






# Geopolitical currents and contested science: Chinese media framing and politicization of the Fukushima nuclear wastewater discharge

Liqian Wu & Xiaoxiao Cheng


To cite this article: Liqian Wu & Xiaoxiao Cheng (16 Feb 2026): Geopolitical currents and contested science: Chinese media framing and politicization of the Fukushima nuclear wastewater discharge, Environmental Politics, DOI: [10.1080/09644016.2026.2627171](https://doi.org/10.1080/09644016.2026.2627171)


To link to this article: <https://doi.org/10.1080/09644016.2026.2627171>

 View supplementary material 

 Published online: 16 Feb 2026.

 Submit your article to this journal 



 Article views: 121

 View related articles 

 View Crossmark data 



# Geopolitical currents and contested science: Chinese media framing and politicization of the Fukushima nuclear wastewater discharge

Liqian Wu  and Xiaoxiao Cheng 

College of Media and International Culture, Zhejiang University, Hangzhou, China

## ABSTRACT

This study investigates how Chinese media politicize the Fukushima nuclear wastewater discharge by integrating computational analysis with qualitative interpretation across 14,126 news articles (2021–2023). Focusing on frames, discursive strategies, and actor configurations, the analysis shows that highly politicized frames – emphasizing responsibility attribution, diplomatic confrontation, and international conflict – dominate news coverage. Discursively, reports transform scientific uncertainty into political symbolism, using credibility disputes, procedural doubts, and selective emphasis on long-term risks to legitimize predetermined geopolitical positions. Actor networks further reveal a structural reliance on political elites while marginalizing scientific expertise. These patterns reflect China’s hierarchical media system, whose top-down information flows homogenize narratives and channel scientific ambiguity toward unified ideological reinforcement. The findings demonstrate how politicization operates under a non-competitive party system, showing that scientific uncertainty becomes a strategic resource shaped by structural media constraints.


**ARTICLE HISTORY** Received 8 May 2025; Accepted 1 February 2026


**KEYWORDS** Nuclear issue; Fukushima; politicization of science; scientific uncertainty; mixed-methods

## Introduction

The 2011 Fukushima Nuclear Accident continues to spark global debate, intensified by Japan’s decision on 24 August 2023, to discharge treated nuclear wastewater into the Pacific Ocean. Unlike the inadvertent 2011 leak, this intentional release directly linked technical assessments to broader questions of political responsibility and international trust.

Despite years of the Advanced Liquid Processing System (ALPS) development by Tokyo Electric Power Company (TEPCO) and a two-year safety review by the International Atomic Energy Agency (IAEA) affirming

**CONTACT** Xiaoxiao Cheng  [xxcheng21@zju.edu.cn](mailto:xxcheng21@zju.edu.cn)

 Supplemental data for this article can be accessed online at <https://doi.org/10.1080/09644016.2026.2627171>.

© 2026 Informa UK Limited, trading as Taylor & Francis Group

compliance with international standards, the discharge triggered strong opposition from China, Russia, South Korea, and Pacific Island nations, revealing geopolitical divisions. The controversy exemplifies a fundamental tension, i.e. scientific and environmental assessments confront political narratives shaped by sovereignty concerns, historical grievances, and regional rivalries. Persistent uncertainties about long-term marine ecological impacts exacerbate this science – politics divide, particularly as intricate nuclear knowledge is conveyed to the public through media interpretations aligned with national interests. This raises a crucial question: when nuclear risks are discussed, do public debates reflect scientific evidence or political agendas?

This dilemma echoes Beck's (2009) argument that the inherent complexity of advanced scientific issues erodes science's 'monopoly' on rationality, leading to competing claims among various stakeholders and a fragmentation of public discourse. Nuclear technology epitomizes such modern risks, with the Fukushima discharge serving as a stark confluence of scientific expertise, international relations, and environmental ethics – particularly resonant in the context of Sino-Japanese relations.

Media play a decisive role in shaping how distant events become meaningful to domestic audiences (Cottle 2009, Pantti *et al.* 2012). In covering controversial scientific issues, media inevitably reflect competing stakeholders' interests, shaping both their political character and news value. Simultaneously, through 'news domestication,' international events are reinterpreted within local political and historical contexts (Chan 2002), forging connections between global crises and domestic priorities while reinforcing national identities and dominant ideologies (Hallin and Gitlin 1993).

Against this backdrop, the Fukushima wastewater case offers a critical lens for examining the politicization of scientific controversies. Using mixed methods, this study investigates how Chinese media frame and narrate the discharge incident, revealing the entanglement between scientific claims and political imperatives.

## Literature review

### *Politicization of science and scientific uncertainty*

Science and technology are embedded in social structures and never operate in isolation. The production of scientific knowledge is inherently a social and political practice (Scheufele 2014), shaped by political – economic resources and social relations network. The blurred boundaries between modern science, democratic politics, and the public sphere make neutrality difficult to sustain (Post and Ramirez 2018). When scientific issues intersect with contested issues of power, morality, or identity – and collective decisions

must be made through democratic processes (Hay 2007, pp. 65–70) – they naturally become arenas of political action (Brown 2014). ‘Politicization’ describes this shift, whereby originally nonpolitical issues enter political arenas (Zürn 2019). Once scientific knowledge is employed a governing tool to justify policy choices, it is easily drawn into conflicts of power and interest, giving rise to the politicization of science (Weingart 1999).

At the very core of politicization lies the inherent uncertainty of modern science (Bolsen and Druckman 2015). The tension between scientific ‘consensus’ and ‘controversy’ creates fertile ground for political debate (Bolsen and Shapiro 2018). Scientific findings often provide probabilistic evidence that supports competing or even contradictory interpretations (Oreskes and Conway 2010), and future research can revise earlier conclusions. Consensus reflects the academia’s long-term accumulation of mainstream views (e.g. anthropogenic climate change and mandatory childhood vaccination). Controversies may arise from methodological, interpretive, or evidential disputes, or from value conflicts and external interests. Political actors frequently exploit uncertainty to undermine consensus for strategic purposes (Bolsen and Druckman 2015). Thus, scientific uncertainty serves as both a normal feature of science and a discursive resource that enables political actors to transform consensus into controversy.

Politicization is evident in issues such as climate change (Post 2016) and genetic engineering (Maesele *et al.* 2017). While it can, in some contexts, enhance democratic deliberation and clarify public values (Mouffe 2009), it more often results in the selective use of scientific evidence to reinforce preexisting political stances. This can undermine scientific authority, fuel public distrust (Weingart 1999, Pielke 2004, Oreskes and Conway 2010, 2022), and entrench ideological polarization (Marquardt & Lederer, 2022; Palonen *et al.*, 2019; Rekker, 2021). Nuclear energy has long been associated with scientific uncertainty, which is further amplified by the lagging ethical and institutional frameworks (Beck 2009, Scheufele 2013). Against this backdrop, Fukushima discharge has evolved into a highly politicized issue marked by intense stakes and controversy.

Media play an essential role in the politicization of science, not only representing it but actively shape and intensify it. Scientific issues rarely gain attention for their intrinsic principles; rather, they enter public discourse through symbolic struggles within political, economic, and cultural systems (Brossard and Scheufele 2013). Scheufele’s (2014) model of ‘science communication as political communication’ underscores the inevitability of scientific facts being transformed into mediated realities. Consequently, science communication, as a mechanism of public issue construction, is embedded within media systems that are themselves deeply embedded in political power structures. This naturally directs our attention to how media systems provide the structural roots for politicization.

### **Media system and the politicization of science**

Media system shapes the macro-environment in which science becomes politicized (Litvinenko *et al.* 2022). Hallin and Mancini's (2011) notion of 'political parallelism' illustrates how the nature and depth of media – party linkages structure the politicization of public issues. In competitive party systems (Sartori 2005), mostly western societies, scientific topics often fragment along partisan lines, as evidenced by US media polarization on climate change (Chinn *et al.* 2020). Following the Fukushima accident, media coverage in different countries closely aligned with their respective nuclear energy policies and partisan politics (Park *et al.* 2016). For instance, media outlet in Germany and Swiss – countries with more diverse political structures – extensively connected the incident to ongoing domestic anti-nuclear movements; by contrast, countries with fewer political divisions over nuclear energy – such as France and the UK – focused more on the immediate earthquake and tsunami hazards rather than on systemic nuclear risks (Kepplinger and Lemke 2016). These patterns support the assertion that 'the diversity of the political spectrum is likely influenced by the diversity of political parties that greatly define debate within the political system' (Park *et al.* 2016, p. 15).

China, by contrast, operates under a non-competitive party system (Sartori 2005). As part of the state's ideological apparatus, media outlets align science communication with national policy priorities. Reflecting China's market-oriented reforms and the rapid rise of social media, the media landscape can be categorized into four sectors: state-owned media, market-oriented media, We media, and platform media (Yin *et al.* 2024). State-owned media (e.g. Xinhua News Agency), spanning national to municipal levels, form the backbone of the party – state communication system. Market-oriented media (e.g. Nanfang Metropolis Daily) operate commercially under professional licenses but remain under state regulation, exhibiting strong political parallelism. We media encompass individual creators or teams without press credentials, who influence agendas and mobilize publics through personalized commentary. Platform media (e.g. Tencent News) serve as infrastructure-based news aggregators that generate in-house content, despite being licensed limited to 'repost services.' Information flow is subject to state monitoring (Zhang *et al.* 2025), resulting in a top-down dissemination of news – especially in international reporting tied to national identity – with limited room for editorial independence.

In China, scientific issues often intersect with 'scientific nationalism,' linking technological advancement to national strength (Koch 2024; Wang 2002), which positions nuclear topics within narratives of national strategic interests (Dai *et al.* 2014). The Fukushima issue is further shaped by Sino – Japan relations, where historical experiences of Japanese imperialism have

strengthened Chinese national identity through geopolitical trauma, fueling both top-down and bottom-up nationalism. This mobilizes domestic support while generating identity-based international tensions (He 2007, Soehl and Karim 2021), echoing the global rise of conservatism.

Across media systems and cultural contexts, institutional logics drive active intervention in scientific issues. Media organizations structure news narratives and compete for interpretive dominance in public debate, shaping how scientific knowledge enters the public sphere and the political meanings it acquires. Building on this structural foundation, the micro-level processes of news production further construct a politicized mediated reality.

### ***News production: constructing a politicized mediated reality***

Media do more than transmit scientific information; they embed scientific issues within specific news frames (Gamson and Modigliani 1989, Park *et al.* 2016, Du and Han 2020, Tollefson 2020), discursive strategies (Boykoff and Boykoff 2007, Lazic and Kaigo 2013), and actor structures (Chinn *et al.* 2020, Hart *et al.* 2020). Through this process, they transform expert knowledge problems into political public issues (Brossard and Scheufele 2013, Post and Ramirez 2018).

#### ***Frames***

News frames translate complex scientific details into coherent narratives through selection, emphasis, and exclusion (Gitlin 1980), and consequently make problem definition, causal interpretation, moral evaluation, and treatment recommendation (Entman 1993). Because news rarely achieves full objectivity or political neutrality (Tollefson 2020), scientific issues are often framed using conventions from political journalism – such as *Conflict*, *Consequences*, and *Responsibility* (Iyengar 1991, Neuman *et al.* 1992) – alongside *Action/Efficacy* and *Scientific consensus/Scientific controversies* frames (Bolsen and Shapiro 2018). After the Three Mile Island (1979) and Chernobyl (1986) disasters, coverage increasingly emphasized ‘out of control’ and ‘public accountability’ frames (Gamson and Modigliani 1989), shifting focus from technical failure to governance and responsibility. The 2011 Fukushima accident revived debates over nuclear risks and regulation (Lazic and Kaigo 2013); subsequent studies found that news framing focused on economic effects, energy structure, regulatory oversight, and responsibility attribution (Park *et al.* 2016, Du and Han 2020, Tollefson 2020).

#### ***Discourse***

Discourse analysis extends framing analysis by examining semantic detail rather than thematic focus. Politicization often unfolds through metaphors, dichotomies, and other discursive strategies. For example, in Chinese climate

discourse, the term ‘climate change’ frequently carries politicized connotations, whereas ‘global warming’ tends to appear in depoliticized contexts (Li *et al.* 2024). To maximize news value and audience appeal, media rely on dramatization and binary oppositions (Boykoff and Boykoff 2007). Such rhetorical practices embed implicit value judgments, boosting visibility while weakening the rational grounds for scientific debate.

### Actors

Actors encompass both news sources and individuals central to events. Media privilege political authorities as sources (Bennett *et al.* 2008), resulting in politicians and government agencies being cited more often than scientists (Chinn *et al.* 2020). Although news appears to present diverse stakeholders, their visibility reflects structured inequalities in discursive power – a core mechanism of politicization (Cobb and Elder 1971).

Taken together, media drive the politicization of science through a multi-layered mechanism: scientific uncertainty operates within media system constraints, is organized through politicized frames and discursive strategies, and is enacted via imbalanced actor configurations. Consequently, public issue emerge imbue with political meaning/leaning and moral emotion. This theoretical framework informs the analysis of the Fukushima discharge, a case that exemplifies these dynamics in the Chinese context.

### Research questions

In China, media are embedded in a state-led agenda-management system, serving both agenda-setting and ideological reinforcement functions. The Fukushima discharge provides a compelling case for examining how Chinese media integrate political positions and deploy ideological narratives to politicize science.

Scientific disputes center on the complex composition of radioactive nuclides, the effectiveness of treatment, long-term ecological risks from oceanic diffusion, and potential bioaccumulation along the food chain (Lin *et al.* 2021, Qi *et al.* 2022). These uncertainties facilitate risk interpreting, policy justification, or international criticism. While the Japanese government relies on IAEA evaluations to legitimize its decision, opponents seize on ‘long-term unknown risks,’ the irreversibility of the discharge, and deficiencies in international accountability, rapidly transforming scientific debates into political conflicts.

Cross-country studies since 2021 (when Japan announced the discharge plan) reveal that East Asian media frame the issue through their own policy concerns and diplomatic orientations. Japanese coverage draws on IAEA assessments to portray the discharge as a responsible technical solution, while addressing fisheries pressures and local protests to maintain balance

(Gong *et al.* 2024). South Korean and Chinese media express similar concerns about marine environments and international justice, highlighting Japan's lack of transparency in risk communication. For instance, *China Daily* situates the dispute within the 'US – Japan alliance' tensions and cites experts to question the scientific basis, while *The Korea Herald* attributes domestic opposition to historical grievances (Lu 2023, Gong *et al.* 2024). These studies demonstrate the 'social amplification of risk' effect, but have not fully examined how scientific uncertainty becomes a resource for politicized communication.

The discharge spans a long timeline, with formal implementation in 2023 providing a new vantage point. Grounded in the mechanisms through which media drive the politicization of science, this study moves beyond conflict-centered perspective. It investigates how Chinese media, through frames, discourse, and actors, embed scientific controversies within national interests and ideological structures, offering a multidimensional understanding of politicization. The research questions are as follows:

**RQ1:** Across different phases of the Fukushima discharge, how do Chinese media select news frames, and how do these narrative choices reflect the politicization of science?

**RQ2:** What discursive strategies do Chinese media use to construct a politicized mediated reality? How do they manage scientific consensus or controversies and present scientific uncertainty?

**RQ3:** What actor configurations do Chinese media construct, and what roles do these actors play in the politicization process?

## Research design

### *Data collection*

To capture the evolution of media coverage, we sourced articles from the Divominer database (<https://www.divominer.com/en/>), which aggregates daily-crawled news articles from various website sources, including state-owned ( $N = 9399$ ), market-oriented ( $N = 527$ ), we media ( $N = 806$ ) and platform-based media ( $N = 3394$ ). The search spanned 2021 to 2023, using the keywords 'Japan' combined with either 'nuclear wastewater' (核废水) or 'nuclear sewage' (核污水) in titles. This timeframe encompasses the announcement of Japan's discharge plan in 2021, preparatory phases, and the actual implementation in 2023.

The initial article set was refined through keyword frequency filtering and duplicate removal (based on source, title, and content), resulting in a preliminary corpus of 18,765 articles. To enhance focus, we applied a further keyword threshold ( $\geq 4$  occurrences), yielding a final dataset of 14,126 unique news articles – approximately 75% of the initial corpus – thus reducing noise while ensuring representativeness.

### Analytical strategy

This study employs a mixed-methods approach, integrating computational techniques and qualitative discourse analysis to examine the frames, discourse, and actor configurations – as outlined in the theoretical framework – in Chinese media coverage of the Fukushima nuclear wastewater discharge (see Figure 1). We began with topic modeling to identify latent themes, which informed frame construction. Semantic and entity/actor co-occurrence networks were then built to map relationships among key terms and actors. Finally, discourse analysis returned to the original texts to unpack nuanced meanings and contextual implications. This multi-layered approach enables a comprehensive examination of how scientific uncertainty is politicized across the three dimensions.

### Identifying news frames and operationalizing politicization

News frames were operationalized as thematic clusters of co-occurring topics, following established computational grounded theory (Walter and Ophir 2019). The process involved two main steps. First, we applied Latent Dirichlet Allocation (LDA) topic modeling on the preprocessed corpus. A term-frequency matrix was constructed, and LDA models were trained with varying numbers of topics (ranging from 5 to 40). Model selection was guided by perplexity and topic coherence metrics, combined with manual

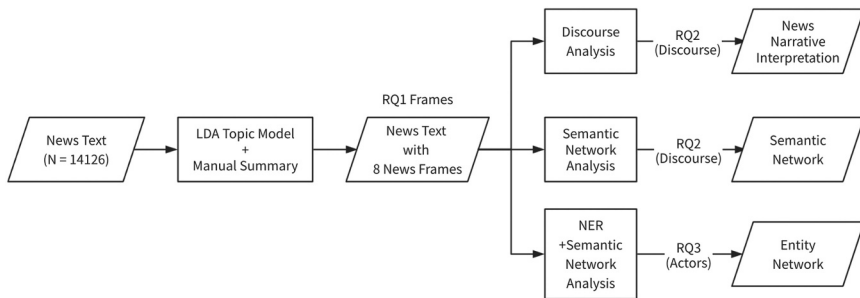


Figure 1. Analytical strategy.

inspection. The 17-topic solution was selected for its clear differentiation and low redundancy.

Second, frames were derived inductively by grouping related LDA topics based on shared narrative elements. Through iterative qualitative review of topic exemplars, we consolidated all the topics into eight overarching frames: *Conflict (CONF)*, *Economic Consequences (ECONC)*, *Environmental Consequences (ENVC)*, *Event Development (ED)*, *Government Action (GA)*, *International Cooperation (INTC)*, *Responsibility (RESP)* and *Scientific Controversies (SC)*. A detailed conceptualization is provided in Table S1 (see Appendix A). To enable temporal analysis, frame salience was quantified by aggregating topic proportions across articles.

To operationalize the degree of politicization, we conducted a systematic qualitative assessment of each frame, drawing on the theoretical literature on politicization (e.g. Weingart 1999, Bolsen and Druckman 2015). This involved carefully reading and coding representative articles within each frame for indicators of politicization, such as the explicit invocation of geopolitical tensions and power dynamics. Frames were then categorized by politicization intensity: highly politicized (explicit political contestation and ideological embedding), moderately politicized (technical themes interpreted through political lenses), and low politicization (primarily factual or impact-oriented reporting). This operationalization bridges quantitative frame detection with qualitative theorization, informing subsequent discourse and actor analyses. Specifically, discourse analysis delves into the rhetorical strategies within varying degree of politicized frames to reveal how scientific uncertainty is discursively mobilized for political ends, while actor analysis maps the configuration of sources and/or actors in these frames to uncover imbalances that reinforce politicized narratives.

### **Constructing semantic and entity networks**

To explore relational structures in discourse and actor representations, we constructed two types of co-occurrence networks at the sentence level, focusing on patterns within the identified frames to further illuminate politicization dynamics. For semantic network, co-occurrences were calculated for sentences containing at least two content words, revealing discursive patterns such as how uncertainty terms link to political attributions. This approach highlights how discourse within politicized frames instrumentalizes scientific ambiguity to construct political meanings.

The entity/actor network employed Named Entity Recognition (NER) techniques via Diffbot's Natural Language API (<https://docs.diffbot.com/reference/introduction-to-natural-language-api>) to extract entities categorized as persons, organizations, and locations. This enabled systematic identification of primary actors, information sources, and geographical areas. Co-

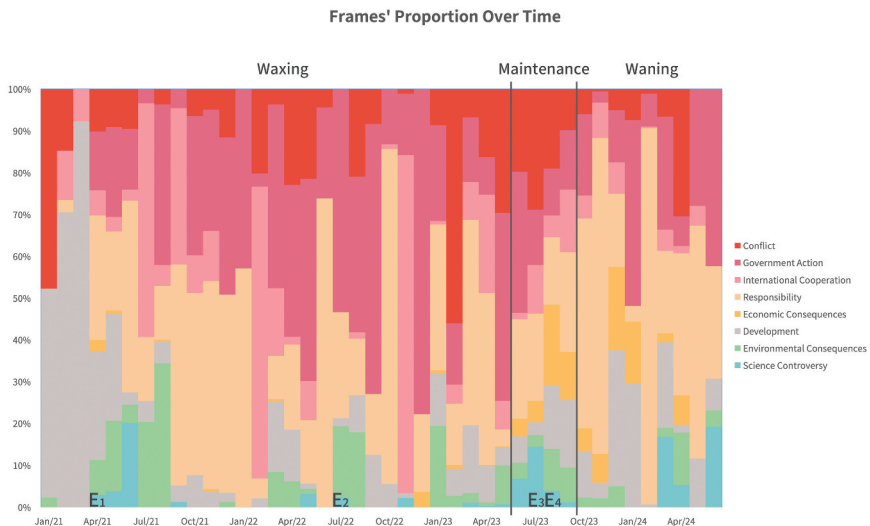
occurrence frequencies and *phi* coefficients were computed for all word and entity pairs, retaining only statistically significant associations ( $p < .01$ ). By mapping actor (eigenvector) centrality and associations, this analysis elucidates how imbalanced source configurations – such as the privileging of state actors over scientists – contribute to the politicization process, complementing the frame-based operationalization.

## Results

### *Frames: dominated by politicized narratives*

Figure 2 exhibits the distribution of news frames across different phases of coverage, revealing significant variations ( $\chi^2 = 1765.4$ ,  $df = 14$ ,  $p < .001$ , see Table S2 in Appendix A).

The salience of these frames and their narrative implications collectively highlight key features of science politicization. We grouped the eight frames by their politicization intensity (see Table 1). Highly politicized frames—*RESP*, *GA*, and *CONF*—explicitly invoke geopolitical contestation, diplomatically charged blame assignment, and state-centered power struggles,



E<sub>1</sub> (2021–04): Japanese government finalized the discharge plan.

E<sub>2</sub> (2022–07): The Japan Atomic Energy Regulatory Commission officially approved the discharge plan.

E<sub>3</sub> (2023–07): TPECO received Assessment Report for Compliance with IAEA Safety Standards.

E<sub>4</sub> (2023–08): The first round of discharge was implemented.

**Figure 2.** Frame proportion over time. Drawing on Downs (1991) issue-attention cycle theory, we divided the coverage timeline into three phases based on key events: (1) waxing phase (Jan 2021–May 2023), characterized by building awareness; (2) maintenance phase (Jun 2023–Sep 2023); (3) waning phase (Oct 2023–Jun 2024).

**Table 1.** Frames grouped by politicization intensity.

Highly politicized (63.6%)	Moderately politicized (9.2%)	Low politicized (27.1%)
<i>RESP</i>	<i>INTC</i>	<i>ED</i>
<i>GA</i>	<i>SC</i>	<i>ENVC</i>
<i>CONF</i>		<i>ECONC</i>

accounting for 63.6% of coverage. Moderately politicized frames—*INTC* and *SC*—interpret technical or procedural themes through international alignment and strategic positioning, comprising 9.2% of the coverage. Low-politicization frames—*ED*, *ENVC*, and *ECONC*—focus on factual reporting or impact assessment with minimal political overlay, making up the remaining 27.1%.

This distribution underscores a pervasive politicized lens throughout the coverage, with highly politicized frames dominated across all phases. Specifically, *RESP* frame (27.4%,  $\chi^2 = 654.4$ ,  $df = 2$ ,  $p < .001$ ) peaked during the waning phase, emphasizing political attribution and moral blame. It manifests in two ways: (1) amplifying the Ministry of Foreign Affairs of China's (MFA) opposition to reinforce national position (e.g. topics R1 and R4); and (2) constructing a credibility crisis for Japanese government, TEPCO, and the IAEA (e.g. R2 and R3). This frame transformed technical disputes into ethical judgments, bridging scientific concerns with geopolitical accountability. *GA* frame (18.9%,  $X^2 = 68.6$ ,  $df = 2$ ,  $p < .001$ ) was prominent in the waxing phase, capturing concrete political responses – particularly from Japan, South Korea, and Taiwan of China – including official positions, policy measures, and political debates. Topics focused on Japanese government policies (G1), South Korean partisan divisions (G2), and political confrontations in Taiwan, China (G3), often weaponizing the issue for ideological purposes. The *CONF* frame (17.3%,  $\chi^2 = 274.6$ ,  $df = 2$ ,  $p < .001$ ), driven by news-value preferences (Iyengar 1991, Neuman *et al.* 1992) for drama, surged during maintenance phase. It emphasizes protests from Japanese fisheries groups (C1), international community concerns (C2), and inconsistencies in IAEA report (C3), framing the discharge as a clash between authority and public/international interests.

Moderately and low-politicized frames complemented these dynamics by extending political meaning into ostensibly technical or impact-oriented reporting. *INTC* (5.2%,  $\chi^2 = 54.8$ ,  $df = 2$ ,  $p < .001$ ) frame extends *GA* by highlighting transnational diplomatic responses to Japan's plan, peaking in the waxing phase. *ED* (13.9%,  $\chi^2 = 97.5$ ,  $df = 2$ ,  $p < .001$ ) offers procedural updates but incorporates geopolitical contestation (E1) and domestic online criticism (E2), linking to *RESP* frame. *ENVC* (7.4%) and *ECONC* (5.8%) frames emphasizes potential ecological risks and fishery disruptions,

heightening the issue's normative stakes without overt political rhetoric. Notably, the *SC* frame (4.0%,  $\chi^2 = 119.2$ ,  $df = 2$ ,  $p < .001$ ), adapted from Bolsen and Shapiro's (2018) 'scientific consensus/controversy' distinction, peaked in the maintenance phase but largely bypassed scientific consensus in favor of controversies. Taken together, these patterns indicate that even low politicized frames can function as sites of discursive politicization – an issue examined in detail in the following discourse analysis.

### **Discourse: translating science into attributions of responsibility**

Building on the frame analysis, this section examines the discursive strategies that converted scientific disputes into politicized narratives of accountability. Three recurrent rhetorical strategies emerged across specific frames, systematically eroding scientific authority and redirecting focus to political and ethical dimensions. Table 2 summarizes the correspondence between these strategies and frames; note that these alignments are illustrative rather than exhaustive, as not every article within a frame employs the exact strategy. Cited news articles are listed in Appendix B.

### **Skepticism of plan executor**

Discourse in the *RESP* and *ED* frames delegitimized Japan and TEPCO by constructing a narrative of chronic incompetence and a sustained credibility crisis. Rather than directly evaluating the ALPS system's scientific performance and efficacy, reports invoke TEPCO's history of equipment failures, leakage incidents, data manipulation, and lax oversight to question ethics and governance, thereby advancing a firm oppositional stance.

A dominant theme involves amplifying China's 'opposition and condemnation' (R1, 15.6%), reproducing spokesperson statements that decry the discharge as 'extremely selfish and irresponsible' (e.g. MFA, 14 March 2023; Global Times, 22 August 2023; Xinhua News Agency, 23 August 2023; Nanfang Metropolis Daily, 23 August 2023) and demanding 'transparency and international monitoring' (MFA, 14 March 2023; Xinhua News Agency, 14 March 2023). These official diplomatic expressions establish China's political legitimacy while intensifying moral confrontation. Semantic

**Table 2.** Correspondence between discursive strategy and frames.

Skepticism of plan executor	Questioning international organizations	Instrumentalizing scientific evidences
<i>RESP</i>	<i>CONF</i>	<i>ENVC</i>
<i>INTC</i>	<i>INTC</i>	<i>ECONC</i>
<i>ED</i>	<i>GA</i>	<i>SC</i>
<i>GA</i>		<i>GA</i>

network analysis confirms this, with keywords such as ‘oppose,’ ‘irresponsible,’ and ‘concern’ forming central nodes (see Figure S1 in Appendix A).

Other *RESP*-related topics (R2, 8.3%; R3, 2.0%) ‘expose’ a ‘dark history’ of accidents and compliance issues, portraying the discharge as a ‘premeditated’ decision ‘cost minimization’ strategy by untrustworthy executors (Xinhua News Agency, 24 August 2023; The Paper, 25 August 2023). In the *INTC* frame, Japan’s diplomatic efforts – such as the 2023 G7 Summit – are interpreted as orchestrated public relations (Xinhua News Agency, 17 April 2023). Reports highlights that a government-backed department, Atomic Energy Damage Compensation Support Institution, holds 50.1% voting control over TEPCO (Xinhua News Agency, 21 April 2021), defining the two entities as a unified interest bloc and reinforcing their fundamental untrustworthiness.

### Questioning international organizations

Coverage questioned the IAEA not by disputing its scientific evidence, but by targeting its procedural independence, repositioning it as an actor entangled in credibility issues. This links *CONF*, *INTC*, and *GA* into a cohesive accountability narrative. In *CONF* (e.g. topic C3, 3.1%), reports cites South Korean critiques (e.g. from *The Hankyoreh*) arguing that IAEA released assessment prematurely, before completing all analytical cycles. Within the *INTC* frame, clashes between South Korea’s Democratic Party (DP) and the IAEA amplify cross-national alignment of critical positions.

Chinese expert Liu Senlin, from the IAEA’s technical workgroup, became a key source shaping the media’s stance. He expressed ‘regret over the IAEA’s premature assessment without adequate consultation,’ blurring the scientific procedures and redirected attention to deficiencies in international consultation mechanisms. As reported:

*Experts of the workgroup discussed government responsibilities and functions . . . the safety of the discharge system, radiological impact assessments . . . public consultation. There were no full consensus was reached. . . Beyond radiological impacts, the issue also involves social, psychological, economic, and marine ecological dimensions, yet Japan’s current assessment addresses only radiological effects and lacks a comprehensive evaluation.* (China News Service, 6 July 2023)

As the discharge approached, the China MFA’s discourse toward the IAEA shifted from urging compliance with international standards in 2021 to asserting that IAEA lacks independence and denying the report’s efficacy in 2023. While the IAEA operates at the science-politics nexus, media discourse downplays its scientific evaluations, reframing assessments as politically contentious artifacts. By emphasizing the IAEA’s supposed failure to fulfill its cooperative responsibilities and citing criticism through multi-

layered arguments, coverage reinforces a politicized rejection of the discharge.

### **Instrumentalizing scientific uncertainty**

Reports instrumentalize scientific uncertainty by leveraging the established fact that Fukushima's accidentally contaminated water differs compositionally from ordinary nuclear wastewater. Coverage rarely details public data, real-time monitoring, or nuclide treatment processes; instead, it emphasizes water compositional complexity, irreversible harm, and monitoring instability, which are perceived as potential long-term risks. Even categorized as low in politicization, *ENVC* and *ECONC* frames also cite the harmful consequences to legitimize political stances.

Framing analysis shows the *SC* frame dominated by controversies rather than consensus, a pattern that is discursively realized through a non-neutral word choice of 'sewage'. Semantic network further proves this rhetorical terminology: 'nuclear sewage' (0.99) vastly outpaces 'nuclear wastewater' (0.15) (see Figure S8 in Appendix A) in the coverage. Media consistently label the 'nuclear sewage' with unguaranteed safety, distinguishing it from ordinary wastewater and asserting, 'whatever label you use, it's nuclear sewage definitely' (People's Daily, 26 May 2021; China News Service, 26 May 2021). This rhetoric negated ALPS capability and fuels doubts about TEPCO's handling capacity and IAEA's assessment quality through claims of 'fundamental difference' and 'unreliable long-term safety' (MFA, 11 July 2023; China Youth Daily, 11 July 2023).

In extreme cases, scientific evaluation is equated with political strategy. For instance, in the *GA* coverage of South Korea, the Yoon Seok-yeol administration's scientific measures – 'on-site investigations to obtain first-hand data' and 'enhanced marine and seafood monitoring' – are ironically portrayed as political theater, serving the authorities' pro-Japan stance (The Paper, 13 July 2023). This dramatized political narrative selectively reshapes the complex issue, further marginalizing scientific evidence, and amplifying the societal impact of scientific uncertainty.

Collectively, these discursive strategies embed scientific issue within geopolitical narratives, enhancing politicization by subordinating evidence to predetermined positions.

### **Actor configurations: geopolitically driven power struggles**

Entity co-occurrence networks reveal actor configurations that privilege political elites over scientific voices, translating the event into a quasi-judicial of multi-party protest.

### The absence of scientists

Scientific actors are strikingly underrepresented, with no natural scientists or institutions ranking in the top 100 by centrality across the corpus. Even in SC (Figure 3), science-related entities constitute the lowest proportion (13.3%). Textual evidence reveals that most quoted ‘experts’ are drawn from international politics, law, or other social science fields (e.g. Oshima Kenichi, Professor at Ryukoku University’s Faculty of Policy Research; Zhou Yongsheng, Professor at the Institute of International Relations of China Foreign Affairs University). Moreover, narratives of scientific controversies remain dominated by state agencies and political figures such as ‘Foreign Ministry (China & Japan)’ and ‘Yasutoshi Nishimura’ (Japan’s Minister of Economy, Trade, and Industry), tailoring scientific evidence to national interest and positional claims.

A rare exception appears in specialized outlets such as *Science & Technology Daily*, which interviewed nuclear scientists before dominant discourses solidified. For example, when a minor leak occurred at the Fukushima nuclear power plant in 2021, Yan Minhao of Southwest University of Science and Technology provided a detailed analysis of

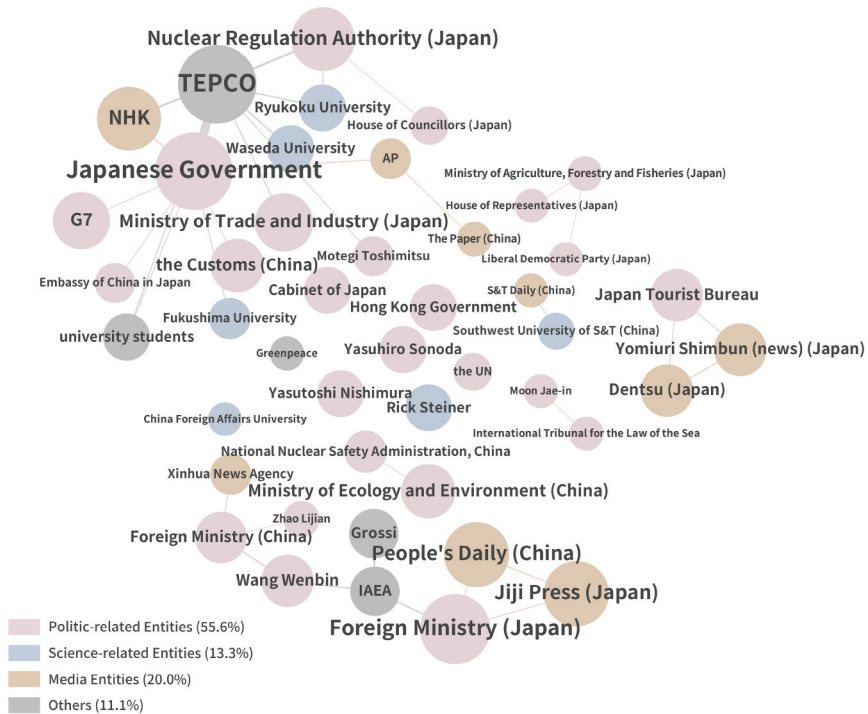


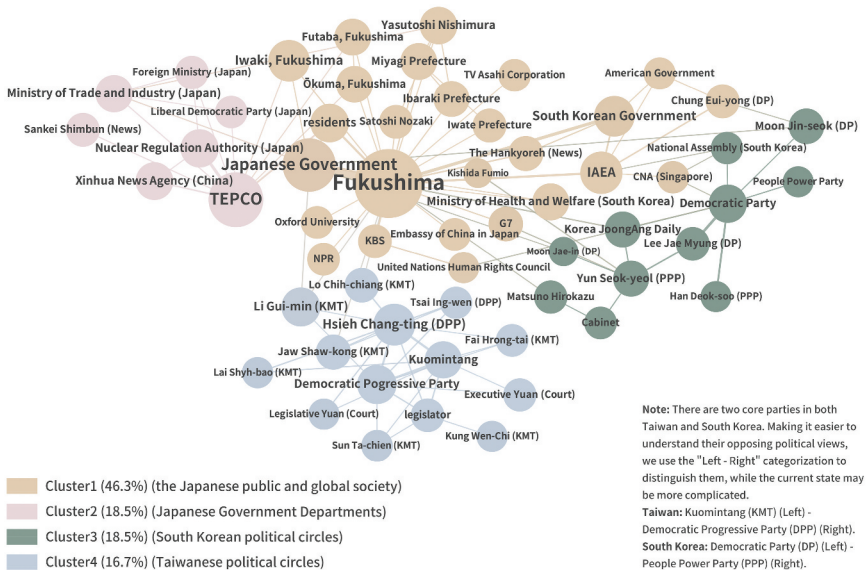
Figure 3. Entity network of *Scientific Controversy (SC)* frame.

discharge standards, technical challenges, and five treatment methods. He pointed out the need to ‘select treatment methods according to specific characteristics of nuclear wastewater’ and noted that ‘the complete separation of radionuclides remains one of the major global scientific challenges,’ thereby underscoring ALPS’s long-term and continuous responsibilities (Science & Technology Daily, 3 June 2021). Such reports used ‘nuclear wastewater’ terminology, illustrating how discursive shifts politicize science over time.

### ***Amplifying regional political struggles***

The GA frame (18.9%) exposes regional political tensions through four entity clusters: Japanese public and global society, Japanese government, South Korean politics, and politics in Taiwan of China (Figure 4, aligning with LDA topics G1-G3).

Geographical proximity amplifies coverage of South Korea and Taiwan, China disputes. In South Korea, the 2022 political transition from Moon Jae-in’s Democratic Party (DP) (0.06) to Yoon Seok-yeol’s People Power Party (PPP) (0.20) tracks the issue’s evolution. Waxing phase coverage highlights strong opposition from Moon’s administration, particularly Foreign Minister Chung Eui-yong (DP) (0.15). During the maintenance phase, news focus shifted to intra-Korean political divisions, contrasting the ruling PPP (0.07), perceived as more



**Figure 4.** Entity network of *Government Action (GA)* frame.

conciliatory, with the DP (0.25) led by Lee Jae-myung (0.14). These narratives parallel prior findings on the ‘US-Japan alliance’ frame (Gong *et al.* 2024), as Yoon’s administration was repeatedly described – citing ‘anonymous South Korean government insiders’ (Beijing News, 29 August 2023) – as strengthening its alignment with the emerging ‘US-Japan – South Korea alliance.’

In Taiwan, China, the Democratic Progressive Party (DPP) (0.28), led by Tsai Ing-wen (0.10), faces criticism from the Kuomintang (KMT) (0.23). The ambiguous stance of Hsieh Chang-ting (DPP) (0.34), Taiwan region’s representative to Japan, who made controversial statements on social media was fiercely criticized by KMT legislators. They claimed the DPP’s stance towards Japan contradicted its traditional ‘anti-nuclear’ position and expressed concerns about fishery and food safety.

Comparative analysis of the two regional actor clusters shows consistent favoritism toward left-leaning political actors aligned with Chinese positions, critiquing the ‘compromising’ right-wing incumbents. In Taiwan, China, KMT is often regarded relatively pro-Mainland China; it maintains a ‘One China’ consensus on nationalism issues and adopts a more cautious stance toward the political actions of the Japanese government. By contrast, the right-leaning DPP authorities were portrayed as holding a ‘pro-Japan stance’ (Guancha Syndicate, 24 August 2023), and were the target of criticism from seven KMT actors identified in the entity network. A parallel pattern appears in South Korea: the DP (left-leaning) received greater visibility and support, while it accused the right-leaning PPP of staging political theater, such as encouraging seafood consumption, to pacify the public, arguing that such tactics did little to improve its minority position in the National Assembly (Tencent News, 29 August 2023).

Taken together, attitudes toward the discharge aligned with the ideological cleavages between the left and right. What the news ultimately presented was a landscape of geopolitical power struggles, in which Chinese media maintains a consistently unified orientation.

### **Protest shared by global actors**

Low- and moderately politicized frames construct a layered protest narrative isolating Japan. The *RESP*, *CONF*, *ED*, and *INTC* frames build a multi-level opposition involving Japanese domestic actors and international communities, portraying Japanese authorities as an isolated decision-maker that disregards public will.

First, news coverage magnifies the voices of opposition parties in Japan and neighboring countries. In the *RESP* frame (see Figure 5), Japan’s Constitutional Democratic Party and South Korea’s Democratic Party are widely cited, forming a transnational coalition of criticism.

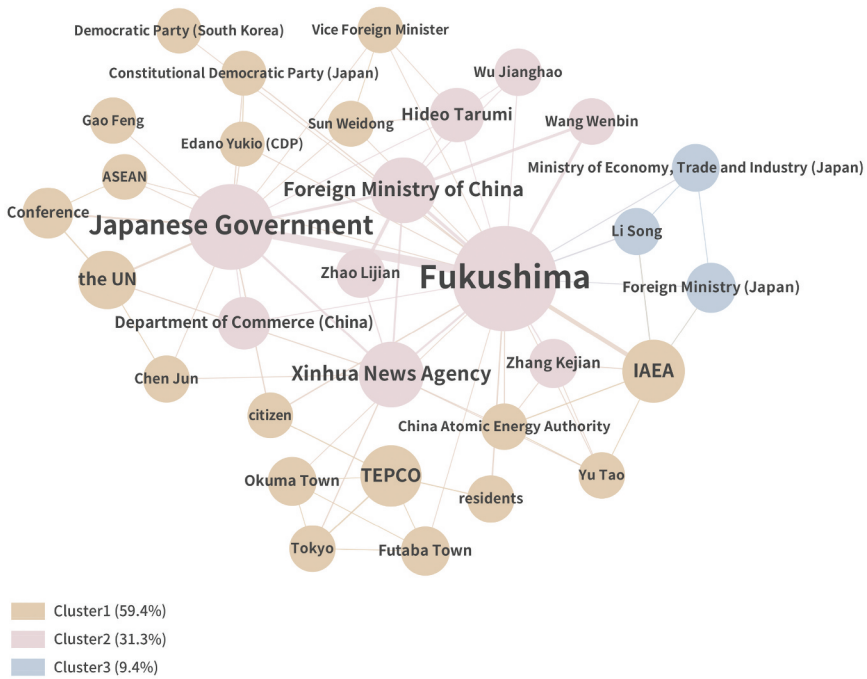
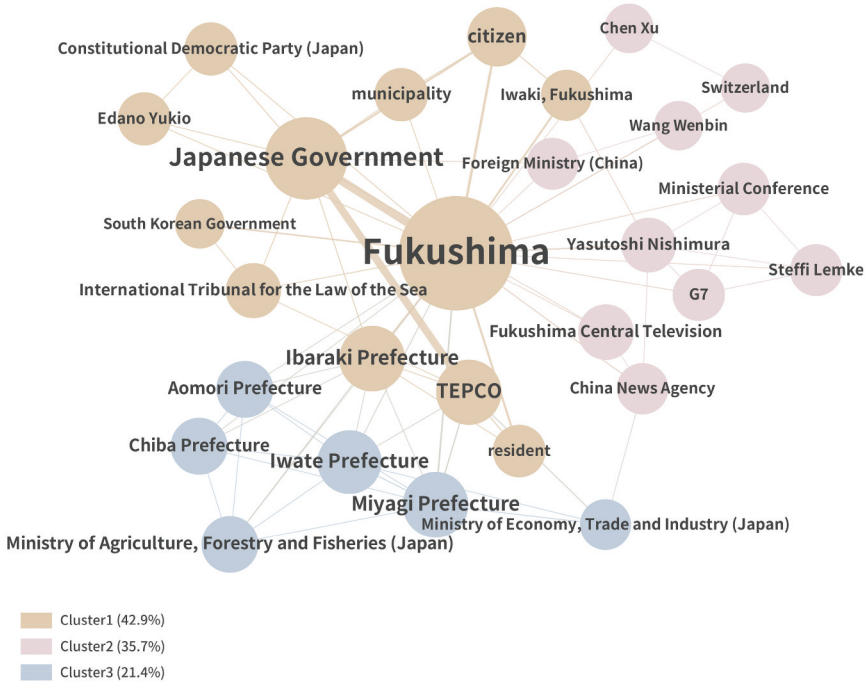


Figure 5. Entity network of *Responsibility (RESP)* frame.

Second, the *CONF* frame escalates of international disputes (see Figure 6). It underscores tensions between Japanese local communities (Ibaraki Prefecture, Aomori Prefecture, Miyagi Prefecture, citizen, resident) and the government over fisheries interests and the accountability of local authorities. Actors such as the South Korean Government and the International Tribunal for the Law of the Sea are also incorporated, depicting a landscape of public contestation and international negotiation.

The *INTC* frame (Figure 7), despite its name, foregrounds contentious voices global forums. For example, South Korea's DP accused the IAEA procedures at its 2021 annual meeting; Germany's Environment Minister Steffi Lemke openly criticized Yasutoshi Nishimura at the 2023 G7 Climate and Energy Ministers' Meeting, preventing Japan from inserting 'welcoming the Fukushima Discharge' into the joint statement (Haiwainet, 17 April 2023).

The United States stands out as an outlier, positioned as Japan's ally in *ED* (Figure 8). Figures like Joe Biden, Antony Blinken, and Special Presidential Envoy for Climate John Kerry appear as supporters of Japan, forming an 'ally' position that contrasts with broader international opposition. For instance, referencing the US foreign policy ordering 'alliance cooperation' above 'climate issues,' reports argue that US support reflects geopolitical



**Figure 6.** Entity network of *Conflict (CONF)* frame.

motivations (CCTV News, 14 April 2021). Coverage also interprets the US – Japan summit as Yoshihide Suga’s attempt to ‘cling to a powerful patron’ (East Day, 15 April 2021). This comparative strategy supplies rhetorical ammunition for criticizing the Japan – US alliance.

Ultimately, the moral condemnation articulated by the China MFA’s integrates these diverse voices. A widely circulated statement enumerates international protests: ‘Protests have taken place in Tokyo, Fukushima, and other regions . . . Beyond China, South Korea, Russia, and the European Union, 311 environmental groups have expressed firm opposition. . . . The US’s approval does not equate to approval by the international society.’ (CCTV News, 14 April 2021). This consolidates a multilevel, multi-actor protest narrative. It not only reframes the discharge as an object of global political rejection and moral judgment, but also extends the discourse from a credibility crisis in the executor to broader appeals for international responsibility.

## Discussion and conclusions

This study employs a mixed-methods approach to examine the politicalization of the Fukushima Discharge in Chinese media coverage, focusing on

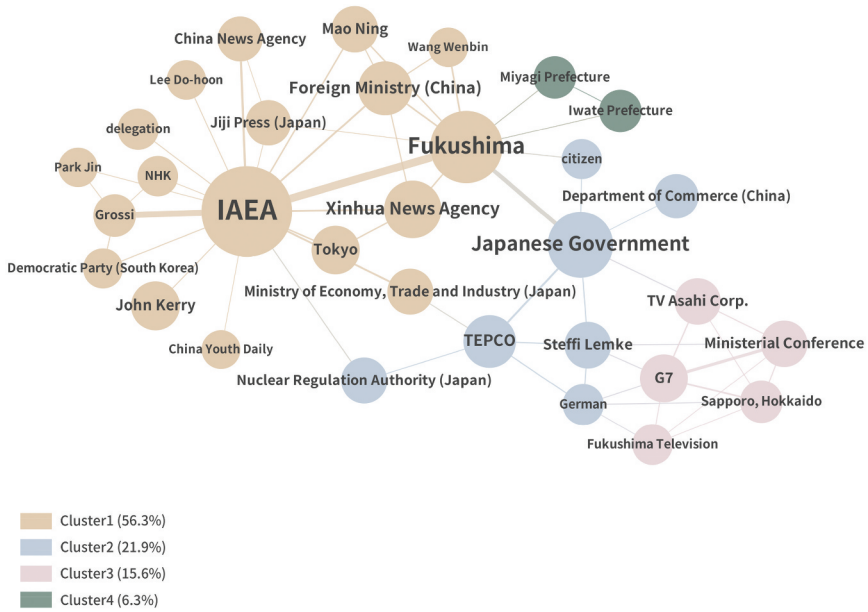


Figure 7. Entity network of *International Cooperation (INTC)* frame.

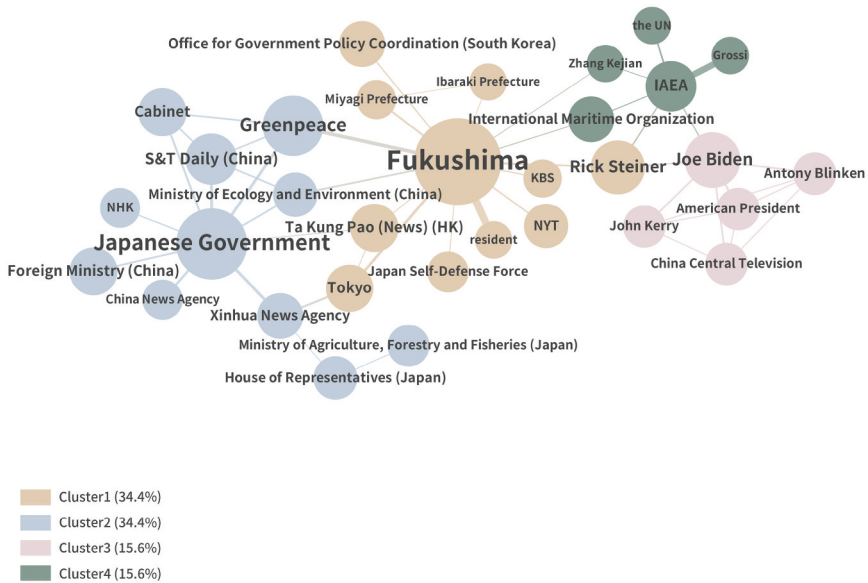


Figure 8. Entity network of *Event Development (ED)* frame.

three dimensions: news frames, discursive strategies, and actor configurations. Grounded in the theoretical framework that positions scientific uncertainty as a core driver of politicization – operating within the constraints of media system and manifesting through politicized frames, discourses, and actor configurations – the analysis reveals a cohesive process where scientific controversies are systematically translated into geopolitical narratives.

The findings demonstrate that highly politicized frames, including *RESP*, *GA*, and *CONF*, dominated the coverage, foregrounding state-centered blame attribution, diplomatic responses, and international tensions. These frames intertwined with discursive strategies that delegitimized Japan and TEPCO through skepticism of their competence, questioned the IAEA's procedural independence, and instrumentalized scientific uncertainty to amplify long-term risks and ethical concerns. In this manner, scientific facts are recast as political symbols (Scheufele 2014), with scientific uncertainty serving as rhetorical tools and discursive resources for articulating and advancing predetermined political positions (Weingart 1999, Bolsen and Druckman 2015).

Actor configurations further reinforce these patterns, highlighting the media's structural preference for political elites and its systematic marginalization of scientific sources (Bennett *et al.* 2008, Chinn *et al.* 2020). The privileging of state actors and the selective amplification of oppositional figures – such as left-leaning politicians in South Korea and Taiwan of China – create a hierarchical narrative that aligns with China's national interests. This contrasts sharply with actor configurations in multiparty democracies, where diverse stakeholders, including scientists, NGOs, and political opposition actors often compete for discursive dominance. In the Chinese context, such configurations underscore a state-led coordination of politicization, channeling scientific ambiguity into unified ideological reinforcement rather than pluralistic contestation and debate.

Taken together, these elements illustrate a multi-layered mechanism of the politicization of science: frames provide the overarching narrative structure, discourses embed scientific ambiguity and controversy within moral and political valuations, and imbalanced actor selections and configurations prioritize geopolitical alignment over expert consensus. In the Fukushima case, scientific uncertainties – stemming from debates over ALPS efficacy, oceanic diffusion, and bioaccumulation – serves not as a neutral epistemic challenge but as a discursive resource to justify predetermined positions. This process echoes Beck's (2009) notion of modern risks/uncertainties eroding science's monopoly on rationality, particularly when intertwined with power dynamics in non-competitive party systems.

Theoretically, China's experience extends those general mechanisms of science politicization, which are predominantly derived from democratic but fragmented societies (Mancini 2013). What distinguishes the Chinese case is

not the existence of such mechanisms per se, but their highly centralized and unidirectional articulation within non-competitive party system constraints. In competitive party systems, scientific uncertainty often fuels partisan contestation and pluralistic framings that balance consensus with ideological debates (e.g. Stocking and Holstein 2009, Park *et al.* 2016). By contrast, Chinese media exhibit a unidirectional alignment with state priorities driven by top-down information flows from state-owned or official outlets like the MFA's official channels and Xinhua News Agency. Market-oriented and platform media supplement this narrative while adhering to core positions, and we media reproduce upstream content without independent sourcing. This centralized structure not only directs information flow but also homogenizes coverage, emphasizing national stances, geopolitical conflicts, and international moral claims, while to some extent compressing space for nuanced scientific discourse.

Although overt nationalist rhetoric is absent, subtle expressions emerge through highlighting of actors whose positions align with China, such as Japanese domestic protesters and global opponents. This discursive pattern fosters out-group hostility and in-group favoritism (Chen *et al.* 2022), generating an expression that blends geopolitics, national interests, and national identity, thereby contributing to the reproduction of nationalism ideology, further feeding public distrust in institutions and scientific evidence (Gauchat 2012, Schertzer and Woods 2025). Further research may unpack the interactions among media frames and public or individual attitudes.

The communication of socio-scientific issues is shaped by multiple structural forces, resulting in an ambiguous autonomy (Polanyi 1945, Weingart 1999). Scientific uncertainty and the media system jointly structure the politicalization trajectory of the Fukushima discharge: scientific uncertainty provides the raw material for political argumentation, while the media system supplies the direction and the predetermined stance. Ultimately, news production internalizes politicalized editorial norms, accomplishing the politicalization of science through frame selection, discursive strategies, and actor configuration. In the post-truth culture, the conventional logic of deriving conclusions from facts is often reversed; established conclusions instead dominate the interpretation of evidence, allowing rhetorical contestation to overshadow factual substance. When reporting complex scientific issues, journalists' roles shift to those of curator, convener, public intellectual and civic educator (Fahy and Nisbet 2011), while facing a universal dilemma: the growing complexity of modern science limits opportunities for effective popularization and tends to produce fragmented, isolated information (Burnham 1987). Within a unified political stance and an official-source-dependent media system, using fragmented scientific information to support predetermined conclusions becomes a pragmatic and safe journalistic practice. This case therefore offers theoretical insight

into how politicalization operates in media systems with high editorial centralization, extending existing models – mostly based on Western societies – to a non-competitive party system.

This study has several limitations that warrant consideration. First, the operationalization of ‘politicalization,’ while theoretically grounded, relies on qualitative assessments that could benefit from more granular indicators for finer-grained analysis. Future work might develop quantitative metrics to facilitate direct comparison between Chinese and Western media systems. Second, the NER model exhibits weakness in identifying scientists’ names, which may have underrepresented scientific presence and inflated perceptions of politicization. Finally, using ‘Japan’ rather than ‘Fukushima’ as a keyword in data collection risks omitting relevant articles focused solely on the incident. Addressing these through expanded datasets, refined NER tools, and targeted sampling would enhance robustness and clarify whether the observed mechanisms are unique to China’s context or more universally applicable.

## Disclosure statement

No potential conflict of interest was reported by the author(s).

## Funding

This work was supported by the National Social Science Fund of China [23CXW034], Zhejiang Provincial Natural Science Foundation [LQN25G030005]; and the Key Project of the National Social Science Fund of China [21AZD143].

## ORCID

Liqian Wu  <http://orcid.org/0009-0009-2082-2304>

Xiaoxiao Cheng  <http://orcid.org/0000-0002-0354-6928>

## References

- Beck, U., 2009. *Risk society: towards a new modernity*. Sage Publications Ltd.
- Bennett, W.L., Lawrence, R.G., and Livingston, S., 2008. *When the press fails: political power and the news media from Iraq to Katrina*. University of Chicago Press.
- Bolsen, T. and Druckman, J.N., 2015. Counteracting the politicization of science. *Journal of Communication*, 65 (5), 745–769. doi:10.1111/jcom.12171
- Bolsen, T. and Shapiro, M.A., 2018. The US news media, polarization on climate change, and pathways to effective communication. *Environmental Communication*, 12 (2), 149–163. doi:10.1080/17524032.2017.1397039.
- Boykoff, M.T. and Boykoff, J.M., 2007. Climate change and journalistic norms: a case-study of US mass-media coverage. *Geoforum*, 38 (6), 1190–1204. doi:10.1016/j.geoforum.2007.01.008

- Brossard, D. and Scheufele, D.A., 2013. Science, new media, and the public. *Science*, 339 (6115), 40–41. doi:10.1126/science.1232329
- Brown, M.B., 2014. Politicizing science: conceptions of politics in science and technology studies. *Social Studies of Science*, 45 (1), 3–30. doi:10.1177/0306312714556694
- Burnham, J., 1987. *How superstition won and science lost: popularizing science and health in the United States*. Rutgers University Press.
- Chan, A., 2002. From propaganda to hegemony: Jiaodian Fangtan and China's media policy. *Journal of Contemporary China*, 11 (30), 35–51. doi:10.1080/10670560120091138
- Chen, A., et al., 2022. When national identity meets conspiracies: The contagion of national identity language in public engagement and discourse about COVID-19 conspiracy theories. *Journal of Computer-Mediated Communication*, 28 (1), zmac034. doi:10.1093/jcmc/zmac034
- Chinn, S., Hart, P.S., and Soroka, S., 2020. Politicization and polarization in climate change news content, 1985–2017. *Science Communication*, 42 (1), 112–129. doi:10.1177/1075547019900290
- Cobb, R.W. and Elder, C.D., 1971. The politics of agenda-building: an alternative perspective for modern democratic theory. *The Journal of Politics*, 33 (4), 892–915. doi:10.2307/2128415
- Cottle, S., 2009. *Global crisis reporting*. McGraw-Hill Companies.
- Dai, J., Zeng, F., and Wang, Y., 2014. The overlap of official and popular discourses: the party newspaper's multimedia convergence on the nuclear power issue [官方与民间话语的交叠: 党报核电议题报道的多媒体融合]. *Chinese Journal of Journalism & Communication*, 36 (5), 104–119 doi:10.13495/j.cnki.cjcc.2014.05.008.
- Downs, A., 1991. Up and down with ecology: the “issue-attention cycle”. Proress D. McCombs M.E. eds. In: *Agenda setting*. Routledge. 27–33. doi:10.4324/9781315538389
- Du, Q. and Han, Z., 2020. The framing of nuclear energy in Chinese media discourse: a comparison between national and local newspapers. *Journal of Cleaner Production*, 245, 118695. doi:10.1016/j.jclepro.2019.118695
- Entman, R.M., 1993. Framing: toward clarification of a fractured paradigm. *Journal of Communication*, 43 (4), 51–58. doi:10.1111/j.1460-2466.1993.tb01304.x
- Fahy, D. and Nisbet, M.C., 2011. The science journalist online: shifting roles and emerging practices. *Sage Journals*, 12 (7), 778–793. doi:10.1177/1464884911412697
- Gamson, W.A. and Modigliani, A., 1989. Media discourse and public opinion on nuclear power: a constructionist approach. *American Journal of Sociology*, 95 (1), 1–37. doi:10.1086/229213
- Gauchat, G., 2012. Politicization of science in the public sphere: a study of public trust in the United States, 1974 to 2010. *American Sociological Review*, 77 (2), 167–187. doi:10.1177/0003122412438225
- Gitlin, T., 1980. *The whole world is watching: mass media in the making & unmaking of the new left*. Berkeley: University of California Press.
- Gong, J., et al., 2024. English-language news representations of the Fukushima nuclear-treated-water discharge at the initial phase in Japan and neighbouring countries. *Journal of Risk Research*, 27 (7), 1–13. doi:10.1080/13669877.2024.2387357

- Hallin, D.C. and Gitlin, T., 1993. Agon and ritual: the Gulf War as popular culture and as television drama. *Political Communication*, 10 (4), 411–424. doi:10.1080/10584609.1993.9963002
- Hallin, D.C. and Mancini, P., Eds., 2011. *Comparing media systems beyond the western world*. Cambridge University Press.
- Hart, P.S., Chinn, S., and Soroka, S., 2020. Politicization and polarization in COVID-19 news coverage. *Science Communication*, 42 (5), 679–697. doi:10.1177/1075547020950735
- Hay, C., 2007. *Why we hate politics*. Polity Press.
- He, Y., 2007. History, Chinese nationalism and the emerging sino–Japanese conflict. *Journal of Contemporary China*, 16 (50), 1–24. doi:10.1080/10670560601026710
- Iyengar, S., 1991. *Is anyone responsible? How television frames political issues*. University of Chicago Press. pp. viii, 195.
- Kepplinger, H.M. and Lemke, R., 2016. Instrumentalizing Fukushima: comparing media coverage of Fukushima in Germany, France, the United Kingdom, and Switzerland. *Political Communication*, 33 (3), 351–373. doi:10.1080/10584609.2015.1022240
- Koch, N., 2024. Scientific nationalism and museums of the future in Germany and the UAE. *Political Geography*, 113, 103144. doi:10.1016/j.polgeo.2024.103144
- Lazic, D. and Kaigo, M., 2013. Us press coverage of the Fukushima nuclear power plant accident: frames, sources and news domestication. *Media Asia*, 40 (3), 260–273. doi:10.1080/01296612.2013.11689975
- Li, Y., Yu, B., and Dai, J., 2024. “Climate change” or “global warming”? The (un) politicization of climate in Chinese social media platform. *Environmental Communication*, 18 (7), 927–944. doi:10.1080/17524032.2024.2327069
- Lin, W., et al., 2021. Consequences of marine ecological environment and our preparedness for Fukushima radioactive waste water discharge into the ocean. *Chinese Science Bulletin*, 66 (35), 4500–4509. doi:10.1360/TB-2021-0743
- Litvinenko, A., Borissova, A., and Smoliarova, A., 2022. Politicization of science journalism: how Russian journalists covered the COVID-19 pandemic. *Journalism Studies*, 23 (5–6), 687–702. doi:10.1080/1461670X.2021.2017791
- Lu, Z., 2023. Discourse analysis of “Fukushima nuclear-contaminated water” news reports from the perspective of attitude in appraisal theory. *International Journal of Linguistics, Literature and Translation*, 6 (8), 174–182. doi:10.32996/ijllt.2023.6.8.16
- Maesele, P., et al., 2017. In Flanders fields: de/politicization and democratic debate on a GM potato field trial controversy in news media. *Environmental Communication*, 11 (2), 166–183. doi:10.1080/17524032.2015.1094102
- Mancini, P., 2013. Media fragmentation, party system, and democracy. *The International Journal of Press/Politics*, 18 (1), 43–60. doi:10.1177/1940161212458200
- Marquardt, J. and Lederer, M., 2022. Politicizing climate change in times of populism: an introduction. *Environmental Politics*, 31 (5), 735–754. doi:10.1080/09644016.2022.2083478.
- Mouffe, C., 2009. Democratic politics and the dynamics of passions. Pulkkinen T. ed. In: *The Ashgate research companion to the politics of democratization in Europe*. Routledge. 89–100. doi:10.4324/9781315613635.
- Neuman, W.R., Just, M.R., and Crigler, A.N., 1992. *Common knowledge: news and the construction of political meaning*. University of Chicago Press.

- Oreskes, N. and Conway, E.M., 2010. *Merchants of doubt: how a handful of scientists obscured the truth on issues from tobacco smoke to global warming*. Bloomsbury Publishing.
- Oreskes, N. and Conway, E.M., 2022. From anti-government to anti-science: why conservatives have turned against science. *Daedalus*, 151 (4), 98–123. doi:10.1162/daed\_a\_01946
- Palonen, K., et al., V., & Liste, P., 2019. Rethinking politicisation. *Contemporary Political Theory*, 18 (2), 248–281. doi:10.1057/s41296-019-00326-y.
- Pantti, M., Wahl-Jorgensen, K., and Cottle, S., 2012. *Disasters and the media*. University of Tasmania.
- Park, D.J., Wang, W., and Pinto, J., 2016. Beyond disaster and risk: post-Fukushima nuclear news in U.S. and German press. *Communication, Culture and Critique*, 9 (3), 417–437. doi:10.1111/cccr.12119
- Pielke, R.A., 2004. When scientists politicize science: making sense of controversy over The Skeptical Environmentalist. *Environmental Science & Policy*, 7 (5), 405–417 doi:10.1016/j.envsci.2004.06.004.
- Polanyi, M., 1945. The autonomy of science. *The Scientific Monthly*, 60 (2), 141–150.
- Post, S., 2016. Communicating science in public controversies: strategic considerations of the German climate scientists. *Public Understanding of Science*, 25 (1), 61–70. doi:10.1177/0963662514521542
- Post, S. and Ramirez, N., 2018. Politicized science communication: predicting scientists' acceptance of overstatements by their knowledge certainty, media perceptions, and presumed media effects. *Journalism & Mass Communication Quarterly*, 95 (4), 1150–1170. doi:10.1177/1077699018769668
- Qi, Y., You, K., and Guo, S., 2022. The battle for public opinion of “Japan’s nuclear wastewater sea discharge. *Open Journal of Political Science*, 12 (3), 363–372. doi:10.4236/ojps.2022.123021
- Rekker, R., 2021. The nature and origins of political polarization over science. *Public Understanding of Science*, 30 (4), 352–368. doi:10.1177/0963662521989193.
- Sartori, G., 2005. *Parties and party systems: a framework for analysis*. ECPR Press.
- Schertzer, R. and Woods, E.T., 2025. How nationalist rhetoric drives polarization over climate change in the US. *Environmental Politics*, 1–25. doi:10.1080/09644016.2025.2525638
- Scheufele, D.A., 2013. Communicating science in social settings. *Proceedings of the National Academy of Sciences*, 110 (supplement\_3), 14040–14047. doi:10.1073/pnas.1213275110
- Scheufele, D.A., 2014. Science communication as political communication. *Proceedings of the National Academy of Sciences*, 111 (supplement\_4), 13585–13592. doi:10.1073/pnas.1317516111
- Soehl, T. and Karim, S.M., 2021. How legacies of geopolitical trauma shape popular nationalism today. *American Sociological Review*, 86 (3), 406–429. doi:10.1177/00031224211011981
- Stocking, S.H. and Holstein, L.W., 2009. Manufacturing doubt: Journalists' roles and the construction of ignorance in a scientific controversy. *Public Understanding of Science (Bristol, England)*, 18 (1), 23–42. doi:10.1177/0963662507079373
- Tollefson, J., 2020. Post-Fukushima discourse in the US press: quantified knowledge, the technical object, and a panicked public. *Public Understanding of Science*, 29 (7), 670–687. doi:10.1177/0963662520936186

- Walter, D. and Ophir, Y., 2019. News frame analysis: an inductive mixed-method computational approach. *Communication Methods and Measures*, 13 (4), 248–266. doi:[10.1080/19312458.2019.1639145](https://doi.org/10.1080/19312458.2019.1639145)
- Wang, Z., 2002. Saving China through science: The Science Society of China, scientific nationalism, and civil society in Republican China. *Osiris*, 17, 291–322. doi:[10.1086/649367](https://doi.org/10.1086/649367)
- Weingart, P., 1999. Scientific expertise and political accountability: paradoxes of science in politics. *Science and Public Policy*, 26 (3), 151–161. doi:[10.3152/147154399781782437](https://doi.org/10.3152/147154399781782437)
- Yin, Q., Zheng, S., and Wu, S., 2024. Hidden in plain sight- audience engagement in China's data journalism. *Journalism*, 25 (7), 1559–1577. doi:[10.1177/14648849241248349](https://doi.org/10.1177/14648849241248349)
- Zhang, T.H., Xu, J., and Liu, J., 2025. How do toothless tigers bite? Extra-institutional governance and internet censorship by local governments in China. *The China Quarterly*, 261, 196–215. doi:[10.1017/S0305741024000602](https://doi.org/10.1017/S0305741024000602)
- Zürn, M., 2019. Politicization compared: At national, European, and global levels. *Journal of European Public Policy*, 26 (7), 977–995. doi:[10.1080/13501763.2019.1619188](https://doi.org/10.1080/13501763.2019.1619188)