

## Relational Processes and Networks in Environmental Politics

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**Submitted:** 28 November 2025 **Published:** 18 December 2025

**Issue:** This commentary is part of the issue “The Politics of Environmental Networks” edited by Petr Ocelík (Masaryk University), Monica Di Gregorio (University of Leeds), Carlos Bravo-Laguna (Leiden University), and Eva Fernández G. (University of Geneva), fully open access at <https://doi.org/10.17645/pag.i440>

### Abstract

The inherently relational nature of environmental politics has stimulated the growth of network-oriented research. This concluding commentary emphasizes relationality in environmental political processes as central to understanding multilevel, multi-actor socio-ecological polities. We consider the dual role of networks—both as connecting structures and as prisms of cognitive and symbolic interactions that co-constitute identities and value systems—which shape and govern environmental outcomes. Building on the contributions of this issue, we outline a research agenda that advances network-based inquiry by unpacking the interdependent and dynamic processes linking environmental political networks across diverse entities, subdomains, scales, and contexts, while leveraging recent methodological advancements in network research.

### Keywords

discourse networks; environmental movements; environmental political networks; environmental politics; political opportunities; political process; policy networks; social network analysis

## 1. Introduction

Across the globe, environmental challenges connect diverse—often competing—interests, value systems, forms of knowledge, and unevenly distributed costs. These challenges manifest across multiple scales, from local to global, and include complex “glocal” dynamics linking the two (Gupta et al., 2007). They take varied forms: from the innovative tactics of youth climate strikes, to far-right actors’ mobilization of eco-bordering

discourses to justify anti-migration policies (Turner & Bailey, 2021), to risk-management-oriented adaptation policies designed for populations facing acute climate vulnerabilities (Boin et al., 2021; Thalheimer et al., 2025). In such cases, political, socio-economic, and ecological concerns compound one another. Consequently, efforts to govern environmental challenges—both in terms of means and solutions—are shaped by heterogeneous actors and practices, including discourses and forms of action, which intersect across multiple political arenas and socio-ecological contexts (Barnes et al., 2017).

Moreover, environmental action and policy frameworks have expanded substantially over the past two decades. Considering the case of sustainable food systems—one of the most contested issues in environmental politics (Nagel et al., 2025; Prota, 2022): Community gardens, zero-waste initiatives, and alternative modes of producing, distributing, and consuming food have proliferated alongside democratic and policy innovations such as deliberative fora, the formal recognition of the right to sustainable food access, and the introduction of the new global plastic treaty (Lorenzini, 2022; Newig et al., 2019; Yates et al., 2025). Taken together, these developments highlight a growing emphasis on adaptive innovation within environmental governance. Yet, even when addressed in isolation, such environmental challenges remain entangled with broader intersectoral and transboundary concerns. Health-oriented efforts and sustainable practices addressing climate impacts on agriculture intersect—and at times clash—with prevailing notions of food security, food justice and sovereignty, as well as with climate mitigation objectives (IPCC, 2019; McCarthy et al., 2013). These intricate dynamics, characterized by trade-offs and synergies, show that environmental challenges are embedded in interdependent, multi-level, and multi-actor networks shaped by institutions that reach beyond market forces to include overlapping political and socio-ecological contexts (Barnes et al., 2017; Di Gregorio et al., 2017, 2019; K. R. Schneider et al., 2025).

## 2. Relational Environmental Politics

Building on the abovementioned premises, our approach to environmental politics underscores the inherently relational and political character of environmental problems and solutions. We understand environmental politics as a dynamic and complex system of collaboration, negotiation, contestation, and conflict aimed at addressing socio-ecological dilemmas. Such a system encompasses organizing principles, structures, actors, discourses, values, and forms of action (Alexander, 2014; Leftwich, 2004). Environmental politics can thus be understood as an ongoing set of relational processes guided by shared—though not necessarily consensual—heuristics, including both pro and anti-environmental beliefs, norms, understandings, and strategies. Through these, environmental political practices and arrangements, as well as socio-ecological transformations are continuously (re)produced, contested, and reshaped (Kenney-Lazar et al., 2023; Knoke et al., 2021).

Environmental politics thus emerges simultaneously as both a product and a process of countless political and socio-environmental relational acts, persisting only through their continual re-enactment (Diani, 2022). It is therefore actor-driven and structurally contingent under some degree of relational continuity. This understanding of relationality draws on three key features identified by Dépelteau (2018) and Kenney-Lazar et al. (2023). First, interdependence in social life and society–environment relations manifests through overlapping and intersecting networks that often reveal unequal and exclusionary power relations. Second, actors' interactions with one another and with nature constitute social meaning and shape the technologies of rule that govern these interactions. Third, the co-production of social life and society–environment relations emerges from the interplay between actors and non-agentic entities, including nature. These

relational dynamics shift as social and power configurations are negotiated, contested, transformed or sustained.

Our proposed examination of relationality in environmental politics rests on a dual linkage between environmental political processes and network approaches. First, it entails investigating the environmental political processes through which power relations are continuously (re)configured and situated within and across institutional and extra-institutional arenas and scales of action. This perspective builds upon—but also moves beyond—the classical political process approach in social movement studies (McAdam et al., 2001), as well as the actor-oriented and institutions-oriented policy process approaches (Sabatier, 2007). Second, network approaches can examine the relational dynamics and processes underlying the ongoing constitution of political actors and the shifting configurations of power among them (Abbott, 2007; McAdam et al., 2001).

### 3. Relational Environmental Political Processes

Scholars of the political process tradition have long underscored how the interplay among actors, resources, networks (mobilizing structures and resources), value systems, discourses, narratives (frames and interpretive tools), and the broader political context (political opportunities) shapes the inputs and outcomes of political action (McAdam & Tarrow, 2018; McFarland, 2004). These dimensions have been further explored in environmental discourse network and environmental movement network studies (Diani, 2015; Saunders, 2009). More recently, environmental policy network research has begun to develop the concept of political opportunity within the Advocacy Coalition Framework, advancing explanations of cross-national variation in environmental policy coordination by linking coalition opportunity structures—understood as institutional contexts—to actors' beliefs and strategies, which in turn shape coalition behavior (Ingold et al., 2025; Satoh et al., 2025).

Yet, institutional and extra-institutional perspectives on political processes fall short of their own analytical aspirations—especially in capturing the dynamic, relational character of politics (Tarrow, 2011), as it evolves through interaction and feedback loops among actors and their shared heuristics, all embedded within broader political systems. With notable exceptions, these approaches have also struggled to account for the interdependence and networking practices linking institutional and extra-institutional politics, where mobilization unfolds alongside, in tension with, or in tandem with formal policy-making (Diani & Pilati, 2011).

As such, process-relational perspectives on environmental politics underscore how political life is inherently dynamic and co-constituted through ongoing interactions among diverse actors, practices, and arenas. They highlight how agency, meaning-making, and power are continuously (re)configured through recursive processes that cut across scales, domains, and organizational principles. Such an approach does not preclude bounded or domain-specific analyses—which illuminate particular mechanisms or settings—but underlines that even seemingly contained political processes are embedded in broader relational fields (Broadbent, 2024; Crossley & Diani, 2018; V. Schneider, 2025).

From this angle, the often-invoked boundaries between institutional and extra-institutional environmental politics constitute one among many provisional distinctions operating within complex systems—merely an expression in a broader network of interdependencies. Research shows, for example, that interactions

between protest movements and institutional politics are central to the formation of movement-party alliances and the configuration of societal divides, particularly in multi-level, multi-actor polities (Hutter & Kriesi, 2019). Climate and environmental actions—ranging from mass marches to community-based initiatives—prompt institutional responses, reshape alliances, and generate new interpretive frames (Ciordia et al., 2025). Due to their porous nature, these cross or intraboundary interactions shape the incentives and constraints that influence how actors coordinate, negotiate, contest, or overlook one another, namely, how their power-laden relationships unfold.

Process-relational approaches push us beyond familiar dichotomies—structure versus agency, individual versus society, or nature versus society (Barnes et al., 2020; Bodin et al., 2017; Dépelteau, 2018; Emirbayer, 1997)—by foregrounding the networks linking local interactions to macro-level patterns, which, through repetition, can become regularized and self-reinforcing over time (Coleman, 1986; Martin, 2009). Such relational accounts of political process enable us to trace how environmental politics takes shape within and across networks: “in institutions, in the holes between institutions, and in the spaces where institutions have not yet formed” (Heaney & McClurg, 2009, p. 728).

## 4. Networks in Relational Environmental Politics

The interdependent nature of environmental politics has stimulated substantial network-oriented research (Scott et al., 2023). To situate relational environmental politics within this perspective, we draw on Podolny’s (2001) distinction between networks as *pipes* and as *prisms*. As pipes, networks constitute the infrastructural channels through which actors coordinate actions and exchange resources. As prisms, networks enable and shape cognitive and symbolic interactions through which actors recognize each other and co-constitute their identities. Across both dimensions, diverse mechanisms shape the micro-interactions that generate, sustain, and dissolve ties—whether due to resource dependencies or symbolic positioning—and importantly, link local interactions to macro-level configurations.

### 4.1. Networks as Pipes

This perspective underscores Coleman’s (1986) call for explicit analysis of micro-macro relationships. Micro-level decisions, such as interorganizational collaboration, are embedded in and conditioned by broader macro-structures, whether network topologies or political contexts. Conversely, aggregating such decisions yields macro-level outcomes—collective action, coalition structures, or policy outputs—that are themselves networked products and processes. Likewise, the workhorses in network modelling, namely Exponential Random Graph Models and Stochastic Actor-Oriented Models, formalize this assumption by treating macro structures as emergent from locally operating tie-formation mechanisms (Lusher et al., 2013; Snijders et al., 2010).

Existing literature has primarily examined how “pipes” emerge (Ingold & Fischer, 2014; Ocelík, 2022; Ylä-Anttila et al., 2018), yielding valuable insights into the structural drivers of collaboration (Fischer & Sciarini, 2016) and coalition formation (Howe et al., 2021). Yet, this emphasis risks treating network structure as the explanandum rather than as the infrastructure through which environmental and policy outcomes can be analyzed. Recent methodological advances—such as multi-level (Lazega & Wang, 2023) and multi-modal networks (Knoke et al., 2021)—create opportunities for systematic micro-macro

theorization and analysis that move beyond questions of network emergence and better capture the structural complexity of environmental governance networks and processes.

Although environmental networks and governance are widely recognized as complex systems—interdependent, multi-level, and cross-sectoral (Di Gregorio et al., 2019; Thiel et al., 2019)—other defining features of complexity are far less integrated into empirical research. Feedback processes, adaptive agency, and non-linear trajectories (Byrne & Callaghan, 2013) are often under-examined or treated as external context rather than inherent to network dynamics. Likewise, feedback mechanisms that (de)stabilize network structures, such as depoliticization and hyper-politicization (Feindt et al., 2021), remain insufficiently theorized despite their prominence in adjacent literature (Jacobs & Weaver, 2014; Preiser et al., 2018). Greater attention to the dynamic examination of the non-linear, cumulative, and systemic nature of environmental problems, their macro-level outputs, and the genuinely complex adaptability of environmental networks is essential for understanding how these configurations shape—and are shaped by—decisions surrounding environmental problems and solutions. Such a networked perspective on actors, processes, and institutional settings enables a more systematic assessment of the interdependencies between the inputs, mechanisms, and outcomes of environmental politics.

#### 4.2. *Networks as Prisms*

The network as prism metaphor underscores the role of identity within networks and how ties communicate and construct shared meanings. Beyond conveying information about who actors are, ties also contribute to the formation of collective identities and coalitions around shared beliefs or discourses. This prism dynamic is particularly evident in environmental movement networks and, more broadly, in environmental policy networks.

Environmental politics is anchored in a recognizable value system—environmentalism and associated green ideologies. Within environmental activism, networking serves to disseminate values, foster solidarity, and reinforce collective identities centered on ecocentric and social-justice principles, thereby enabling political mobilization (Diani & McAdam, 2003; Saunders, 2013). Strong ties and dense areas of interaction in environmental movement networks frequently signal shared values (Di Gregorio, 2012). At the same time, these networks exhibit internal divisions—for instance, between radical and reformist factions whose willingness to collaborate shifts over time (Ferro, 2025; Saunders et al., 2025). Analyses of information flows, resource exchanges, and collaborative ties reveal meso-level structures that include both coalition-building dynamics and intra-movement antagonisms and contestation.

While a substantial literature investigates what coalesces environmental movement networks (Giugni & Grasso, 2022; Rootes, 1999), studies of anti-environmentalism have grown in importance amid increasing political polarization (Judge et al., 2023; Tindall et al., 2022). Climate obstructionism is central here, with discourse contestation shaping interactions between movements and countermovements (Brulle et al., 2024). Evidence from British Columbia, for example, shows how interactions among pro-environmental activists inadvertently strengthened countermovement cohesion (Tindall et al., 2020). Investigating the value systems, interpretive frames, and discourse practices of both movements and countermovements helps uncover relational processes in cultural change and conflict. Here, the prism metaphor underscores how ties link actors to ideas and how ideas shape environmental networks. Discourse Network Analysis

(Leifeld, 2016) has become a key tool for studying these dynamics in environmental movement, anti-environmentalism, and environmental policy network research. Ocelík (2022), for instance, uses ideational networks derived from media content to trace the roots of climate skepticism in the Czech Republic, showing how anti-environmentalism intensified during President Klaus' tenure.

Policy network analysis has demonstrated sustained interest in both networks as pipes and as prisms. Climate policy network research, for example, shows how ideological polarization shapes the selection of expert information in the United States (Jasny & Fisher, 2019), how subnational actors contribute to polarization and policy stagnation (Fisher & Leifeld, 2019), and how climate polarization is leveraged for electoral gain (Leifeld & Fisher, 2025). Social media analyses have also broadened beyond Twitter. Stoddart et al. (2024) show that Instagram discourse during UNFCCC COP26 largely served to disseminate environmental justice, rights-based climate narratives, and to amplify celebrity-driven environmentalism.

At the same time, information-based, collaborative, and discourse network approaches may struggle to detect covert or opaque processes within environmental politics—particularly those underpinning anti-environmentalism. Lucas (2022) illustrates this through a mixed-methods, critical political economy analysis that maps employment affiliations of former Australian politicians and staffers to fossil-fuel corporations—echoing interlocking-directorate research (Sapinski & Carroll, 2018)—and shows how fossil-fuel interests captured the Australian government. Such work underscores the need for innovative, methodologically flexible approaches to uncover the relational foundations of both structural and instrumental power in environmental networks.

## 5. Future Research Agenda

Throughout this piece, we have sought to foreground relationality in political process as central to understanding multi-level, multi-actor socio-ecological politics. A relational-process approach to environmental politics offers crucial insights into who collaborates, contests, and holds power; how practices and discourses co-constitute environmental ideologies while generating and reinforcing self-organizing heuristics; where conflict, latency, negotiation, and cooperation emerge; and what mechanisms sustain—or potentially transform—the political processes that govern our shared environmental futures.

We argue that connecting networks as pipes and networks as prisms offers valuable analytical leverage in environmental politics. Integrating structural-institutional and discourse identity-forming network processes can illuminate the co-evolution of structure and agency (Leifeld, 2020) in society-environment relations. For instance, comparing or combining discourse-based approaches (Hajer, 1993; Leifeld, 2016) with coordination or belief-based coalition research (Bulkeley, 2000; Kammerer & Ingold, 2025; Ocelík, 2022) may reveal previously overlooked nuances in environmental decision-making.

Important domains, however, remain underexamined. The politics of environmental policy integration (Lafferty & Hovden, 2003) and multi-level environmental governance (Wälti, 2010) warrant further attention within political network research (Cerqueti et al., 2025). While network dynamics are often subsystem-specific (Laumann & Knoke, 1987), environmental objectives must be mainstreamed into sectoral policies, incorporating sector-specific goals (e.g., transport, energy, and land use) and environmental policy objectives. This entails examining integrated or overlapping subdomains such as the climate-nuclear energy

nexus (Schneider, 2025). Likewise, political network analysis has yet to address complex cross-sectoral domains such as the water-energy-food nexus (Shi et al., 2022).

Addressing cumulative, systemic, and “glocal” environmental problems—such as biodiversity loss and deforestation—requires a multi-level governance approach that links international cooperation with local knowledge and action. Integrating the network pipes-and-prisms perspectives can help explain persistent coordination challenges, framing disconnects, and power asymmetries across governance levels. Such asymmetries are particularly acute in the Global South, with local actors often overlooked by higher-level institutions (Bravo-Laguna, 2023; Di Gregorio et al., 2019) and where research is often shaped by West-centric discourses and Global North funding priorities. This calls for incorporating underrepresented perspectives in adaptive governance research (Cleaver & Whaley, 2018), including attention to cross-scale feedback loops, decision-making under uncertainty, and non-linear dynamics (Brown & Westaway, 2011; Bulkeley, 2005; Dewulf & Biesbroek, 2018).

Methodological advances in network research—such as multi-level (Lazega & Wang, 2023), multi-modal (Knoke et al., 2021), and multilayered network models (Battiston et al., 2018; Locatelli et al., 2020)—provide powerful tools to unpack the complexity of environmental networks across entities, subdomains, scales, and relations. Relational Event and Relational Hyperevent Models (Lerner & Lomi, 2020, 2022) can further enable tracing temporal and relational interdependencies in multi-actor event participation, revealing co-participation dynamics in environmental movements and crisis responses (Fernández G. et al., 2025). Additionally, empirical case studies on socio-ecological systems remain essential for testing how network configurations shape adaptive capacity and multi-actor governance outcomes (Barnes et al., 2017). Finally, future work must grapple with the growing complexity and data demands for studying environmental political networks, where modelling advances coupled with discourse and secondary data analysis can mitigate limitations in such a data-intensive domain.

### Acknowledgments

The authors thank the ECPR Standing Group on Political Networks, the reviewers, and the panel participants at the ECPR General Conference for their contributions to this issue.

### Funding

Publication of this article in open access was made possible through the institutional membership agreement between the University of Geneva and Cogitatio Press.

### Conflict of Interests

The authors declare no conflict of interests.

### LLMs Disclosure

We used Grammarly and ChatGPT for language editing purposes.

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