

/ Air pollution problems in Mongolia: Analyzing frames and dominant speakers in media coverage

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Abstract

As air pollution increases, the problem is widely discussed in science, politics, and the media. Media coverage both reflects and influences political agenda-setting on air pollution. Yet little is known about how air pollution is represented in the media of highly vulnerable countries. To address this gap, this study examines how air pollution is portrayed in the Mongolian mass media, one of the world's most polluted contexts. Drawing on a systematic analysis of 170 newspaper articles, the study identifies dominant causal and solution-responsibility frames. The findings show that Mongolian newspapers emphasize individual responsibility for adapting to air pollution, while international coverage in *The Guardian* highlights collective solutions and political responsibility. Overall, the analysis indicates that politicians—who dominate Mongolian media coverage—tend to marginalize scientific expertise and prioritize short-term, individual-level responses.

Keywords: public policy, framing, air pollution, media representation, Mongolia, dominant speakers

Luftverschmutzungsprobleme in der Mongolei – Analyse von Frames und dominanten Akteuren in der Medienberichterstattung

Zusammenfassung

Mit der Zunahme der Luftverschmutzung wird das Problem verstärkt in Wissenschaft, Politik und Medien diskutiert. Die Medienberichterstattung spiegelt nicht nur die politische Agenda wider, sondern beeinflusst auch die Prioritätensetzung bei der Problembewältigung. Dennoch wissen wir sehr wenig über die mediale Darstellung von Luftverschmutzung in den am stärksten gefährdeten Ländern. Um empirische Erkenntnisse zu liefern, untersucht unsere Studie, wie Luftverschmutzung in den Massenmedien der Mongolei dargestellt wird, einem der weltweit am stärksten verschmutzten Länder. Basierend auf einer systematischen Analyse von 170 Zeitungsartikeln identifiziert dieser Beitrag Verantwortlichkeits-Frames für Ursachen und Lösungen. Unsere Studie zeigt, dass mongolische Zeitungsartikel dazu tendieren, die Verantwortung des Einzelnen zur Anpassung an die Luftverschmutzungsprobleme zu betonen, während Artikel in *The Guardian*, die eine internationale Perspektive auf Luftverschmutzung bieten, kollektive Problemlösungen und die Rolle der Politik hervorheben. Unsere Analyse zeigt, dass Politiker, die in mongolischen Zeitungen als dominierende Sprecher auftreten, wissenschaftliche Expertise oft vernachlässigen und sich auf kurzfristige individuelle Maßnahmen konzentrieren.

Schlagwörter: Öffentliche Politik, Framing, Luftverschmutzung, Medienrepräsentation, Mongolei, dominante Akteure



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1. Introduction

There is substantial evidence that the media coverage of an issue influences its political agenda-setting (Walgrave et al. 2008). Against the backdrop of increasing public debate about priorities in tackling air pollution problems, this paper examines how air pollution is framed in the national and international media. Focusing on Mongolia as one of the most polluted countries, we ask: Who are the dominant speakers in the news media, and what are the main frames of air pollution?

While air pollution affects all countries, the countries and regions in East Asia, Southeast Asia, and South Asia have suffered from the highest annual average of particulate matter (PM_{2.5}) concentration weighted by population (IQAir 2021). According to the World Air Quality Report 2021, the yearly concentration in Mongolia exceeds WHO guidelines by five to seven times (WHO 2021; IQAir 2021), which means that air pollution is one of the most pressing environmental problems faced by Mongolia. As media coverage often reflects prevalent societal problems, we consider air pollution to be a high-value topic in the Mongolian press. At the same time, there is a lack of empirical evidence. The literature on the interactions between the media coverage of environmental issues and public policy has only very recently started to focus on the most vulnerable countries in the Global South (e.g., Agyei-Mensah et al. 2022; Kim et al. 2024; Ong/Diong 2023) shaping social agendas, influencing individuals' actions, and interpreting scientific evidence for the public. With growing scientific understanding of the health, social and environmental consequences of air pollution, there is an urgent need to understand how media coverage frames these links, particularly in Low- and Middle-Income Countries. This paper examines how the Ghanaian print and electronic media houses are covering air pollution issues given increased efforts at reducing air pollution within the country. The main goal of this work is to track the progress of policies to reduce air pollution. We used a qualitative content analysis of selected newspapers (both traditional and online). Hence, we have a very limited understanding of how air pollution problems are reported in newspapers in the countries that are most affected. With our focus on the framing of air pollution in the Mongolian print media, our research thus addresses an important research gap. It contributes to the public policy literature studying the media coverage of air pollution in Asia.

For that purpose, we first review the literature on how mass media frames the public discourse. We then describe our data and methods. This entails introducing the Mongolian case and explaining our focus on articles from *Udriin Sonin* published between 2014 and 2017, when many projects for reducing air pollution were conducted by the Mongolian government and international organizations. To better contextualize the national-level discourse, we also include international coverage of air pollution in *The Guardian*. This is not intended as a blueprint for a methodologically symmetrical comparative study, but rather as a heuristic reference point. *The Guardian* represents a form of international media discourse that allows us to assess the uniqueness or commonality of framing patterns in *Udriin Sonin*. We therefore examine to what extent and in what ways national media framing resembles or diverges from international media framing of the same issue.

In our presentation of results, we argue that both newspapers have paid growing attention to the problems of air pollution. However, we also show that they primarily report on health issues and economic challenges instead of ecological implications, ignoring critical perspectives in environmental science. We suggest that articles in the Mongolian press tend to focus on the responsibilities of individual households and personal adaptation through episodic framing. In contrast, articles in the international press highlight the role of politics through thematic framing. We then discuss whether and what extent this media framing can be explained by dominant speakers determining the salience of air pollution problems in the public discourse.

Theoretical framework

In environmental politics, media and policymaking are closely linked. Mass media has an important role in communicating environmental problems and drawing attention to environmental issues (Bailey 2022; Böcher/Töller 2012; Williams/Schoonvelde 2018). Furthermore, the emergence of environmental policy in developed countries in the 1970s highlighted the role of mass media in political agenda-setting (Downs 1972) as media influences public opinion by choosing which issue to cover and with what frequency (Buchanan, 2023; Crow & Stevens, 2012). Not only is media used to inform the public of new findings and government action, but it is also used by the government to assess public preferences, determine policy action, and inform

stakeholders of policy intentions (Ali/Puppis 2018). In doing so, media outlets might highlight some aspects of an issue while ignoring others (Feldman et al., 2012; McCombs & Guo, 2014). For instance, studying the media coverage of two flood disasters, (Thistlethwaite et al., 2019) have shown that the Canadian media focused more on the short-term impacts of hazards than on underlying policy problems. This selective issue definition arises from several factors, such as the existence of and access to (new) scientific evidence or actors' interests (McQuail 2010), but also framing theory, which is the reference point for our study.

To identify relevant framing theory literature and studies on environmental media in the context of vulnerable countries, we conducted a focused literature search using keywords such as “agenda-setting,” “framing theory,” “air pollution,” “media representation,” and “developing countries” across Google Scholar, Scopus, and Web of Science. Studies were selected based on their relevance to environmental communication, media framing typologies, and speaker influence.

2.1 Framing theory

Framing is not only a central concept of communication studies but also used in policy analysis. Scholars like Entman (1993/2004) or Baumgartner et al. (2009) have linked framing research to the study of policy processes (Baumgartner et al. 2009; Entman 1993, 2004). Entman (2007) demonstrated that media framing contributes to defining a political problem and that media can claim political responsibility or propose a particular remedy. Accordingly, the framing of an issue can both support and neglect certain policies or legislative initiatives (Batta et al. 2013). For instance, a recent study on air pollution media framing in Ghana showed that mass media is playing an increasingly persuasive role in guiding local, national, and international political decisions, shaping social agendas, and influencing individuals' actions (Agyei-Mensah et al., 2022) shaping social agendas, influencing individuals' actions, and interpreting scientific evidence for the public. With growing scientific understanding of the health, social and environmental consequences of air pollution, there is an urgent need to understand how media coverage frames these links, particularly in Low- and Middle-Income Countries. This paper examines how the Ghanaian print and electronic media houses are covering air pollution issues given increased efforts at reducing air pollution within the country. The main goal of this

work is to track the progress of policies to reduce air pollution. We used a qualitative content analysis of selected newspapers (both traditional and online). Media framing may also attribute blame for causing problems and identify responsibilities for fixing them (Holton et al., 2012; Thistlethwaite et al., 2019). It can, therefore, be argued that framing a certain issue in the media affects public attention, agenda-setting, and policy intervention (Baumgartner et al. 2009).

According to Iyengar (1991), there are two types of frames—*episodic* and *thematic*—that determine public perceptions of responsibility for a particular issue (Iyengar 1991). Two attributions of responsibility—*causal* and *solution responsibility*—define the source of a problem and its potential treatment in regard to those actors who have the power to influence that problem (Kim/Willis 2007). If media identify individual blame and encourage individual action to solve a specific problem, the issue is mostly covered by *episodic framing*. In contrast, *thematic frames* are used to describe an issue on the societal level and criticize social problems, such as the unequal distribution of economic resources or the lack of political responsibility for fixing the problem (Boykoff/Boykoff 2004; Iyengar 1991).

It is important to note that the framing of an issue may differ across the national and international media, depending on the political system and cultural setting of a country (Liu & Li, 2017; Sadath & Kleinschmit, 2013) The Times and The Guardian. Furthermore, recent research from developing country contexts—such as Ghana (Agyei-Mensah et al. 2022), Malaysia (Ong/Diong 2023), and China (Kim et al. 2024)—confirms that framing is heavily shaped by speaker dominance, the media environment, and political opportunity structures. These studies emphasize the importance of situating media framing research in high-pollution and Global South contexts.

Drawing on the literature, we expect that the framing of air pollution differs across national and international newspaper coverage and that these differences can be seen in thematic versus episodic frames (H₁). We ask: What are the major frames in the national and international print media coverage of air pollution in Mongolia? As air pollution is a collective action problem, we assume that international media coverage on air pollution will *predominantly use thematic framing* to point to societal-level responsibilities (H_{1a}). We also anticipate that national mass media will apportion individual blame and encourage individual action to solve the air pollution problem through *episodic framing* (H_{1b}).

2.2 The role of dominant speakers in framing air pollution

Framing is a strategic communication tool for *political actors* to influence public opinion and to gain support for their ideas on a certain issue. There are various relevant actors in the field of environmental politics more generally and in air pollution politics more specifically that need to be considered, including notably: representatives from the national political system, representatives from international organizations and treaty secretariats, (international) scientists, representatives of non-governmental and civil society associations, individual citizens, and representatives from business and industry (Chasek/Downie 2020). These actors engage differently in environmental governance as they have different interests and perspectives regarding environmental problems due to their different institutional backgrounds and responsibilities. Furthermore, research has found that the roles of these different actors are not fixed but change over time and across issue areas (O'Neill 2009).

A speaker's higher standing in the environmental discourse allows them to shape the public discourse in line with their interests and viewpoint (Sadath/Kleinschmit 2013). It means that the speaker will appear more often in the media coverage of environmental problems to comment on a certain topic and that their *expertise*—which may be based on scientific evidence but also on other knowledge or even a conspiracy theory—is broadly valued in politics. Thus, views expressed by dominant speakers—including the thematic or episodic framing of an issue—are not a reflection of society, but rather the outcome of journalistic practices and sources' rhetorical tactics (Benson/Wood 2015). The *frequency* of the appearance of speakers is therefore relevant for the analysis of media framing.

In the field of air pollution, there exists very little knowledge on the role of different actors and their representation in media coverage. We therefore ask: Who are the dominant speakers in the newspaper articles? Drawing on the environmental politics literature, we generally consider that the same group of actors will both be involved in air pollution politics in Mongolia and appear as speakers in the mass media (H2). We hypothesize that scientists and representatives from international (governmental and non-governmental) organizations will be dominant speakers in the international media due to their global orientation (H2a), while representatives from the national political system,

members of Mongolian civil society associations, individual citizens, and representatives from local businesses will be dominant speakers on air pollution in the national media (H2b).

3. Materials and methods

This section provides an overview of the case study, selection, collection, and analysis of our data. The selected case study will allow us to cast light on the interactions between the media and politics in a country that is highly affected by air pollution.

3.1. A Case study on Mongolia

Mongolia offers a particularly relevant case for studying air pollution framing in the media due to its extreme seasonal pollution levels and unique urban-rural dynamics. Ulaanbaatar, the capital city, is consistently ranked among the most polluted cities in the world during the winter season. According to the World Health Organization (WHO), exposure to ambient air pollution contributes to over 3,300 premature deaths annually in Mongolia, with respiratory infections and cardiovascular diseases being among the leading health impacts (WHO 2021). A 2019 UNICEF report also highlights that Mongolian children are among the most affected globally, with increased rates of bronchitis, asthma, and pneumonia attributed to high levels of PM_{2.5} and PM₁₀. These effects are particularly severe in ger¹ districts, where coal-burning stoves are widely used.

Beyond health, air pollution imposes serious economic costs. The World Bank (2017) estimated that air pollution-related health impacts cost Mongolia approximately 10% of its GDP in lost productivity and health care expenses. These conditions make Mongolia a compelling setting for exploring how media discourses frame responsibility and propose solutions to a problem of such urgency.

In terms of outdoor pollution levels, Mongolia is ranked 20th out of 117 highly polluted countries (PM_{2.5} concentration = 33.1µg/m³), and Ulaanbaatar was ranked 19th out of 107 capital cities assessed on ambient

1 Ger areas or districts are informal settlements occupied by detached houses and gers, which are Mongolian traditional dwellings. The homes in ger areas are not connected to the central heating system and burn raw coal and/or wood for warmth and cooking.

air quality (PM_{2.5} concentration = 33.8µg/m³) in 2021 (IQAir 2021). Coal is the dominant energy source for indoor heating in ger areas due to its affordability and availability (Government of Mongolia 2019). This causes significant air pollution in Ulaanbaatar, and its citizens suffer from respiratory diseases like pneumonia, bronchitis, asthma, and emphysema (UNICEF 2018).

The Mongolian government and experts have considered a range of policy options for reducing air pollution (Government of Mongolia 2019). For instance, the Mongolian government adopted the Law on Renewable Energy (2007), the Law on Air of Mongolia (2012), the Law on Air Pollution Payment (2010), and the Law on Special Government Funds, including the Clean Air Fund (UNDP 2018). Many projects by the government and international organizations have addressed the air pollution issue and the government received MNT 147 billion (approximately USD 52 million) from donors to reduce air pollution from 2008 to 2016 (UNDP 2018). However, there has been no visible progress in reducing air pollution so far (UNDP 2019). Against the backdrop of this political environment in Mongolia, this case study will allow us to cast light on the interactions between the media and politics in a country that is highly affected by air pollution.

Despite the increasing importance of social media, newspapers remain a trusted and reliable source of information for the public (Press Institute of Mongolia et al., 2022). Hence, newspapers are important media for our case study. The political ideology and form of ownership of Mongolian newspapers are not transparent, but political liberalism is dominant (Press Institute of Mongolia, 2016b). In their publishing, environmental safety and air pollution appear to rank 4 out of 10 among the topics covered most in articles in Mongolian

daily newspapers (Polit.mn, 2018).

With our focus on Mongolia, we wish to contribute to an emerging strand in the literature studying the interactions of politics, science, and media in Asia. The study “Hazy Perceptions” conducted by Vital Strategies (2019) analyzed more than half a million social media posts between 2015 to 2018 in Asian countries, such as India, Sri Lanka, Nepal, Indonesia, Thailand, Mongolia, and Pakistan (Vital Strategies 2019). It found that Asian media tend to ignore the most critical drivers of air pollution, the long-term health impacts of air pollution, and the solutions to air pollution (Vital Strategies 2019). Recently, He, Zhang, and Chen (2020) found that the problem framing of haze coverage by *China Daily* bet-

ween 2000 and 2018 depended highly on officials and agencies (He et al. 2020). These studies emphasize our focus on dominant speakers and our interest in identifying existing causal, problem, and solution frames. Moreover, literature on air pollution in Mongolia focuses on the sources and levels of air pollution (Amarsaikhan et al. 2014) or the relationship between pollution and public health (Jadambaa et al. 2014) by examining laws and policies related to air pollution (Koo et al., 2020). However, there is no study on air pollution in Mongolia in terms of the media coverage of air pollution.

3.2 Data collection and sampling

To analyze how print media frame air pollution in Mongolia, a reputable daily newspaper was selected, i.e., *Udriin Sonin*. The international media is defined as a transnational network for gathering, editing, and distributing news beyond the nation-state paradigm (Olausson 2011). *The Guardian* was selected to present the reference point in an international framework due to: 1) its transnational system for the publication of news, international readership, and focus on issues relevant to a wide range of countries (Flashnewsuk 2009), as well as 2) its focus on climate-relevant publications worldwide (Anderson, 2019). *Udriin Sonin* was chosen as a national newspaper due to its Mongolia-focused network of journalists, its national readership, and the broad circulation of its news within the country with an audience share of 24.9% (Press Institute of Mongolia 2016a). It is one of the first private of the few daily newspapers in Mongolia, thus already has readers ranging from the public to decision-makers. There is no reliable information on its funding and political influence, but there are observations that it tends to follow politically liberal views (Press Institute of Mongolia 2016b).

The intention of this paper is not to compare *The Guardian's* media articles on air pollution with those of the national newspaper. This would not be possible from a methodological point of view, since having an international readership and orientation means that *The Guardian* naturally deals with the problem of air pollution in a much broader and more general way. While *The Guardian* devotes greater volume overall to air pollution, the Mongolian newspaper focuses more specifically on domestic air pollution issues, especially during winter when pollution peaks. The analysis of *The Guardian* serves here as a reference point in a supranational framework to examine the extent to which certain frames and spokespersons are represented both natio-

nally and internationally, as well as the extent to which national coverage in one of the most vulnerable countries resembles or differs from international coverage.

Relevant articles that were published between 2014 and 2017 were obtained by accessing the newspapers' online archive databases (www.theguardian.com and www.dnn.mn). In the selected period, many projects for reducing air pollution were conducted by the Mongolian government and international organizations. One of these projects was the UB Clean Air project, implemented from 2012 to 2017 by the Mongolian government and the World Bank (World Bank Group/ADB 2021). Environmental issues including air pollution came into the spotlight at this time, driven by key events of global relevance, such as the adoption of the 2030 Agenda for Sustainable Development by the United Nations and the conclusion of the Paris Agreement (UN 2015).

Relevant articles in the archives of both newspapers were identified using keywords, including air pollution, smog, air quality, and clean air. This resulted in the total collection of samples consisting of 410 articles for the chosen period from 2014 to 2017. In total, 250 articles were found from *The Guardian*, while 160 articles were found from *Udriin Sonin*.

We used a multi-step sampling and coding process. First, we collected all articles that mentioned air pollution during the study period. We then selected only those articles that contained at least one paragraph substantially focused on air pollution, resulting in 70 relevant articles from *Udriin Sonin* and 100 from *The Guardian* (total: 170). These articles formed the main analytical sample. Articles excluded at this stage typically mentioned air pollution only briefly (e.g., as a side note in a broader environmental article) and did not offer sufficient discursive content to support framing analysis. Therefore, they were not used for code development. Within each article, our unit of analysis was the statement, defined as a sentence or passage where a specific actor discussed a problem, cause, or solution related to air pollution. This unit-level coding approach enabled a more precise and comparative framing analysis across dimensions of responsibility, problem type, and actor roles.

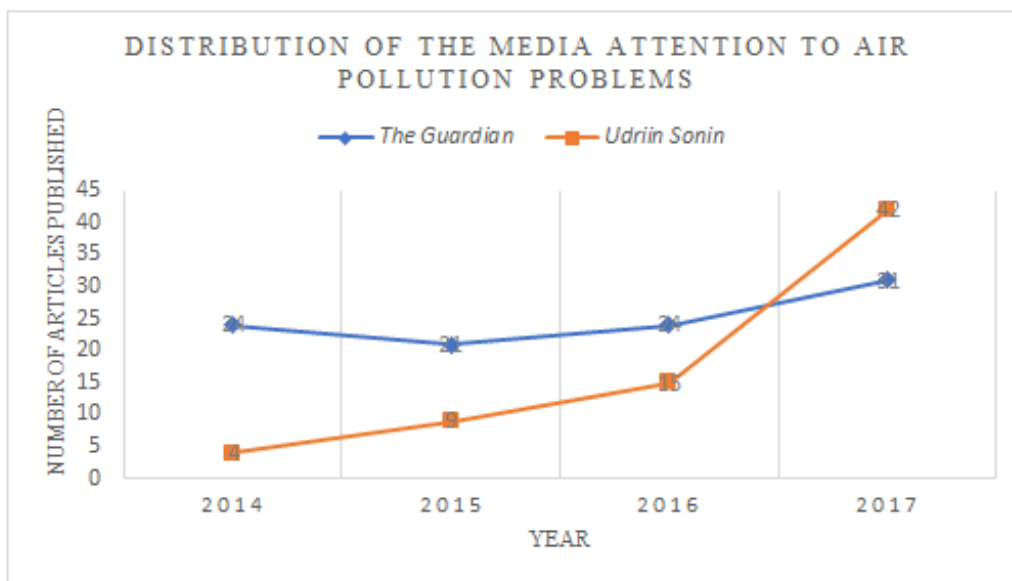
3.3 Data analysis

In order to identify patterns of issues that were covered in the media (and how), we developed a category system to code and interpret the sampled articles. As

suggested in framing research (Entman 2007; Van Gorp 2010), our study undertakes a framing analysis based on content analysis that makes it possible to reveal hidden framing structures by both inductive and deductive coding processes. First, initial categories were created based on the state of the art in literature on the framing of environmental problems. Second, these *deductive categories* were used to review 20 articles from each newspaper. This sample size is sufficient to capture a diverse range of perspectives and content, which is essential for developing additional *inductive categories*. Third, the initial coding scheme was reexamined, and inductive codes were developed for clarification. Fourth, the final code scheme was created on the basis of this review.

Our final coding scheme entails three categories. The first category considers the articles' publication dates. The second category included our unit of analysis, i.e., the statements made in the articles. Statements refer to what has been said about air pollution by a certain speaker and comprise sometimes only one sentence, sometimes one paragraph. We coded 432 statements in total. Then, at the statement level, each speaking actor was coded as speakers that attribute to the causal and solution responsibility. The speakers were divided into the following categories: politico-administrative system (e.g., politicians and administrators), journalist, scientist, association (e.g., non-governmental organization and expert), individuals (e.g., citizens, victims, leaders of civil society), enterprises, interstate organizations (EU, UN, WHO). The third category concerns the framing of air pollution issues. Following Entman (1993), who claimed that the key functions of framing are to select and highlight elements to construct an argument about problems, their causation, evaluation, and solution, as well as Holton et al. (2012), who found that media may also attribute responsibility for the causes and solutions of a problem (Holton et al. 2012), we code causal responsibility and solution responsibility in regard to the overall framing of air pollution as an ecological, economic, societal, and health problem. This helps us to identify and compare the thematic and episodic framing as explained in section 2.2. Two coders first checked whether or not each frame was presented in each article. Then, the number of mentions of each frame and actor was determined. To assess the reliability of the coding across the two coders and inter-coder reliability, Krippendorff's alpha was calculated based on a sample of 100 articles from each coder. The final inter-coder reliability was $\alpha = 1.0$ for problem, $\alpha = .83$

Figure 1 Distribution of the media attention to air pollution problems from 2014 to 2017, by number of articles and published year



Source: Author's own analysis based on newspaper articles (2014–2017).

for individual causal responsibility, $\alpha = .87$ for societal causal responsibility, $\alpha = .94$ for individual solution responsibility, and $\alpha = .88$ for societal solution responsibility. Reliability for the speaker variables ranged from $\alpha = .81$ to $\alpha = .96$. Thus, all variables achieved good levels of reliability as alpha was greater than 0.80 (Krippendorff 2004).

4. Results

In the following, we present our findings from the analysis of the framing of air pollution along three major frames and the role of dominant speakers according to our hypotheses.

4.1 Framing air pollution

Hypothesis 1 states that the representation of air pollution in national and international newspaper coverage differs and that these differences can be seen in thematic and episodic framing (H1). Furthermore, international media coverage (*The Guardian*) will predominantly use thematic framing to highlight societal-level responsibilities for air pollution as a collective action problem (H1a). The national mass media (*Udriin Sonin*) will use episodic framing to assign individual blame and promote individual measures to solve the air pollution problem (H1b). The analysis of articles in the selected newspapers shows that both *The Guardian's* and *Udriin Sonin's* reporting on the issue of air pollution increased

between 2014 and 2017 (see fig. 1). The amount of news stories on air pollution in the national media grew significantly after 2016 and reached a peak in 2017. This can be explained by the end of the first phase of the UB Clean Air project in 2017. Information from the project reports was released by the media from 2016 to 2017. Furthermore, a media campaign was organized before the government's approval of the National Program on Air and Environmental Pollution in 2017. Figure 1 also shows that international media coverage of the air pollution problem in general slowly increased over the study period. Yet air pollution in general was a much more prominent issue in the media coverage by *The Guardian* compared to that by *Udriin Sonin* until 2016. This is surprising considering the long-lasting and severe air pollution problems and high vulnerability of people in Mongolia. In the national media, air pollution only gained high news value very late—at a point when politicians could reveal their first results and demonstrate their problem-solving capacity.

In order to understand the major frames in the national and international print media coverage of air pollution, we first investigate: *How did national and international media present the air pollution problem? To answer this question*, the issue salience of air pollution's impacts on human health, society, ecology, and the economy in both newspapers' coverage was examined. First, we identified and selected articles that addressed the graveness and urgency of the air pollution issue (84% of all collected articles from *Udriin*

Table 1 Frequency of problem codes in identified statements addressing air pollution as an urgent and serious problem

Problem	Udriin Sonin N=91 (100%)*	The Guardian N=152 (100%)*
Health problem	45 (49%)	65 (43%)
Deaths/mortality	12 (13%)	35 (23%)
Cardiovascular disease	7 (8%)	17 (11%)
Respiratory problems	26 (28%)	13 (8%)
Ecological problem	2 (2%)	24 (16%)
Acid rain	-	5 (3%)
Problems for biodiversity	2 (12%)	10 (6%)
Problems for animals	-	9 (6%)
Social problem	15 (18%)	32 (21%)
Family separation	7 (8%)	5 (3%)
Threatening food supply	-	6 (4%)
Human rights crisis (vulnerable people as victims)	3 (3%)	12 (8%)
Poverty	5 (5%)	9 (6%)
Economic problem	29 (32%)	31 (20%)
Decreasing GDP	7 (8%)	10 (6%)
Costs of health on individuals	9 (10%)	12 (8%)
Costs of protective measures	13 (14%)	9 (6%)

* N means the basic population of identified statements addressing air pollution as a problem

Source: Author's own analysis

Sonin and 76% from *The Guardian*). These proportions formed the population for the next step of our analysis, in which we coded 91 statements (in 70 articles) in *Udriin Sonin* and 152 statements (in 100 articles) in *The Guardian* elaborating on the problems associated with air pollution to analyze them in terms of mentioning the specific areas impacted by air pollution: health, ecology, economy, and social aspects. Table 1 summarizes these findings and presents the frequency of problems associated with air pollution. It shows that human health was the most prominent issue in both newspapers, which mainly entailed how the consequences of air pollution affect different types of diseases.

One of the most prominent health problems that was covered in *The Guardian* was death or mortality attributable to air pollution (23%), followed by cardiovascular (11%) and respiratory problems (8%) (Table). Surprisingly, the issue salience of health problems in *Udriin Sonin* is different. These statements primarily mention respiratory problems (28%), followed by death/mortality (13%), and cardiovascular disease (8%).

Economic problems (32% of the national statements and 20% of the international statements) and social problems (18% of the national statements and

21% of the international statements) follow as the next most prominent issues being highlighted in connection to air pollution (Table). By contrast, ecological problems appear only as a minor issue. Surprisingly, only 2% of the national statements and 16% of the statements in *The Guardian* mention the short- and long-term environmental implications of air pollution, such as biodiversity loss.

How did national and international media present the causes of air pollution? Our study highlights that the national media focused more on individual-level causes than on societal-level attributions. For a more detailed picture of the framing of causal responsibility for air pollution,

Table provides a list of the absolute and relative number of statements attributed to different causal responsibilities.

The individual cause most frequently mentioned by the national newspaper was cooking and heating with an inefficient stove (19%), followed by cooking and heating with unclean fuels (14%), and increased use of cars (10%), stating, for instance:

People who moved from rural areas to the capital are expanding the ger areas and increasing the number

Table 2 Frequency of causal responsibility codes

Causal responsibility	Udriin Sonin N=83 (100%)	The Guardian N=135 (100%)
Individual level	46 (55%)	49 (36%)
Increased use of cars	8 (10%)	16 (12%)
Cooking and heating with unclean fuels	12 (14%)	14 (10%)
Cooking and heating with inefficient stoves	16 (19%)	10 (7%)
Waste burning	3 (4%)	6 (4%)
Lack of education about how to protect oneself from air pollution	7 (8%)	3 (2%)
Societal level	37 (44%)	86 (64%)
Weather/geography	8 (10%)	7 (5%)
Poor infrastructure	7 (8%)	9 (7%)
Urban sprawl	7 (8%)	12 (9%)
Climate change	-	8 (6%)
Poor public transportation	6 (7%)	18 (13%)
Dust and construction	1 (1%)	5 (4%)
Poverty	5 (6%)	9 (7%)
Industrial development	2 (2%)	12 (9%)
Wood burning	1 (1%)	6 (4%)

Source: Author's own analysis

of chimneys causing the air pollution of Ulaanbaatar. They do not have a settlement permit, and their arbitrary settlement interferes with the management of the city. (Munkhtsetseg 2017; Udriin Sonin)

The number of people in ger areas has indeed been growing rapidly over the last decade, causing increasing social tensions between old and new residents of Ulaanbaatar. The topic is therefore very prominent in the national media. In the article cited above, people who settle without permits are blamed for worsening air pollution: they are accused of settling in ger areas and using pollutant stoves for cooking and heating. Rather than questioning the city's management, which has failed to tackle the settlement or the air pollution problem in the capital of Mongolia, the article focuses on individual behavior and episodic events. The article draws on experiential knowledge about coal-burning and exploits social tensions in highly populated cities. Individuals who come to build a life in the city are held responsible for causing air pollution instead of questioning the long-term housing and air pollution strategy of the city administration and the government. This framing favors national politicians who have an inter-

est in diverting public attention away from governance failure and toward individual responsibility.

In contrast, *The Guardian* addressed social causes (64%) more than individual-level attributions (36%): The most frequently mentioned societal-level cause in *The Guardian* was poor public transportation (13%), followed by urban sprawl (9%), and industrial development (9%). Weather/geography (5%), poor infrastructure (7%), climate change (6%), wood-burning (4%), and dust/construction (4%) were mentioned less often (Table). The following quote illustrates this focus on societal causes:

The new data, drawn from city and academic records, shows a rapid deterioration in air quality as low-income cities grow unchecked and populations become unable to escape clouds of smog and soot from transport, industry, construction sites, farming and wood-burning in homes. (Vidal 2014; The Guardian)

In contrast to the statement from *Udriin Sonin* (Munkhtsetseg 2017), this statement from *The Guardian* adopts a less accusatory and more scientific tone with its reference to new data and academic records. The focus is on the broader theme of air pollution. It addresses the problem of uncontrolled settlements

Table 3 Frequency of solution responsibilities

Solution responsibility	Udriin Sonin N=102 (100%)	The Guardian N=145 (100%)
Individual level	57 (56%)	42 (29%)
Reducing coal use	5 (5%)	8 (5%)
Reducing car use	8 (8%)	12 (8%)
Better-grade fuels	8 (8%)	7 (5%)
Clean cooking stoves	12 (12%)	6 (4%)
Air filters	9 (9%)	2 (1%)
Wearing masks	15 (15%)	7 (5%)
Societal level	45 (44%)	103 (71%)
Monitoring air pollution	5 (5%)	15 (10%)
Vehicle emissions and testing	4 (4%)	5 (3%)
Traffic restrictions (e.g., odd-even car-rationing)	10 (10%)	21 (14%)
Diversifying energy resources	1 (1%)	9 (6%)
Increased taxes on air pollution resources	-	-
-	13 (9%)	-
Improving migration system	2 (2%)	-
Closing power plants, factories	3 (3%)	8 (6%)
Improving public transport system	5 (5%)	13 (9%)
Green initiatives	10 (10%)	7 (5%)
Improving environmental laws/standards	5 (5%)	12 (8%)

Source: Author's own analysis

and wood-burning stoves, which is a major cause of social tension in Mongolia, but also mentions the role of industry, transport, construction, and farming in regard to air pollution. The latter can be described as societal causes that are administered by the municipal or national government. In the article, people living in fast-growing cities are portrayed as being trapped in the smog and suffering from the poor air quality.

How did national and international media present the solutions to air pollution? Table 3 below shows that solutions to air pollution problems at the individual and societal level were suggested in 102 statements in *Udriin Sonin* (across 54% of all 70 articles selected for this study) and in 145 statements in *The Guardian* (across 54% of all 100 selected articles). We find that the national newspaper presents individual-level solutions (56%) more frequently than societal-level solutions (44%) (table 3). The national media mentioned wearing masks (15%) most frequently as an individual-level solution, followed by clean cooking stoves (12%) and air filters (9%). Traffic restrictions (10%) and green initiatives (10%) were mentioned more often as a solution for air pollution at the societal level in *Udriin Sonin*.

The following statement from an article in *Udriin Sonin* illustrates how societal-level solutions linked to the broader theme of air pollution, like promoting renewable energies and making the construction sector less polluting, are downplayed because they are considered too time-consuming. Hence, the article urges individuals to adapt to the problem (by wearing masks) and argues for individual solutions (using electricity instead of fuels).

Investments in the renewable energy sector and the construction of apartments in the ger districts are great ways to battle air pollution, but that will take time. The current situation needs to be addressed. Despite being exposed to significant amounts of air pollution, the Mongolian public has neglected the idea of combating outside air pollution themselves, such as by wearing masks and using electricity instead of raw fuels. (Davkhardavaa 2017; Udriin Sonin)

In contrast, societal-level solutions (71%) appeared much more frequently than individual-level solutions (29%) in *The Guardian* (Table). These included traffic restrictions (14%), increasing taxes on sources of air pollution (9%), and improving the public transport

Table 4 Standing of actors

Speakers	Udriin Sonin N=143 (100%)	The Guardian N=253 (100%)
PAS (politicians and administrators)	45 (31%)	26 (10%)
Journalists	28 (19%)	50 (20%)
Scientists	8 (5%)	53 (21%)
Associations (NGOs, experts)	20 (14%)	45 (18%)
Individuals (victims, citizens, leaders of civil groups)	12 (8%)	35 (14%)
Enterprises	2 (1%)	5 (2%)
Interstate organizations (UN, EU)	22 (15%)	31 (12%)
Others	6 (4%)	8 (3%)

Source: Author's own analysis

system (9%). The link between national politics and the international media thus appears less tight and the orientation is toward an international readership that is familiar with other countries' approaches to tackling air pollution and interested in scientific evidence.

Comparing the framing of air pollution in international and national newspapers, we have shown that the media coverage differs (H1). Citizens are blamed for causing air pollution and urged to solve the collective problem individually by making different personal choices (without reflecting much on their actual ability to do so within the given societal structures) in *Udriin Sonin*. This media reporting can be understood as episodic framing (H1b). In contrast, *The Guardian* uses more thematic framing, stressing the societal-level causes of and solutions to air pollution and referring to scientific evidence rather than individual experiences (H1a).

4.2 Dominant speakers in framing

After presenting our results on the framing of air pollution, we ask: *Who are the main speakers in the national and international print media coverage of air pollution?* Hypothesis 2 states that the same group of actors will both be involved in air pollution politics in Mongolia and appear as speakers in the mass media (H2). Scientists and representatives of international (governmental and non-governmental) organizations will be the dominant speakers in international media due to their global orientation (H2a). Representatives of the national political system, members of Mongolian civil society associations, individual citizens, and representatives of local businesses will be dominant speakers on air pollution in national media (H2b).

Table 4 summarizes our findings on the standing of actors in statements on air pollution. 143 relevant statements were assessed in *Udriin Sonin* and 253 statements in *The Guardian*. Our analysis indicates that politicians and administrations dominate the national news coverage (approximately 31%), followed by journalists (19%) and interstate organizations (15%) (Table).

Our findings indicate that political actors as the dominant speakers in the national newspaper's framing of air pollution in terms of it being an individual issue. This complements our findings as presented in section 4.1. For instance, the former Minister of Environment, Green Development, and Tourism, Oyunkhorol Dulamsuren, urges individual responsibility for the causes of and solutions to air pollution:

80% of Ulaanbaatar's emissions come from heating stoves for 198,000 households in ger areas. They consume more than a million tons of coal a year and emit smoke. Therefore, in order to reduce air pollution, it is important to ensure that ger-area households stop using raw coal and use processed coal. (DNN 2016; Udriin Sonin)

In the article cited above, the ger-area households were blamed for causing air pollution and encouraged to take responsibility for solving it.

In the statements analyzed from *The Guardian*, scientists (21%) have a dominant standing, followed by journalists (20%), associations (18%), and individuals (14%) (Table). Associations, such as environmental NGOs, experts in the field of the environment, and health research institutions are mentioned in *The Guardian's* articles, and the newspaper refers to members of international organizations, as illustrated in the following example:

The World Health Organisation has issued a stark new warning about deadly pollution levels in many of the

world's biggest cities, claiming poor air quality is killing millions and threatening to overwhelm health services across the globe [...]. (Helm 2016; The Guardian)

We can see that articles in the international media refer to the authority of internationally recognized actors, like international organizations (here: the WHO) or scientists to stress the urgency of the air pollution problem. In this statement, a speaker from the WHO makes it possible for the article to adopt a broader perspective on the air pollution problem and to indicate global implications and structural causes (overwhelmed health services). In other statements, speakers from associations and individual speakers contrast the perspective of the national government with the views of the civil society.

The different standing of speakers in both newspapers can be linked back to the different framings of air pollution (H2). Politicians are dominant in the national newspaper (H2a), stressing individual causal and solution responsibility, while the international newspaper points to structural problems and the urgent global implications of air pollution, which are expressed by internationally recognized speakers, such as scientists (H2b).

5. Discussion

This study builds on the premise that the framing of an issue in the media has a potentially significant impact on policymaking (Baumgartner et al., 2009). Therefore, this study aimed to examine how two major newspapers presented the problems, causes, and solutions related to air pollution.

Framing air pollution

We highlighted that both newspapers' coverage did not pay much attention to the ecological problems linked to air pollution. This is rather surprising considering the overall consensus in climate research pointing to the negative immediate consequences of air pollution, such as acid rain and crop losses, and highlighting the existential threats of reaching tipping points that can cause long-term climate impacts, which result, among others, from air pollution (IPCC, 2014). One possible explanation is the limited understanding of scientific evidence and complex ecological phenomena by journalists and policymakers (Ungar 2000). Other studies have found that environmental journalists who cover and report on environmental issues in

developing countries face limited information and reliable sources (Carmody 1995). Another explanation for the omission of ecological problems is that the different frames of an issue in the media are influenced by the actors who tend to use media as a tool to encourage policy intervention in their favor (Ayogu, 2013). Accordingly, actors in both newspapers focus more on immediate health problems, economic challenges, and social problems, which generally have more public support and which are often higher on the political agenda than ecological issues and environmental policy.

As illustrated in table 5 below, the frames of air pollution differ between *Udriin Sonin* and *The Guardian*, with a dominance of political actors as speakers in the national media and individual (scientific and technical) experts as speakers in the international media. More specifically, articles in *Udriin Sonin* explained air pollution as an individual problem that can be solved by individual adaptation, whereas articles in *The Guardian* describe air pollution as a societal problem that requires collective action and adequate political decision-making (Herman & Chomsky, 1988). Furthermore, although the national media quite often focused on household pollution, including cooking and heating with inefficient stoves and unclean fuels, as a leading cause of air pollution (Table), it was less likely to suggest *preventive* measures to air pollution, such as reducing the use of coal or using clean cooking stoves. Instead, they focused on *individual adaptation*, such as wearing masks (Table). Our analysis indicates that the unbalanced emphasis on individual responsibility is more significant in the national newspaper than in the international newspaper (H1b). Admittedly, this focus on individual-level solutions (e.g., wearing masks, switching fuels) partially reflects scientific evidence: according to the World Bank (2017), approximately 80% of Ulaanbaatar's winter air pollution is caused by household coal-burning stoves in ger districts. However, international sources emphasize that this cannot be resolved through individual action alone and highlight the structural and systemic dimensions of the crisis. Again, this can be related to the different actors speaking in both newspapers. A possible explanation for this framing is that responsibility is taken away from national politicians. Politicians (who are the main speakers cited) have no interest in being held responsible for the health system that international media describes as a main cause of air pollution-related problems among people. Societal solutions are thus considered too radical by the national news, either politically or

Table 5 Different frames of air pollution between *Udriin Sonin* and *The Guardian*

Newspapers	Problem	Causal responsibility	Solution responsibility
	<i>What is wrong?</i>	<i>Who/what is responsible for the problem?</i>	<i>Who/what is responsible for the solution?</i>
<i>Udriin Sonin</i>	1. Health problem (49%) 2. Economic problem (32%) 3. Social problem (18%) 4. Ecological problem (2%)	- Individual causal responsibilities (55%) e.g., inefficient stoves (19%) as main cause - Individuals as causers (32%)	- Individual solution responsibilities (56%) e.g., wearing masks (15%) as main solution - Individuals as solvers (25%)
<i>The Guardian</i>	1. Health problem (43%) 2. Social problem (21%) 3. Economic problem (20%) 4. Ecological problem (16%)	- Societal causal responsibilities (64%) e.g., poor public transportation (13%) as main cause - Government and politicians as causers (29%)	- Societal solution responsibilities (71%) e.g., traffic restrictions (14%) as main solution - Political actors as solvers (23%)

Source: Author’s own analysis

economically. As a consequence, they tend to be excluded or sidelined (as in the quotation above) in favor of individual adaptation measures that appear less drastic, time-consuming, and controversial (Herman & Chomsky, 1988). This framing strategy by political speakers is not new but has also been identified in other cases and is therefore important for understanding public debates on social problems (Kim/Willis 2007).

Despite air pollution ranking among the top topics of concern among the Mongolian public and media reporting according to national surveys (e.g., Polit.mn 2018), the number of articles we identified in *Udriin Sonin* over four years was relatively limited. This discrepancy can be attributed to the seasonality of the issue—media coverage tends to spike only in the winter months when pollution is at its worst—and to patterns of politicized and donor-driven agenda-setting. Coverage often intensifies when linked to government programs or international campaigns, indicating that editorial attention is often event-driven rather than consistently proportional to the issue’s objective severity.

Notably, our analysis reveals a discursive asymmetry: while individuals are frequently framed as responsible for causing or solving air pollution—particularly by political actors—they are rarely featured as speakers themselves. When individuals do appear, they primarily describe personal experiences or health concerns rather than expressing policy positions or critiques. This suggests that individuals are often “spoken about” rather than allowed to “speak for themselves,” which reinforces top-down, episodic framing and limits the inclusion of bottom-up perspectives in the public discourse.

As hypothesized (H1a), *The Guardian* tends to use *thematic framing*. This results in increasing support for broader political, economic, or environmental solutions at the international level. However, although scientific evidence highlights air pollution as a collective problem, *Udriin Sonin* is more likely to use *episodic framing* when reporting on air pollution (H1b). This results in decreasing support for broader political, economic, or environmental solutions. The national media mentions individuals as solvers and causers, while international media more frequently mentions political actors as causers and solvers. Our hypothesis 1a is therefore only partly confirmed as we have seen very little empirical evidence for thematic framing of air pollution at the national level (H1a).

5.1 Factors influencing framing

As argued before, the influence of actors with powerful political interests is one explanation why the framing of air pollution in a national newspaper differs from that of an international newspaper (H2). We have shown that political actors (politicians and administrators) are the most influential speakers in *Udriin Sonin*, and they framed the problem as an individual issue (Table) (H2a). In line with previous studies, it can be argued that the media discourse serves the interests of politicians who seek to influence public opinion in order to mobilize voters in their favor (Kleinschmit/Krott 2008). For that purpose, they present the news and related information in a specific order that supports their policy interests. This argument is supported by Benford and Snow (2000) who contend that framing is a strategic and goal-oriented process in which actors frame a certain issue in a discourse for the benefit of their own interests.

Accordingly, it is not surprising that air pollution articles were published in the Mongolian newspaper when the government announced new anti-pollution policies or announced health-related reports. At those moments, political actors provided journalists with a large amount of information and news material that emphasized individual causes of and solutions to air pollution, ignoring scientific evidence and producing *divergent expertise* (Goldstein 2016). In these reports, the victims are blamed as the causers of air pollution. In this way, the residents of the ger areas become not only the primary victims of air pollution, but also its main causers. This framing is beneficial for political actors who depend on a positive public reputation and who must justify why their political actions have so far failed to tackle the problem of air pollution. By blaming someone else (individuals) and framing air pollution as an issue requiring individual solutions, political actors can show that they have identified the problem and contribute to its solution (through reduction-advice to the public) without engaging in further—more complicated—political measures. In contrast, scientists, associations, and interstate organizations are the major speakers in *The Guardian* (Table) (H2b). They shape the media discourse surrounding air pollution by focusing on scientific solutions and policy change for both mitigation and adaptation. This also means that governments and administrators are often blamed for not preventing an environmental crisis. International newspaper articles hold political actors responsible for (not) fixing air pollution problems.

Building on these observations, we identify three interrelated structural factors influencing framing:

Media ownership and political alignment: According to the Press Institute of Mongolia (2016b), Mongolian media ownership is nontransparent, though most newspapers tend to lean toward liberal political views. This makes it plausible that newspapers like *Udriin Sonin* are indirectly aligned with government positions, particularly through their reliance on politicians as primary sources. The dominance of episodic frames and absence of critical societal framing reflect this alignment.

Political economy constraints: Our findings suggest that media timing and content are shaped by political opportunities. The coverage of air pollution in *Udriin Sonin* peaked in 2016/2017, matching major government communication efforts and project milestones. As air pollution was framed in ways that deflect responsibility from institutions, this suggests media

content was conditioned by the need to demonstrate responsiveness without advocating structural reform. This supports previous scholarship on strategic media framing by elites (Benford/Snow 2000; Kleinschmit/Krott 2008).

Influence of international organizations: In *The Guardian*, international actors like the WHO and the World Bank appeared as key speakers. These actors offer expert knowledge and systemic perspectives, facilitating thematic frames that present air pollution as a collective challenge. Their influence (12% of speakers in *The Guardian*) helps explain why international media focused more on governance, scientific evidence, and transnational comparisons. This aligns with prior literature emphasizing the role of international organizations in agenda-setting and media salience.

Based on this discussion, our study draws the following conclusions, which are supported by previous studies such as Kim et al. (2024), Verloo (2016), and Entman (2004). First, if political actors are dominant speakers in the media, the main framing of the issue is episodic. Second, if individuals are more involved as speakers, thematic framing is more common. Third, when media reporting is predominantly episodic, individuals are held responsible to a greater degree. In contrast, when thematic framing is used, political actors are more likely to be held responsible for causes and solutions.

6. Conclusions

This study contributes to the literature considering the interaction between public policy and mass media on the environmental science-based problem. While existing studies focused on the cultural differences between developed countries recognizable in their media coverage of environmental pollution, this study identified differences between national and international media coverage of air pollution based on the interests of dominant speakers. Our analysis is one of the few empirical studies considering the political agenda-setting of air pollution in Mongolia in terms of the interaction between public policy and media coverage.

Nonetheless, it should be noted that this study has several limitations. The first limitation is its sampling. Comparing two newspapers at the national and international levels does not allow us to generalize results as they may not be representative of all news outlets at each level. The inclusion of *The Guardian* is not intended as a blueprint of a real comparative analy-

sis; rather, *The Guardian* offers us a foil that is more representative of the international discourse and allows us to better localize and assess the framing in *Udriin Sonin*. Second, the coding was not always easy because one article could contain more than one theme, for example, air pollution as an economic and a social problem. Therefore, we analyzed specific statements within preselected articles. Thirdly, there is a limitation in the fact that we analyzed daily newspapers and not other media such as radio, television, or the Internet. While the Internet did not play the same role in the study area and period as it does today, there is a risk of overlooking important messages when focusing on daily newspapers. Despite these limitations, we consider our analysis to be valuable: on the one hand, it is in line with the approach of similar media analyses in the Global South (Sadath/Rahman 2016; Sadath et al. 2013), and on the other hand, major daily newspapers are still a significant factor in political opinion-forming (Peterson 2021). Moreover, the analysis of Mongolia in particular is innovative, as there have been hardly any studies on this country, even though it is particularly affected by the environmental problem of air pollution.

To further explore how air pollution is framed and how a newspaper's political leanings and dominant speakers' interests potentially influence the framing process, a survey could be conducted among journalists and editors who cover air pollution issues. This would help scholars to better understand how the factors, political tendency, and dominant speakers are intertwined in news framing and how journalists perceive these forces. Furthermore, the findings from our study on air pollution could be used as a starting point for a systematic study of media frames in environmental issues, i.e., covering not only the prominent issue of air pollution but also other prevailing problems, such as water pollution or biodiversity loss.

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