervision from the Communist Party system, through which it faces restrictions on editorial independence. Media coverage about climate change primarily presents governmental policy statements, which changes the local news coverage to follow official commands. Media censorship,

together with political propaganda, determines the way climate communication unfolds because it reinforces state-controlled messaging while advancing China's global position regarding climate issues.

China produces the highest amount of carbon emissions globally, yet its climate change media patterns remain poorly studied. Throughout modern history, global warming was considered first a scientific quandary, yet contemporary media has transformed it into a crossroads of social and political factors. According to Su & Hu (2021), Chinese media outlets began to show more attention to climate change news following 2018. The newest media coverage about climate change mainly focuses on four main topics that combine public understanding with economic progress and governance responsibilities, and accountability.

2.2 Climate Change, Media, and the USA

Total carbon dioxide emissions from the United States position the nation as the second rank after China and ahead of the European Union, India, along Russia. The United States' withdrawal from the Paris Agreement triggered major debates throughout the nation and worldwide because it created confusion about climate policy direction and raised questions about U.S. greenhouse gas emission reduction goals. President Donald Trump explained his action by claiming that economic growth required more attention than international climate responsibilities (Castillo Esparcia & López Gómez, 2021).

People in American society show strong and antagonistic views regarding climate change because their political beliefs influence their understanding of climate issues. Liberal-oriented people understand climate change threats to be substantial while showing elevated concern about impacts, but conservative thinkers normally view its negative effects with doubt. Selective media exposure fuels ideological division because people tend to watch information that confirms their existing climate change beliefs, according to Feldman et al. (2017) and Melillo et al. (2014).

American media outlets show climate change skepticism through diverse levels of intensity because economic growth goals centered on fossil fuels and natural resource exploitation maintain significant strength in national priorities. The combinations between economic development and environmental protection, and climate policy have created clear divisions within public discussions (Song et al., 2022).

According to Koehler (2016), leading newspapers in the United States displayed extensive empirical data backing up widespread scientific agreement about human activities causing climate change. Although numerous sources agree on this conclusion, media outlets commonly show competing positions through their coverage to maintain neutrality. The use of the “false balance” approach through media platforms mistakenly increases the public's inaccurate understanding of scientific climate change uncertainty.

2.3 Climate Change, Media, and India

India, home to a substantial energy-deprived population, is the world's third-largest emitter of CO₂. Projections suggest that by 2030, the country's carbon emissions will double compared to 2012 levels (Dubash et al., 2018). With a high climate vulnerability index, India's response to climate change is expected to be shaped by domestic policy debates and global mitigation commitments (DARA, 2012). As a signatory to the Paris Agreement, India has voluntarily pledged to reduce GHG emissions and is anticipated to play a leading role in global climate action (Jaiswal, 2017).

Despite being the seventh-largest country by land area and the second-most populous nation, India ranks 130th in human development, according to the United Nations (Human Development Report Office, 2016). However, it remains the third-largest emitter of GHGs while maintaining the world's sixth-largest GDP (Dubash et al., 2018).

India faces the consequences of climate change in two critical ways. First, extreme weather events and other climate-related challenges are already having a profound impact and are expected to worsen in the future (DARA, 2012). Second, climate change threatens to impede India's economic and fiscal growth by exacerbating energy security challenges. Additionally, it poses a risk to the country's progress toward key

national development goals, including poverty eradication and public health improvements (Hijioka et al, 2014; Keller et al., 2020).

Keller et al. (2020) highlighted the scarcity of research on climate change coverage in developing countries, including India, which has the second-largest population and is the third-largest contributor to global greenhouse gas emissions. Despite its significant role in shaping global climate policies, media coverage of climate change in India remains an underexplored area. Research studies about the way Indian media covers climate change have shown restricted boundaries by examining standalone events through temporary media exposure. The duration and frequency at which these topics receive attention in the media have proven to be brief and limited. Published climate change reports have risen consistently throughout Indian media between 1997 and 2016.

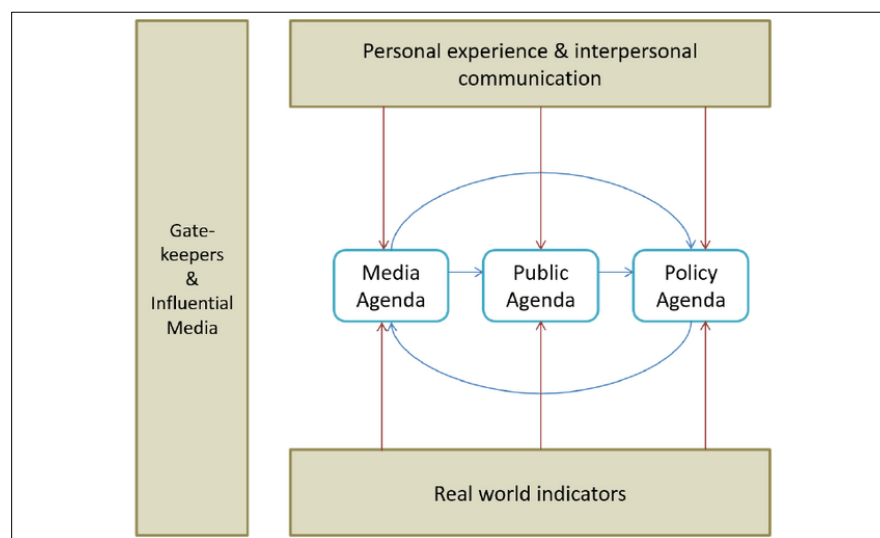
Studies about climate change news coverage in India examine primarily small news samples from specific time periods concerning particular events, including the IPCC report release in 2007 and the Copenhagen Climate Change Conference in 2009 and related events (Lück et al., 2018; Mittal, 2012; Painter & Ashe, 2012).

The research in India concentrates mainly on preselected themes like risk management, together with issues of responsibility and scientific themes of climate justice. Media coverage volume analyses form the basis of research by Billett (2010), Jogesh (2012), Mittal (2012), and Painter and Ashe (2012) due to their lack of thorough categorization methods for essential themes in these studies.

3. THEORETICAL FRAMEWORK

This study employs a comparative analysis of global newspaper coverage of climate change, utilizing agenda-setting theory at the first level to examine issue prominence and framing theory at the second level to analyze the climate frames used in editorials and news articles.

Extensive research on the agenda-setting role of the media has established that media influence public opinion (public agenda) by determining issue salience (media agenda) and shaping the policymaking process (political agenda). While early agenda-setting studies focused on the media's ability to highlight issues, later research expanded the framework, emphasizing that media not only influence what audiences think about but also shape how they perceive and interpret these issues (McCombs & Shaw, 2016).



Agenda-setting Model.

This study aims to compare only the media agenda of different countries globally.

3.1 Climate Change, Agenda-Setting, and Framing

A research article, “Agenda-Setting and Climate Change,” by Pralle, (2009) provided an insightful analysis of the relationship between public issues and governmental attention, with a particular focus on climate change. The study supports the agenda-setting theory and offers a comprehensive explanation through Kingdon’s multiple streams model of agenda-setting. This model identifies three streams—troubles, policies, and politics—and argues that the convergence of these streams can elevate an issue, including climate change, to a more prominent position on decision-making agendas. Pralle (2009) emphasized the necessity of keeping climate change at the forefront of governmental, public, media, and policymaker agendas, given its long-term nature.

Wonneberger & Vliegthart (2021) argued that if the media and political systems consistently fulfill their roles in the policymaking process concerning climate change, it could lead to a more extensive public discourse on the issue, both in the context of litigation and within the news media (Ahmed et al., 2024; Mahmood, 2022; Mahmood & Ahmad, 2013).

Scholars define framing as the criteria through which individuals evaluate public and political events. Frames typically involve deliberate selections that highlight certain aspects while excluding others. Framing can also be understood as the process of emphasizing specific angles of reality to enhance the prominence of particular perspectives, thereby endorsing a specific issue along with its definition, moral judgment, causal explanation, and recommended solutions. (Adams & Goffman, 1979; Entman, 1993; Iftikhar & Shafiq, 2019; Levitt & Gitlin, 1981; Molotch et al., 1993; Robinson & Tuchman, 1981; Wendorf Muhamad & Yang, 2017).

3.2 Climate Framing

This study focuses on six key climate news frames, as identified by previous research (B. Li et al., 2021; Semetko & Valkenburg, 2000)

Attribution of Responsibility Frames: These frames present climate-related issues by assigning responsibility, identifying who is accountable for the problem, and suggesting potential solutions.

Economic Consequences Frames: These frames highlight the financial impact of climate change on individuals, communities, organizations, institutions, nations, or regions.

Public Health Frames: These frames emphasize the health risks associated with climate change, including increased illness and mortality rates due to factors such as rising temperatures and extreme heat waves.

Human Interest Frames: These frames focus on the emotional and personal dimensions of climate issues, highlighting individual experiences and human suffering.

Morality Frames: These frames frame climate change within ethical, moral, or religious contexts, shaping discussions based on values and principles.

Environmental and Biodiversity Frames: These frames examine the effects of climate change on ecosystems, wildlife, plant species, and overall biodiversity, emphasizing environmental degradation and ecological balance.

4. METHODOLOGY

This research investigates climate change reporting by the press throughout the three nations that produce the largest amount of carbon emissions worldwide. The research examines global media discourse by investigating the comparable and divergent framing techniques used by chosen newspapers to represent climate change.

Quantitative content analysis served as the method to analyze climate change coverage in the worldwide leading newspapers that originate from the three largest carbon dioxide-emitting nations. The main

purpose of this research is to create categories while establishing definitions, then conducting a comparison and analysis of how climate change reporting appears in chosen international newspapers.

The research conducts an analysis to discover which frames dominate climate change media coverage. The analysis depended on a deductive method, which applied established coding classes from academic papers to conduct a controlled, systematic examination.

Research about climate change media coverage within India primarily analyzes restricted news samples throughout defined time periods and focuses mostly on specific events such as the 2007 IPCC report and the 2009 Copenhagen Climate Change Conference (Lück et al., 2018; Mittal, 2012; Painter & Ashe, 2012).

Indian academic research has primarily concentrated on preset subject areas, including risk management, responsibility-related topics, and science-oriented themes of climate justice. The majority of research reviews media content volumes but fails to establish organized categories for central topics and themes (Billett, 2010; Jogesh, 2012; Mittal, 2012; Painter & Ashe, 2012).

4.1 Significant Event

Climate change moves quickly toward intensification as per the IPCC Sixth Assessment Report (AR6) because human activities are its main cause. The Earth has experienced a 1.1°C increase beyond 1850 pre-industrial temperatures, along with persistent temperature elevation.

The research investigates climate change media content throughout a two-year period after April 4, 2022, which marks the release date of the final segment of AR6. This research examines news articles together with editorials, as well as the ways climate change has been presented in the selected period.

4.2 Population of the Study

All global news articles and editorials about climate change that appeared between April 4, 2021, and April 3, 2023, make up the study population. The selected two-year duration provides global climate change media coverage, which serves as an extensive research database.

4.3 Sampling/ Sample Size

The research employs purposive sampling to analyze climate change media coverage in China as well as the United States and India, which represent the three biggest carbon-producing nations. A leading English-language publication in China Daily was chosen alongside US Today from the United States and The Times of India from India.

The research analyzed a total of 1,181 newspaper news articles plus editorials from these three newspapers spanning two years between April 4, 2021, and April 3, 2023, to study high-emission climate reporting and framing.

4.4 Categorization Scheme

Newspapers: 1= *China Daily*, 2= *US Today*, 3= *Times of India*

Length of Story: 1= Below 500 Words, 2= 501 to 1000 Word, 3= Above 100 Words

Type of Story: 1= News, 2 = Editorials

Climate Categories: 1= Extreme Weather, 2 = Socio-Political Events

Frames: 1= Attribution of Responsibility, 2= Economic, 3= Human Interest, 4= Public Health, 5 = Morality, 6= Biodiversity

Timespan: 1 = Before AR-6, 2 = After AR-6

Data analysis of three prominent newspapers took place from the three highest carbon-polluting countries of China, the United States, and India. The international news databases of LexisNexis provided access at the U.S. Embassy in Islamabad.

The database compilation through LexisNexis searched for every article and editorial mentioning "climate change" within two years from April 4, 2021, to April 3, 2023, where the two years consisted of before and after the release of the IPCC Sixth Assessment Report (AR6).

Data analysis was conducted using the Statistical Package for Social Sciences (SPSS). Various statistical techniques, including frequencies, percentages, cross-tabulations, and Chi-Square tests, were applied to interpret and explain the findings.

4.5 Unit of Analysis

In content analysis, the unit of analysis holds significant importance but varies depending on the research context and objectives. It may include elements such as words, themes, phrases, articles, narratives, or characters (Neuman, 2013).

In this study, the unit of analysis is the entire newspaper, while the sampling unit consists of complete news articles and editorials. The coding unit is based on specific keywords related to natural disasters and socio-political events, enabling a structured examination of climate change framing in the selected media sources.

4.6 Conceptual Definition

The United Nations (2022) defines climate change as long-term shifts in temperature and weather patterns. The term climate is typically measured over a minimum period of three decades (WMO, 2021).

4.7 Operational Definition of Climate Change-Related Events

For this study, climate-related events are categorized into natural disasters and socio-political events based on definitions provided by the (WMO, 2021) and (G. A. Schmidt et al., 2014).

4.7.1. Climate Change-Induced Natural Disasters

Heat waves

Droughts

Glaciers melting and rising sea levels

Heavy rainfall and floods

Hurricanes, tornadoes, cyclones, and storms

Global warming

Human-induced factors (e.g., CO₂ emissions, fossil fuel consumption)

4.7.2. Socio-Political Events Related to Climate Change

Climate conferences, agreements, and webinars (e.g., CoPs, accords)

Local and international climate protests

UN/IPCC reports

Research studies from INGOs

Other(s)

4.8 Inter-coder Reliability

In content analysis involving multiple coders, a high level of intercoder reliability is essential, typically ranging from 0.72 to 1.0, with values above 0.80 generally considered acceptable (Krippendorff, 2022).

Table 1: Based on Krippendorff's Alpha Reliability test, the following table/ data was formulated

Run the MATRIX procedure: Krippendorff's Alpha Reliability Estimate						
Nominal	Alpha	LL 95% CI	UL 95% CI	Units	Observations	Pairs
	.8309	.8208	.8341	100.00	5.00	876.00
Number of bootstrap samples: 10000						
Judges used in these computations:						
obs1	obs2	obs3	obs4	obs5		

As indicated in the table above, Krippendorff's Alpha (α) value is 0.8309, which exceeds the acceptable threshold of 0.72, indicating a strong level of inter-coder reliability and consistency among the coders. This suggests that the coding demonstrated a high degree of agreement in applying the coding rules.

Furthermore, the test results confirm that increasing the sample size (e.g., through bootstrap sampling with 10,000 iterations) does not significantly alter the reliability estimate, thereby validating the robustness of the findings.

5. DATA ANALYSIS

The primary objective of this study is to examine the extent and nature of climate change coverage in the press of the top three carbon-emitting countries: China, the United States, and India. This research analyzes the frequency of coverage and the dominant media frames employed by selected leading English-language newspapers from each country. The study further explores whether the press in these high-emission nations primarily emphasizes extreme weather events or socio-political dimensions of climate change, offering insights into national media priorities and framing patterns in climate discourse.

Table 2: Climate Change News/Editorial Frequencies in Newspapers

	Story Type		Total
	News	Editorials	
<i>China Daily</i>	326	64	390 (33 %)
<i>US Today</i>	129	16	145 (12.3%)
<i>The Times of India</i>	556	90	646 (54.7%)
Total	1011	170	1181 (100.0%)

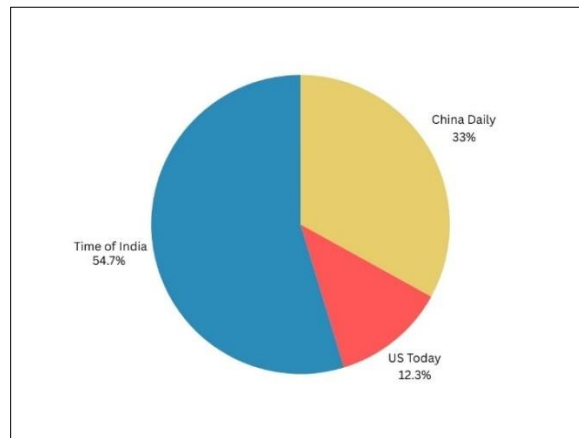


Figure 1: Frequency Distribution in Carbon Emitter Countries

Table 2 presents the distribution of climate change-related news and editorials across newspapers from the top three carbon-emitting countries. The *Times of India* accounted for the highest proportion of coverage, contributing 54.7% of the total articles, followed by *China Daily* with 33%, and *US Today* with the lowest share at 12.3%. Furthermore, the overall content from these newspapers comprised predominantly of news reports (85.6%, n = 1011), while editorials constituted a smaller portion (14.4%, n = 170).

This variation in frequency and type of coverage among the newspapers supports Hypothesis 1 (H1), which posits that climate change coverage significantly differs across newspapers in high carbon-emitting countries.

Table 3: *Climate News Coverage and Length of News Stories*

		Frequency	Percent
Valid	Below 500 Words	579	49.0
	501 to 1000 Words	458	38.8
	Above 1000 Words	144	12.2
	Total	1181	100.0

Table 3 illustrates the distribution of word counts for climate change-related news and editorial content in newspapers from the top three carbon-emitting countries. The findings reveal that nearly half of the articles (49%) contain fewer than 500 words, indicating a preference for brief reporting. A substantial portion (38.8%) of the content falls within the 501–1000-word range, while only a small number of articles (12.2%, n = 144) exceed 1000 words. This suggests that in high-emission countries, climate change coverage tends to be concise, with limited in-depth or extended reporting.



Figure 2: *Length of News Stories*

Table 4: *Climate News Coverage Before and After One Year of AR-6*

		Before AR-6	After AR-6	Total
<i>China Daily</i>	Count	180	210	390
	% of Total	15.2%	17.8%	33.0%
<i>US Today</i>	Count	77	68	145
	% of Total	6.5%	5.8%	12.3%
<i>The Times of India</i>	Count	290	356	646
	% of Total	24.6%	30.1%	54.7%
Total	Count	547	634	1181
	% of Total	46.3%	53.7%	100.0%

Table 4.1: *Pearson Chi-Square*

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	3.218 ^a	2	.200

Table 4 presents the comparative frequency of climate change news and editorials published before and after the release of the IPCC's Sixth Assessment Report (AR6) in newspapers from the top three carbon-emitting countries. The data indicate that both *China Daily* and the *Times of India* increased their coverage following the release of AR6, whereas *US Today* showed a decline in the number of published items during the same period.

Overall, a total of 547 articles (46.3%) were published before the release, while 634 articles (53.7%) appeared after the publication of the report. The chi-square test yielded a value of $\chi^2 = 3.218$, with a p-value of 0.200, suggesting a statistically non-significant difference. However, the upward trend in coverage across two of the three newspapers supports Hypothesis 2 (H2), which posits that the release of the IPCC's Sixth Assessment Report contributed to an increase in climate change reporting in the selected media outlets from high-emission countries.

Table 5: *Cross-tabulation of Climate Frames with Newspapers*

		<i>China Daily</i>	<i>US Today</i>	<i>The Times of India</i>	Total
Frames	Attribution of Responsibility	154	52	219	425
	Economic	60	31	86	177
	Public Health	43	22	54	119
	Human Interest	71	23	160	254
	Morality	28	3	41	72
	Biodiversity/ Species	34	14	86	134
Total		390	145	646	1181

Table 5.1: *Person Chi-Square*

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	30.224 ^a	10	.001

Table 5 presents the distribution of climate change news and editorials based on framing categories across newspapers from the top three carbon-emitting countries (N = 1181). The “attribution of responsibility” frame emerged as the most frequently used overall, appearing in 425 articles (35.9%). Among individual newspapers, *The Times of India* utilized this frame in 219 articles (18.5%), *China Daily* in 154 articles (13.0%), and *US Today* in 52 articles (4.4%). In contrast, the “morality” frame was the least frequently applied, appearing in only 72 articles (6.1%) across all three newspapers.

The results of the chi-square test ($\chi^2 = 30.224$, $p = 0.001$) indicate a statistically significant difference in the use of frames among the selected newspapers. Based on this evidence, Hypothesis 3 (H3) is accepted, confirming that the framing of climate change coverage significantly varies among newspapers in the top three carbon-emitting countries.

Table 6: *Climate Categories and South Asian Newspapers Crosstabulation*

		Climate Categories		Total
		Natural Disaster	Socio-Political Events	
	<i>China Daily</i>	152	238	390
	<i>US Today</i>	87	58	145
	<i>The Times of India</i>	352	294	646
Total		591	590	1181

Table 6.1: *Pearson Chi-Square*

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	29.971 ^a	2	.000

Table 6 shows mixed results. *China Daily* provided more coverage of socio-political events related to climate change, such as IPCC reports, international agreements, and climate protests, publishing 238 articles on these topics. In contrast, *US Today* and *The Times of India* focused more on natural disaster news, with 87 and 352 articles, respectively.

Overall, the number of articles on extreme weather events and socio-political issues was almost identical, with 591 articles on extreme weather and 590 articles on socio-political topics, showing only a small difference of one article. Based on these findings, Hypothesis 4 (H4) is rejected. This hypothesis suggested that extreme weather news would be less frequent than socio-political climate change coverage in the top three carbon-emitting countries, which is not supported by the data.

The Pearson Chi-Square test yielded a value of 29.971 with a p-value of 0.000, indicating a statistically significant difference in the coverage of these two types of stories.

6. CONCLUSION

Research obtained illustrates those national newspapers from China, India, and the US portray climate change at significantly different levels. The publications in these countries reflect a major reaction to the IPCC's AR6 documentation as per the research conclusions.

Media reports about climate change from China, India, and the United States frequently maintain short formats since fifty percent of their content contains less than 500 words, according to existing findings related to environmental media coverage. The preference for shorter reporting practices affects the depth of public information transmission since studies demonstrate this trend (Barkemeyer et al., 2017; Dotson et al., 2012; Hase et al., 2021).

Major carbon-emitting nations, China and the United States, and India, present distinct patterns in their media coverage about international climate change policies. Media organizations in different countries presented conflicting perspectives when covering environmental issues. Essentially, newspapers within key carbon-emitting nations such as China, the USA, and India preferred to use storylines that reflected the political attitudes within their home institutions. The different approaches to picture framing by *The Times of India* and *China Daily* might explain why these outlets feature higher shares of climate change news than other media outlets, because they follow national policies.

The distribution pattern of climate change news in *China Daily* matched the findings of *US Today* and *The Times of India*, while news articles dominated over editorials, as documented in comparative media scholarship. These patterns highlight the critical role of national media systems, political priorities, and journalistic norms in shaping how climate change is communicated to the public.

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Conflict of Interest


Authors declared NO conflict of interest.


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REFERENCES

- Adams, E. M., & Goffman, E. (1979). Frame Analysis: An Essay on the Organization of Experience. *Philosophy and Phenomenological Research*, 39(4). <https://doi.org/10.2307/2106908>
- Ahmed, A. (2025). “ *Solution Journalism* ” in *Pakistani Print Media : A Comparative Analysis of English Press Coverage of Environmental Reporting in Pakistans*. January.
- Ahmed, A., & Kashif, M. (2025). Climate Change Coverage in Leading English Press of Pakistan Climate Change Coverage in Leading English Press of Pakistan During 2024 : A Comparative Analysis. *International Journal of Social Science Bulletin*, 3(3), 805-813. <https://doi.org/10.5281/zenodo.15081547>
- Ayoub, M., & Ahmed, A. (2024). Decoding Interpersonal Communication Patterns among Climate Disaster Victims: A Case Study of 2024 Glacier Burst Floods in Kumrat Valley, Pakistan. *Human Nature Journal of Social Sciences*, 5(4), 132-142. <https://doi.org/10.71016/hnjss/cjbhww55>
- Ahmed, A., Kashif, M., & Mansoor, S. (2024). Exploring Journalists’ Narratives on Challenges to Climate Journalism in Pakistan. *Human Nature Journal of Social Sciences*, 5(1), 286–294. <https://hnpublisher.com>
- Akram, G., Naseer, M., & Raza, S. M. H. (2023). Immediacy and Journalistic Authority For Reporting Environmental Disasters: Case Study Of 2022 Floods Of Pakistan. *Media Science & Creative Arts*, 3(1), 50–65. <https://doi.org/https://doi.org/10.56596/jjmsca.v3i1.48>
- Antilla, L. (2014). Climate change in the media: reporting risk and uncertainty. *Environmental Communication*, 8(4). <https://doi.org/10.1080/17524032.2014.980107>
- Billett, S. (2010). Dividing climate change: Global warming in the Indian mass media. *Climatic Change*, 99(1). <https://doi.org/10.1007/s10584-009-9605-3>
- Boykoff, M. T., & Yulsman, T. (2013). Political economy, media, and climate change: Sinews of modern life. *Wiley Interdisciplinary Reviews: Climate Change*, 4(5), 359–371. <https://doi.org/10.1002/wcc.233>
- Carvalho, A., & Burgess, J. (2005). Cultural circuits of climate change in U.K. broadsheet newspapers, 1985-2003. *Risk Analysis*, 25(6), 1457–1469. <https://doi.org/10.1111/j.1539-6924.2005.00692.x>

- Climate Action Network. (2022). 1.5°C: A Tipping Point for the Arctic. *Climate Action Network: Resources/Publication*. <https://climatenetwork.org/resource/1-5c-a-tipping-point-for-the-arctic/>
- Climate Watch. (2022). *Historical GHG Emissions*. Webpage. https://www.climatewatchdata.org/ghg-emissions?end_year=2019&start_year=1990
- DARA. (2012). Climate Vulnerability Monitor 2nd Edition. A Guide to the Cold Calculus of a Hot Planet. In *The Climate Vulnerable Forum*.
- Doulton, H., & Brown, K. (2009). Ten years to prevent catastrophe?. Discourses of climate change and international development in the UK press. *Global Environmental Change*, 19(2). <https://doi.org/10.1016/j.gloenvcha.2008.10.004>
- Dubash, N. K., Khosla, R., Rao, N. D., & Bhardwaj, A. (2018). India's energy and emissions future: An interpretive analysis of model scenarios. *Environmental Research Letters*, 13(7). <https://doi.org/10.1088/1748-9326/aacc74>
- Emeka, O., Evelyn, O., Felix, N., Emmanuel, O., Emeka, U., Kelechi, E., Roseline, N., Esther, N., Akunna, T.-A., & Uchenna, A. (2024). Carbon Farming, Carbon Market, Climate Justice and Just Energy Transition in Reducing Carbon Emission in Nigeria (A Review). *THE PROGRESS: A Journal of Multidisciplinary Studies*, 5(3), 10-23. <https://doi.org/10.71016/tp/jw74ry45>
- Entman, R. M. (1993). Framing: Toward Clarification of a Fractured Paradigm SUPER RELEVANT TIL. *Journal of Communication*, 43(4), 51–58.
- Hase, V., Mahl, D., Schäfer, M. S., & Keller, T. R. (2021). Climate change in news media across the globe: An automated analysis of issue attention and themes in climate change coverage in 10 countries (2006–2018). *Global Environmental Change*, 70(August). <https://doi.org/10.1016/j.gloenvcha.2021.102353>
- Hijioka, Y., E. Lin, J.J. Pereira, R.T. Corlett, X. Cui, G.E. Insarov, R.D. Lasco, E. Lindgren, and A. S. (2014). IPCC,2014: Asia, Climate Change: Impacts, Adaptation, and Vulnerability. *IPCC*.
- Human Development Report Office. (2016). Human Development Report 2016 Human Development for Everyone. *United Nations Development Programme*.
- Iftikhar, A., & Shafiq, Z. (2019). The Portrayal of Pak-US Relations in Print Media: An Analysis of War on Terror and Militancy in Pakistan during the Republican and the Democratic Regimes. *Global Regional Review*, IV(III). [https://doi.org/10.31703/grr.2019\(iv-iii\).02](https://doi.org/10.31703/grr.2019(iv-iii).02)
- IPCC. (2023). Summary for Policymakers: Synthesis Report. *Climate Change 2023: Synthesis Report. Contribution of Working Groups I, II and III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change*, 1–34.
- Ibrahim, I. O., Oseiza, L. M., Ali, A. Y., Oloyede, O. I., & Kareem, A. K. (2024). Climate Change Variability and Impacts on Aquifers Performance and Groundwater Production at Akerebiata Area, Nigeria. *THE PROGRESS: A Journal of Multidisciplinary Studies*, 5(1), 37-51. <https://doi.org/10.71016/tp/tx90aa04>
- Javed, N., Sultan, K., & Siddiqua, A. (2024). Framing of Climate Change Issues in Pakistani Media. *Human Nature Journal of Social Sciences*, 5(2), 211-220. <https://doi.org/10.71016/hnjss/ngsj1k60>
- Jaiswal, A. (2017). *India Leads on Climate Action as Trump Exits Paris Agreement*. NRDC. nrdc.org/bio/anjali-jaiswal/india-leads-climate-action-trump-exits-paris-agreement
- Keller, T. R., Hase, V., Thaker, J., Mahl, D., & Schäfer, M. S. (2020). News Media Coverage of Climate Change in India 1997–2016: Using Automated Content Analysis to Assess Themes and Topics. *Environmental Communication*, 14(2). <https://doi.org/10.1080/17524032.2019.1643383>

- Khan, S., Aslam, M. J., Safdar, A., & Tariq, M. (2024). Reporting Climate Change: Factors Affecting Media Coverage of Climate Change in Pakistan. *Qlantic Journal of Social Sciences*, 5(2), 159–168. <https://doi.org/10.55737/qjss.319795411>
- Krippendorff, K. (2022). Content Analysis: An Introduction to Its Methodology. In *Content Analysis: An Introduction to Its Methodology*. <https://doi.org/10.4135/9781071878781>
- Levitt, C., & Gitlin, T. (1981). “The Whole World Is Watching”: Mass Media in the Making and Unmaking of the New Left. *Labour / Le Travail*, 8/9. <https://doi.org/10.2307/25140130>
- Li, B., Shi, H., Yang, D. C., & Peng, M. (2021). Smog pollution, environmental uncertainty, and operating investment. *Atmosphere*, 12(11). <https://doi.org/10.3390/atmos12111378>
- Li, W., Zhao, S., Chen, Y., Wang, L., Hou, W., Jiang, Y., Zou, X., & Shi, S. (2022). State of China’s climate in 2021. *Atmospheric and Oceanic Science Letters*, 15(4). <https://doi.org/10.1016/j.aosl.2022.100211>
- Mahmood, Q. (2022). Framing of Iranian Image in Leading English Press of Pakistan: An Analysis. *Annals of Human and Social Sciences*, 3(III). [https://doi.org/10.35484/ahss.2022\(3-iii\)31](https://doi.org/10.35484/ahss.2022(3-iii)31)
- Mahmood, Q., & Ahmad, K. (2013). Portrayal of the Us in Leading Pakistani Newspapers: an Analysis. *International Journal of Humanities and Social Sciences (IJHSS)*, 2(2), 19–30. http://www.iaset.us/view_archives.php?year=2013&jid=73&jtype=2
- McCombs, M., & Shaw, D. (2016). The Agenda-Setting function of mass media. *Agenda Setting: Readings on Media, Public Opinion, and Policymaking*, 36(2), 17–26. <https://doi.org/10.4324/9781315538389>
- Meehl, G. A., Washington, W. M., Collins, W. D., Arblaster, J. M., Hu, A., Buja, L. E., Strand, W. G., & Teng, H. (2005). How much more global warming and sea level rise? *Science*, 307(5716), 1769–1772. <https://doi.org/10.1126/science.1106663>
- Molotch, H., Neuman, W. R., Just, M. R., & Crigler, A. N. (1993). Common Knowledge: News and the Construction of Political Meaning. In *Contemporary Sociology* (Vol. 22, Issue 5). University of Chicago Press. <https://doi.org/10.2307/2074663>
- Muhammad, H., Altaf, S., & Ali, M. (2024). ALGORITHMIC FILTERING OF CLIMATE MISINFORMATION. *Journal of Sociology & Cultural Research Review (JSCRR)*, December.
- Neuman, W. L. (2013). Social research methods: Pearson new international edition. In *Pearson Education*. <https://www.pearson.com/en-gb/subject-catalog/p/social-research-methods-pearson-new-international-edition/P200000005113/9781292033617>
- NRDC. (2023). *Greenhouse Effect 101*. <https://www.Nrdc.Org/Stories/Greenhouse-Effect-101>. <https://www.nrdc.org/stories/greenhouse-effect-101#gases>
- Nunez, C. (2019). *Carbon dioxide levels are at a record high*. National Geographic. <https://www.nationalgeographic.com/environment/article/greenhouse-gases>
- Olausson, U. (2011). We’re the ones to blame: Citizens’ representations of climate change and the role of the media. *Environmental Communication*, 5(3). <https://doi.org/10.1080/17524032.2011.585026>
- Painter, J. (2015). *Media representations of uncertainty about climate change*. http://westminsterresearch.wmin.ac.uk/15354/1/Painter_James_thesis2015.pdf
- Parker, L., & Blodgett, J. (2012). Greenhouse gas emissions: Perspectives on the top 20 emitters and developed versus developing nations. In *Greenhouse Gas Emissions: Drivers of Intensity and Country Variances*.
- Pralle, S. B. (2009). Agenda-setting and climate change. *Environmental Politics*, 18(5), 781–799.

- <https://doi.org/10.1080/09644010903157115>
- Rashid, S., & Shah, B. H. (2025). *Resilience of Media in Risk Reduction : An Analysis of Pakistani Press through the Lens of Sustainable Development*. 6(1), 85–99.
- Raza, S. M. H., & Shah, B. H. (2024). Global News Coverage of Climate Change: A Comparative Analysis of South Asian Press. *Human Nature Journal of Social Sciences*, 5(3), 275–287. <https://doi.org/10.71016/HNJSS/DE0TP681>
- Riaz, S., & Farhan, M. (2023). Coverage of Climate Change in National Newspapers of Pakistan and its Impact on Audience. *Human Nature Journal of Social Sciences*, 4(3), 21–34. <https://doi.org/10.71016/hnjss/ja7fb507>
- Robinson, J. P., & Tuchman, G. (1981). Making News: A Study in the Construction of Reality. *Social Forces*, 59(4). <https://doi.org/10.2307/2578016>
- Safdar, G., & Butt, A. (2025). Exploring Public Perception about Traditional Media Coverage on Climate Change. *Print, Radio, TV and Film Studies*, 5, 28–42. <https://doi.org/10.71016/prtfs/zby98y69>.
- Sample, I. (2005, June 30). The father of climate change. *Theguardian.Com*. <https://www.theguardian.com/environment/2005/jun/30/climatechange.climatechangeenvironmen t2>
- Schäfer, M. S. (2015). Climate Change and the Media. In *International Encyclopedia of the Social & Behavioral Sciences: Second Edition* (Second Edi, Vol. 3). Elsevier. <https://doi.org/10.1016/B978-0-08-097086-8.91079-1>
- Schäfer, M. S., & O'Neill, S. (2017). Frame Analysis in Climate Change Communication. In *Oxford Research Encyclopedia of Climate Science* (Issue September). <https://doi.org/10.1093/acrefore/9780190228620.013.487>
- Schäfer, M. S., & Painter, J. (2021). Climate journalism in a changing media ecosystem: Assessing the production of climate change-related news around the world. In *Wiley Interdisciplinary Reviews: Climate Change* (Vol. 12, Issue 1). <https://doi.org/10.1002/wcc.675>
- Schäfer, M. S., & Schlichting, I. (2014). Media representations of climate change: A meta-analysis of the research field. *Environmental Communication*, 8(2), 142–160. <https://doi.org/10.1080/17524032.2014.914050>
- Schmidt, A., Ivanova, A., & Schäfer, M. S. (2013). Media attention for climate change around the world: A comparative analysis of newspaper coverage in 27 countries. *Global Environmental Change*, 23(5). <https://doi.org/10.1016/j.gloenvcha.2013.07.020>
- Schmidt, G. A., Annan, J. D., Bartlein, P. J., Cook, B. I., Guilyardi, E., Hargreaves, J. C., Harrison, S. P., Kageyama, M., Legrande, A. N., Konecky, B., Lovejoy, S., Mann, M. E., Masson-Delmotte, V., Risi, C., Thompson, D., Timmermann, A., & Yiou, P. (2014). Using palaeo-climate comparisons to constrain future projections in CMIP5. *Climate of the Past*, 10(1), 221–250. <https://doi.org/10.5194/cp-10-221-2014>
- Semetko, H. A., & Valkenburg, P. M. (2000). Framing European politics: A content analysis of press and television news. *Journal of Communication*, 50(2), 93–109. <https://doi.org/10.1111/j.1460-2466.2000.tb02843.x>
- Sharif, A., & Medvecky, F. (2018). Climate change news reporting in Pakistan: A qualitative analysis of environmental journalists and the barriers they face. *Journal of Science Communication*, 17(1), 1–17. <https://doi.org/10.22323/2.17010203>
- Sharif, K., Sharif, A., Mahmood, Q., Review, C., & Authors, T. (2023). Revisiting Climate Change News Coverage through the Cosmo Journalistic Relational Model – A Case Study of Pakistan. *Media*

and Communication Review, 3(2).

- Taddicken, M. (2013). Climate change from the user's perspective the impact of mass media and internet use and individual and moderating variables on knowledge and attitudes. In *Journal of Media Psychology* (Vol. 25, Issue 1). <https://doi.org/10.1027/1864-1105/a000080>
- Takahashi, B., & Meisner, M. (2013). Climate change in Peruvian newspapers: The role of foreign voices in a context of vulnerability. *Public Understanding of Science*, 22(4). <https://doi.org/10.1177/0963662511431204>
- United Nations. (2022). *What Is Climate Change?* [un.org/en/climatechange/what-is-climate-change#:~:text=Climate change refers to long,like coal%2C oil and gas.](https://un.org/en/climatechange/what-is-climate-change#:~:text=Climate%20change%20refers%20to%20long,like%20coal%20oil%20and%20gas.)
- USEPA. (2024). *Global Greenhouse Gas Overview*. [https://www.epa.gov/ghgemissions/global-greenhouse-gas-overview#:~:text=Emissions by Country,-Source: Data from&text=In 2020%2C the top ten,from deforestation in other regions.](https://www.epa.gov/ghgemissions/global-greenhouse-gas-overview#:~:text=Emissions%20by%20Country,-Source:%20Data%20from&text=In%202020%2C%20the%20top%20ten,from%20deforestation%20in%20other%20regions.)
- Wendorf Muhamad, J., & Yang, F. (2017). Framing Autism: A Content Analysis of Five Major News Frames in U.S.-Based Newspapers. *Journal of Health Communication*, 22(3), 190–197. <https://doi.org/10.1080/10810730.2016.1256453>
- Wilson, K. M. (2002). Forecasting the future: How television weathercasters' attitudes and beliefs about climate change affect their cognitive knowledge on the science. *Science Communication*, 24(2), 246–268. <https://doi.org/10.1177/107554702237849>
- WMO. (2021). *2020 was one of three warmest years on record*. <https://public.wmo.int/en/media/press-release/2020-was-one-of-three-warmest-years-record>
- Wonneberger, A., & Vliegenthart, R. (2021). Agenda-Setting Effects of Climate Change Litigation: Interrelations Across Issue Levels, Media, and Politics in the Case of Urgenda Against the Dutch Government. *Environmental Communication*, 15(5), 699–714. <https://doi.org/10.1080/17524032.2021.1889633>
- Younis, N., & Ahmed, A. (2024). Exploring the Impact of Exposure to Social Networking Sites on Climate Activism among University Students: A Case of Islamabad, Pakistan. *Online Media and Society*, 5(4), 13-21. <https://doi.org/10.71016/oms/dvbb8e20>