

A Comparative Study of Ecological Discourse in News Reports on “Carbon Neutrality” in China, the United States, and India

Jiali Li

University of Shanghai for Science and Technology, Shanghai 200093, China

Email: 162560325@qq.com

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Abstract

As a key strategy to combat climate change, carbon neutrality has become an important issue for countries around the world. China, the United States and India, as the three largest carbon emitters in the world, are in the spotlight for their carbon neutrality progress and commitments. Based on the news reports on “carbon neutrality” in China, the United States and India from 2015 to 2023, this study uses the theory of ecological discourse analysis, combined with the corpus tool AntConc (version 4.3.1) and critical discourse analysis methods, to compare the characteristics of ecological discourse of the media in the three countries from the three dimensions of vocabulary, semantics and discourse, and reveal the positions, strategies and public opinion orientation of the three countries on the issue of carbon neutrality. The study finds that at the lexical level, the media in all three countries emphasized the importance of “carbon neutrality”, but the emphasis was different: Chinese media emphasized “green development”, the U.S. media focused on “technological innovation”, and Indian’s media focused on “sustainable development”. In terms of semantics, China mostly uses affirmative sentences to show determination, the United States often uses complex sentences to express doubts, and India often uses conditional sentences to reflect difficulties. In terms of discourse, China presents a “policy-action-effectiveness” model, the United States has a “problem-controversy-appeal” model, and India has a “problem-dilemma-appeal” model. These differences reflect their respective national interests, which are of great significance for understanding the pluralistic voices in global climate governance and promoting international cooperation.

Keywords

Ecological Discourse Analysis; Carbon Neutrality; Cross-National Comparative Studies; Media

1. Introduction

With the increasingly severe global climate problem, carbon neutrality has become the focus of widespread attention in the international community. As of 2024, 148 countries have pledged to achieve carbon neutrality goals, and 198 countries have

set specific carbon emission policy frameworks[1]. In this context, as the world's top three carbon emitters—China, the United States, and India—collectively account for over 50% of global emissions (IPCC, 2023), their carbon neutrality commitments and narratives hold profound implications for planetary sustainability.

The news media, as an important channel for information dissemination, plays a key role in shaping public perception and guiding public opinion of climate policies. Previous studies have shown that media in different countries are often influenced by their own political, economic and cultural backgrounds when reporting on environmental issues, thus presenting different characteristics of ecological discourse. Environmental discourse in the United States often reflects an “anthropocentric” tendency, emphasizing the idea of “America First”. China, on the other hand, emphasizes the ecological philosophy of “diversity and harmony, interaction and coexistence” [2]. Although some studies have made comparative analyses of media coverage of environmental issues in some countries, there are still relatively few comparative studies on ecological discourse in the coverage of carbon neutrality issues in China, the United States and India[3]. Most of the existing studies focus on the analysis of media discourse in individual countries or regions, and there is a lack of systematic comparison of media discourse in multiple countries[10]. Therefore, it is of great theoretical and practical significance to deeply explore the characteristics, similarities and differences of ecological discourse in the coverage of carbon neutrality by mainstream media, so as to understand their positions and strategies on the issue of carbon neutrality.

2. Literature Review

2.1. Carbon Neutrality

Carbon neutrality, defined as achieving net-zero carbon dioxide emissions by balancing emitted carbon with absorbed carbon (IPCC, 2021), has emerged as a crucial strategy for mitigating climate change. The Paris Agreement (UNFCCC, 2020) marked a significant turning point, with nearly every nation committing to limit global warming to well below 2°C, with efforts towards 1.5°C, effectively requiring widespread carbon neutrality by mid-century[5]. The scientific imperative for achieving carbon neutrality is well-documented in reports by the Intergovernmental Panel on Climate Change (IPCC), which highlight the urgent need for deep decarbonization of all sectors of the economy to avoid catastrophic climate impacts (IPCC, 2021)[6].

Many studies related to “carbon neutrality” news reports have been conducted in a variety of disciplines, including linguistics, environmental studies, and sociology. At the linguistic level, studies have focused on exploring the various factors that influence people's attitudes towards environmental issues. Hepburn et al. (2021) investigated how China's carbon neutrality target in the 14th Five-Year Plan was presented in the news media [7]. Sociological studies have also paid great attention to

the social impact of carbon neutral news. Wang (2024) conducted a cross-country study in which he selected the two developed economies and two developing economies, the United States and the European Union, which have the highest carbon emissions, and the two emerging economies, China and India, which have the highest carbon emissions, as the research subjects[8]. In addition, interdisciplinary research has also shown a booming trend. One study conducted a systematic comparative analysis of media coverage of carbon neutral policies in some economies, exploring in depth the differences in media coverage frameworks[9]. Studies on carbon neutrality news reports that have been published mainly focus on environmental protection policy formulation and its implementation. For example, Zhang (2023) examined how government interventions and public discourses in China's carbon neutrality goal are reflected in news reports, showing that official statements and policy documents often dominate media coverage[10]. In contrast, a comparative study of ecological discourse by Gao (2022) analyzed primary school Chinese textbooks in China, U.S., Singapore and India, revealing that China has the highest level of attention to nature, but lacks attention to natural resources[11]. Eco-linguists value the integration of "carbon neutrality" journalism with public engagement. Feldbusch (2023) explored the role of the media in influencing public perceptions toward carbon capture technologies and found that different ways of presenting the frames used in the media coverage either facilitated or hindered the acceptance of the carbon capture technologies[12]. This highlights the critical importance of accurate media coverage, which can provide the public with comprehensive information, and support climate mitigation strategies.

2.2. Ecological Discourse Analysis

Ecological Discourse Analysis (EDA) is a key branch of the field of ecological linguistics, aiming to analyze language and discourse and reveal their roles in ecosystems. It focuses on how language reflects and influences human actions towards the ecological situation, and how human-ecosystem relations are structured. The theoretical basis of the study is based on Systemic Functional Linguistics (SFL) and Ecolinguistics to understand how language constructs ecological consciousness and guides ecological behavior[13]. In practical research, qualitative and quantitative methods, such as corpus analysis, discourse analysis and case studies, are often combined[14]. In this study, the ecological discourse analysis focuses on the news reports on carbon neutrality in the mainstream media in China, the United States and India, and analyzes them in depth from the lexical, semantic and discourse dimensions, in order to explore the stance, strategy and public opinion orientation of each country on the issue of carbon neutrality. The analysis not only provides an important perspective for understanding the relationship between language and ecology, but also helps to cope with the ecological crisis[15].

3. Results and Discussion

3.1. An Overview of Corpus Findings

These findings underscore significant differences in the discourse construction of media reports across the three countries within the three dimensions of policy, market, and fairness.

Figure 1. The distribution of mainstream media corpora in China, the United States, and India

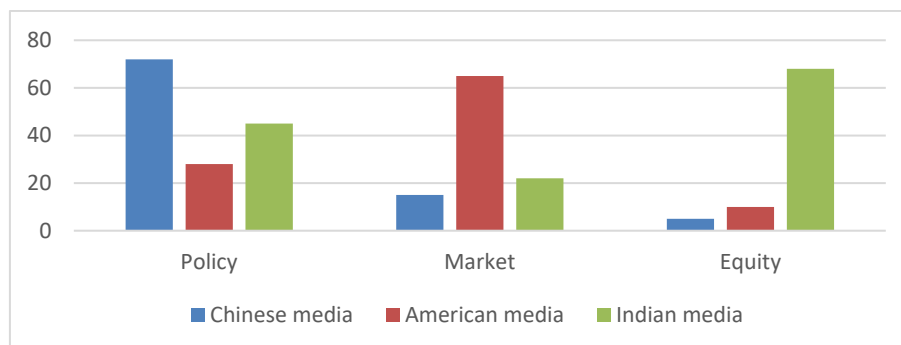


Figure 1 above presents the distribution of the mainstream media corpus in China, the United States and India in the three discourse dimensions of policy, market and equity, and the data show that there is a difference in the ecological discourse around carbon neutrality construction among the three countries. The Chinese corpus pays obvious attention to the policy discourse with a share of 72%, the United States and India have a relatively low share of policy level discussions with 28% and 45% respectively, the United States corpus has market discourse as the dominant theme with a share of 65%, China and India pay less attention to the market dimension with a share of 15% and 22% respectively, and the Indian corpus has the highest proportion of discourses related to the principle of fairness with a share of 68%, while the Chinese and the United States have a much lower occurrence of fairness discourses, respectively. The incidence of fairness discourse is much lower at 5% and 10% respectively. These differences in discourse patterns initially reflect the three countries' national circumstances, development stages, governance models, and positions and interests in the international climate governance landscape.

3.2. Characteristics of mainstream media coverage of carbon neutrality in China, the United States, and India

3.2.1. Lexical Features

The lexical features of news reports can show the usage patterns of common terms and phrases that are closely related to carbon neutrality. Keyword analysis can identify high-frequency words in media reports of a particular country or region to highlight their focus, and there are differences in the highest frequency words among the three corpora. With the help of AntConc (version 4.3.1), a corpus tool, the author obtained the following statistics on the top keywords, frequency, and key collocates related to carbon neutrality from the mainstream media in Chinese People's Daily, the United States' The New York Times, and India's The Times of India

from 2015 to 2023.

The current researcher summarizes the statistical results of top keyword and collocations in the following table:

Table1. Top Keyword and Collocations by Country (2015-2023)

Country	Keyword	Frequency	Key Collocates
China	Green Development	1,203	Government-led (85%), Technology (72%)
U.S.	Carbon Pricing	892	Market Mechanisms (68%), Debate (54%)
India	Climate Justice	1,045	Equitable Funding (79%), South-South (63%)

In the Chinese corpus, “green development” appears 1,203 times, predominantly collocating with “government-led initiatives” (85%) and “technological breakthroughs” (72%). The U.S. corpus shows “carbon pricing” occurring 892 times, frequently paired with “market mechanisms” (68%) and “political debate” (54%). India’s corpus highlights “climate justice” (1,045 instances), closely associated with “equitable funding” (79%) and “developing nations” (63%).

Table 2. Examples of Distinct Lexical Features in Carbon Neutrality Reporting

Feature	People’s Daily	The New York Times	The Times of India
Key Concepts	National Strategy, Ecological Civilization	Climate Crisis, Policy, Transition	Climate Justice, Sustainable Development
Evaluation	Determined, Historic, Achievement	Urgent, Debated, Challenging	Aspirational, Responsible, Development-Focused
Action	Green Transformation, Innovation	Legislation, Regulation, Investment	Renewable Energy, Green Growth
Context	Leadership, Beautiful China	Political Divide, Economic Impact	Equity, Developmental Needs

Table 2 illustrates the examples of distinct lexical feature in carbon neutrality reporting. Key concepts, evaluation, action and context are the four main features. In People’s Daily, the lexical field surrounding carbon neutrality is heavily populated with terms emphasizing national strategy, ecological civilization and leadership. Language is usually integrated into affirmative words (“can,” “must,”), reflecting determination and achievement. Words like “determined,” “historic,” “achievement,” frequently appear. There is a strong focus on “leadership” and “beautiful China,” it often presented as proactive processes. The New York Times’ diverse choice of vocabulary in its carbon neutral related coverage reflects its ongoing political debate. “climate crisis,” “policy,” and “transition” are prominent. The words “urgent,” “debated” and “challenging” emphasize the seriousness of the problem, while “legislation,” “regulation” and “investment” highlight the political conflict. The Times of India’s lexical features often intertwine environmental issues with economic growth. “Climate justice,” “sustainable development,” are common terms. The Times of India frequently uses the terms “aspirational,” “responsible” and “development-focused”, which clearly emphasizes the linkage between economic development and poverty alleviation.

3.2.2. Semantic Features

The semantic features of the news reports are useful for understanding how the concept of carbon neutrality is understood and expressed in China, the United States,

and India.

Table 3. The Key Semantic Features Observed In The News Reports From Each Country

Semantic Feature	People's Daily	The New York Times	The Times of India
Dominant Themes	national strategy, technological innovation, green development, international leadership	political debate, economic impact, scientific urgency, individual responsibility	sustainable development, climate justice, renewable energy, balancing growth
Problem Representation	challenges for national rejuvenation, technological hurdles	immediate climate threats, economic risks, political obstacles	development limitations, international support, complexities
Solution Framing	state-led initiatives, technological breakthroughs, policy implementation	political debate (market vs. regulation), technological innovation	leveraging renewables, sustainable lifestyles, global cooperation
Overall Semantic Tone	optimistic, future-oriented, emphasizing collective action	often conflicted, urgent, emphasizing debate and challenges	pragmatic, focused on equity, balancing development goals

Table 3 is derived from four main semantic features. Firstly, in terms of the dominant themes and focus, reports in People's Daily frequently emphasize themes of national strategy, technological innovation, economic transformation ("green development") and international leadership ("ecological civilization"). The semantic focus is often on collective effort, long-term planning, and the alignment of carbon neutrality with national development goals. In The New York Times, the coverage often centers on themes of political debate, economic impact (job losses/gains, market shifts), scientific urgency, and individual responsibility. The semantic focus frequently highlights conflict, uncertainty, and the challenges of implementing policies amidst partisan divides. Reports in The Times of India tend to focus on themes of sustainable development, climate justice, balancing economic growth with environmental concerns, and the role of renewable energy. The semantic focus often involves positioning India's efforts within global equity frameworks and highlighting domestic challenges like energy access and poverty alleviation.

Secondly, in terms of the problem representation, in China, problems are often framed as challenges to be overcome through technological advancement and systemic reform, linked to achieving national rejuvenation and sustainable development. In United States, problems are frequently framed as immediate threats (climate crisis), economic risks, or political obstacles, often emphasizing the potential negative consequences of action or inaction. And in India, problems are often framed within the context of development limitations, the need for international

support, and the complexities of implementing climate action while addressing poverty and energy demands.

Thirdly, in terms of the solution framing, in China, solutions are predominantly framed as large-scale state-led initiatives, technological breakthroughs, and policy implementations aimed at modernizing the economy and achieving ecological balance. In United States, solutions are often debated politically, ranging from market-based mechanisms to regulatory approaches, with frequent emphasis on technological innovation but also significant discussion on the feasibility and cost. And in India, solutions are often framed around leveraging renewable energy potential, promoting sustainable lifestyles, and advocating for global cooperation and financial assistance to support climate action.

Lastly, in terms of the overall semantic tone, in *The People's Daily*, almost all the sentences about carbon neutrality are optimistic, future-oriented and emphasizing collective action. While in *The New York Times*, the tone is often conflicted, urgent and emphasizing debate and challenges. And in *The Times of India*, when talking about carbon neutrality, the overall tone of the sentence is pragmatic, focused on equity and balancing development goals.

3.2.3. Discourse Features

The characteristics of news report discourse inform the rhetorical strategies and framing techniques used to present carbon neutrality. Table 4 categorizes the main metaphors and their ideological meanings, grouping metaphors into themes ("harmony," "conflict" and "justice") and mapping them to national policy frameworks. As in the case of China, "Harmony" metaphor fits with state-centered governance, "conflict" metaphor reflects partisan divisions in the United States, and "justice" metaphor advocates for solidarity in the Global South in India. These frames can significantly influence public understanding and acceptance of issues.

Table 4. Dominant Metaphors and Ideological Implications

Country	Metaphor	Ideological Alignment
China	Harmony	State-centric governance
U.S.	Conflict	Neoliberal individualism
India	Justice	Global South solidarity

Table 5. Examples of Discourse Features in Carbon Neutrality Reporting

Feature	China	United States	India
Structure	Top-down, Policy-focused, Achievement-oriented	Multi-perspective, Debate-focused, Complexity-focused	Development-focused, Equity-focused, Analytical
Perspective	Official, State-led	Diverse (Scientists, Politicians, Industry, NGOs)	National Interest, Global Context, Development Needs

Rhetoric	Positive Framing, Unity, Authority	Negative, Hedging, Qualification,	Neutral, Justification, Assertiveness
Source Use	Primarily Official Statements	Wide Range of Sources, including experts and opponents	Mix of Official Statements, Experts, Analysts

Table 5 presents four main discourse features in the news reports on “carbon neutrality” from China, the United States, and India. In China, the discourse often follows a top-down structure, emphasizing official statements, government policies, and leadership directives. The discourse style is often formal and authoritative, reflecting the official stance of the state. In the United States, the discourse often follows a multi-perspective or complexity-focused structure, emphasizing diverse perspective (scientists, politicians, industries and so on). There is a higher frequency of direct quotes from diverse sources, reflecting the pluralistic nature of the media landscape. The overall rhetoric is negative and hedging, reflecting scientific uncertainty and political disagreement. In India, the discourse often follows a development-focused and analytical structure, emphasizing global context and development needs. The overall rhetoric is neutral and the source use is mixed with official statements, experts, analysts and so on. The discourse style can range from formal reporting to more analytical pieces, reflecting the complexity of India’s position on climate change.

3.3. Similarities and Differences in the Construction of Ecological Discourse in Media Reports in the Three Countries

This section examines the similarities and differences in how ecological discourse related to carbon neutrality is constructed in the news reports from China, the United States, and India.

3.3.1. Similarities

There are three main similarities in the ecological discourse analyses of news reports on carbon neutrality in China, the United States and India. First, news reports from all three countries recognize the critical role of carbon neutrality for the stability of global ecosystems and the sustainable development of human societies. In the news reports, they all mention the importance of carbon neutrality for combating climate change, reducing greenhouse gas emissions, preserving biodiversity and many other ecological issues. Second, they all focus on the contribution of technological innovation to the realization of carbon neutrality and they all emphasize in their discourse that technological innovation is an important means to achieve the goal of carbon neutrality, believing that technological progress can provide strong support for carbon neutrality. The third similarity is that they all emphasize the necessity of public participation in the process of carbon neutrality. The mainstream

media in the three countries all recognize that the public's energy-saving and emission reduction behaviors in daily life, choosing green travel modes, play an indispensable role in realizing the goal of carbon neutrality.

3.3.2. Differences

First, there are differences in the discourse positions and perceptions of responsibility among the three countries. China's news reports emphasize that it is actively fulfilling its responsibility as a great power under the goal of carbon neutrality. News reports from the United States tend to emphasize its leading position as a scientific and technological powerhouse in the research, development and application of carbon-neutral technologies in ecological discourse. India's news coverage may focus more on emphasizing its own difficulties in balancing economic development and carbon emission reduction, paying more attention to its own efforts and difficulties in the process of carbon neutrality. Second, news reports on carbon neutrality in the three countries differ significantly in terms of discourse focus. China's news reports focus on the country's overall strategic planning for carbon neutrality, green transformation of traditional industries, and the integration of ecological civilization construction with carbon neutrality goals. Third, there are significant differences in the discourse and rhetoric of the news reports in the three countries. Chinese news reports emphasize more on the use of policy-oriented discourses and influential rhetorical techniques, leaders' speeches and vivid case stories to show the determination and effectiveness of carbon neutral actions. U.S. news reports tend to use more professional, data-driven rhetoric in their ecological discourse, emphasizing scientific research to support their views and claims. News reports from India may adopt more critical rhetorical approaches in the expression of ecological discourse, criticizing the shortcomings and double standards of developed countries in their carbon emission reduction actions.

3.4. Reasons Behind These Similarities and Differences

Carbon neutrality is a global issue whose effects transcend national boundaries and pose a common challenge to all countries. This global ecological crisis has led China, the United States and India to see "carbon neutrality" as a key initiative to combat climate change.

The main reason for the differences in the comparative study of ecological discourse in news reports on carbon neutrality in the three countries is the different national interests and stages of economic development of each country. Chinese news reports pay more attention to policy guidance and participation of all people, emphasizing the realization of carbon emission reduction while safeguarding economic development. U.S. news reports emphasize its leading position in its influence on global rule-making. India, as an emerging economy, is facing the double pressure of economic development and carbon emission reduction, emphasizing the responsi-

bility of developed countries in terms of financial and technical support. The second reason is the differences in the history, culture and social values of each country. Chinese news reports are deeply influenced by the values of collectivism and statism, paying more attention to the overall national strategy and policy guidance. News coverage in the United States is influenced by its individualistic and market-driven cultural values, and tends to emphasize the role of market mechanisms in carbon neutralization. News reports in India are influenced by its multiculturalism and religious beliefs, emphasizing the protection of the interests of different classes and groups in the carbon neutral process.

Geopolitics is the most important objective factor causing differences. China emphasizes international cooperation and the principle of common but differentiated responsibilities, calling for joint efforts by the international community. The United States often tries to maintain its global leadership in international carbon neutrality issues, and its news reports evaluate and monitor the carbon reduction actions of other countries, even with certain political purposes. India is more concerned about its own development rights in the international carbon neutrality issue, and its news reports question the double standards of developed countries and emphasize the special interests of developing countries.

4. Conclusion

In this research, the author conducted a comparative study of the ecological discourse on carbon neutrality in People's Daily, the New York Times, and the Times of India from 2015 to 2023. By applying critical discourse analysis and framing theory, it examines the vocabulary, semantic, and discourse levels. It clarifies the similarities and differences and reasons behind them in the construction of ecological discourse among the three countries. All three countries recognize the importance and urgency of addressing climate change and achieving carbon neutrality, there are significant differences in specific discourse strategies, which mainly stem from the different stages of development, political ideologies, cultural values, and historical backgrounds of each country.

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