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Leveraging windows of opportunity for expertise to matter in global environmental governance: insights from the United Nations Convention to Combat Desertification

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Introduction: Whether and under what conditions scientific knowledge provided by experts actually leads to political action is a question that academic research in various fields have focused on at length, without reaching a definitive answer. The position of expertise is especially delicate within the global environmental governance sphere containing multiple values, worldviews and epistemological standpoints.

Methods: Firstly, we developed a theoretical model to examine how contextual factors, like institutional design and boundary work dynamics, contribute to expertise influencing global environmental governance. Secondly, we applied this model to the case of the Science Policy Interface to the United Nations Convention to Combat Desertification (UNCCD SPI), using data from semi-structured interviews with SPI stakeholders and participant observation of meetings.

Results: We identified specific dimensions of the SPI mandate that enabled expertise to matter: inclusive membership of practitioners, close interaction between experts and political actors, coordination with other advisory bodies, regular reviews, and a small group size. However, after underpinning the prevailing differences in power between SPI experts and member states in their interactions, we found that international environmental decision-making and its national-level implementation remain ultimately and inevitably subordinated to political actors, making it less likely for expertise to have a significant impact.

Discussion: International expertise for sustainable development can only take advantage of the rare “windows of opportunity” that intergovernmental processes concede for experts to influence policy.

KEYWORDS

expertise, global environmental governance, institutional design, desertification, scientific knowledge, sustainable development, boundary work, influence

Introduction

It is commonly acknowledged that expertise—institutionally mandated groups of scientists and other knowledge-holders that operate in the framework of an international organization—plays a crucial role in the solution of today's global environmental challenges. However, legitimate doubts may be raised regarding this assumption. Does expert advice really matter in global environmental politics? Can the scientific knowledge and evidence that experts provide actually lead to action? If so, under which conditions?

Academic research in various fields, including international relations (IR) and science and technology studies (STS), has focused at length on these questions. In the IR field, the actual relevance of expertise is contested, as constructivist accounts conflict with the neorealist stream which regards scientific advice and expertise, as much as all ideational factors, as epiphenomenal (Berman, 1998, p. 17). Against this backdrop, the contribution of STS scholarship has revitalized the debate over the influence of science and expertise on global environmental policymaking. An interaction between IR and STS emerged, including discussions about the role of institutional design in ensuring an effective relationship between the scientific and the policy sides (Alexander, 2006; Wagner et al., 2023).

While a renewed attention on this topic is desirable, diverging epistemological and normative standpoints between the two fields render the question about the relevance of scientific advice in global environmental governance difficult to be settled. For these reasons, arguments about the influence of expertise on global environmental governance remains a matter of dispute. Influence in this context is defined as activities conducted by a group of experts that change the behavior of actors in a political process e.g., a new outcome text in environmental negotiations (Allan and Hadden, 2017, p. 602). This aligns with the definition by Betsill and Corell (2008, p. 24) on how influence occurs when “one actor intentionally communicates to another so as to alter the latter's behavior from what would have occurred otherwise.” In global environmental governance, this could take the form of policy decisions that closely reflect the scientific advice provided, indicating that the global environmental policy has taken a different direction based on the guidance from experts.

With a view to stimulating the above debate from an interdisciplinary perspective, this paper has a dual ambition of developing a theoretical model and conducting an in-depth case study to offer new conceptual insights. These insights are accompanied with empirical evidence to make sense of the question whether and under which conditions scientific expertise actually matters in global environmental governance.

Conceptually, this paper critically engages with the literature focusing on the impact of scientific expertise on global environmental and sustainability policymaking. It shows the inadequacy of the grand theories and, rather, advocates for an analytical approach that encompasses the lessons learnt from both the IR and STS perspectives, taking into serious account contextual factors. Such an approach could be used by academics as a heuristic device to make sense of the complex and delicate

position of expertise vis-à-vis policy across the various issue-areas of global environmental governance. While emphasizing that scientific knowledge alone is not sufficient to have an impact on policy, the paper acknowledges that contextual factors, such as, institutional design, enhances the capacity of experts to take necessary action to influence policy decisions or outcomes, referred to as agency in this paper. While active expert agency is an important enabler for expertise to matter, we conclude that international environmental decision-making and its national-level implementation remain primarily and ultimately subordinated to states' power and influence.

Empirically, the paper focuses on the unique experience and context of the Science-Policy Interface (SPI) of the United Nations Convention to Combat Desertification (UNCCD) as a paradigmatic case of a scientific advisory body influencing policy based on actual views from members, observers and other stakeholders of the SPI. The UNCCD SPI is an empirically novel case because (1) it is less well-known than other SPIs; and (2) it has a hybrid and unusual institutional design characterized by an increased proximity and embeddedness to its associated policy context. Compared to the other global expert bodies associated with the Rio Conventions, the UNCCD SPI is the youngest and smallest global expert body which differentiates it from the others by being institutionally designed to function within the UNCCD. Thus, conducting an exploratory, in-depth case study of the UNCCD SPI provides us with the opportunity to address this research question of expertise influencing policy, a focus of many related works, in a context which has otherwise been neglected. Aside from Akhtar-Schuster et al. (2016, 2022), Chasek et al. (2019), and Laurens (2023), which all primarily focus on substantive evidence of specific SPI outputs impacting UNCCD decisions, there have been limited academic assessments of this global advisory body since it started operating in 2014. This is especially so from a political science perspective exploring how certain contextual factors play a role in enabling expertise to influence policy decisions. We acknowledge that the empirical generalizability of our findings will be limited due to the UNCCD SPI having little in common with other SPIs. Therefore, this study is mostly theory-building, supported by a paradigmatic case.

The findings from our case study and, more crucially, the analytical framework we developed can also be used by practitioners to navigate the science-policy interface and consider the institutional conditions under which expertise can matter. Concerning the role of policymakers, the framework could guide them into exercising reflexivity: this may entail the recognition that, if expertise is to matter, fostering institutional designs that endow it with more autonomy, while maintaining a proximity between science and policy, is crucial. Regarding the role of experts, our contribution may encourage them to seize contextual “windows of opportunity” to influence policy: as evidenced in our study, despite persisting obstacles, innovative institutional designs such as that of the UNCCD SPI can provide concrete avenues for experts to exercise their agency, making the role of science far from irrelevant. Overall, the key contribution of this study to academia and society is a flexible, practical model that keeps open the possibility for science to get its space, despite the structural constraining conditions.

Theoretical framework

We base our analysis on existing theoretical frameworks from STS and IR focused on the influence of expertise in policy, categorized according to the degree of importance different schools of thought attribute to expertise. We, finally, propose a context-based framework that incorporates the lessons learnt from these different positions to assess the influence of expertise in global environmental governance.

The CRELE model: “expertise as crucial”

In a seminal contribution about the role and effectiveness of science and technology for sustainable development, [Cash et al. \(2003\)](#) developed a theoretical framework based on the three pillars of *credibility*, *relevance*, and *legitimacy* (also known as CRELE). Concerned with conceptualizing the institutional mechanisms or “knowledge systems” capable of harnessing science and technology for sustainability, the framework postulates that a satisfactory combination of the three pillars can create the ideal conditions for linking knowledge to action.

Therefore, an underlying assumption of [Cash et al.’s \(2003\)](#) framework is not only that expertise does matter, but that it is crucial for sustainable development policy. Over the years, the so-called CRELE framework has become a model applied in several studies focusing on the dynamics of science-policy interplay at the international scale, especially in the environmental domain. It has been used, for instance, as a benchmark to expose the limitations of the “linear model” of expert advice ([Koetz et al., 2012](#)) or as a set of attributes for science-policy interfaces ([Sarkki et al., 2015](#)).

The popularity of the CRELE model, manifested in the number and variety of its applications as well as attempts to extend its original scope, is yet matched (and probably facilitated) by the overall vagueness of its initial formulation. Occasionally, this ambiguity has led to heated academic debates about how the model should be operationalized and whether it should be understood in descriptive or prescriptive terms ([Dunn and Laing, 2017](#) vs. [Tangney, 2017](#); [Hansson and Polk, 2018](#) vs. [Belcher et al., 2019](#)).

In sum, besides advocating an optimal integration of its three pillars and upholding the importance of “boundary work” for science-policy interplay ([Cash et al., 2003](#), p. 8087), the CRELE model seems to offer little practical guidance regarding the actual impact that expertise can have on policymaking. This limitation is compounded by the fact that the initial CRELE model does not attach attention to power relations, which could be purposive. However, the CRELE model and associated literature on knowledge co-production has evolved in the past 20 years and started highlighting power imbalances in expertise ([Lemos et al., 2020](#); [Turnhout et al., 2020](#); [Jagannathan et al., 2023](#)). While such recent contributions to the CRELE model recognize power relations and justice, [Turnhout et al. \(2020\)](#) and [Jagannathan et al. \(2023\)](#) also emphasize that references to the role of power dynamics in shaping co-production processes has only been done to a limited extent, as the politics of actionable knowledge are only beginning to be examined. Such a shortcoming is partly (although not fully) shared

with the “expertise matters” literature featured in the next subsection.

“Expertise matters”

The understanding that scientific and expert advice can have an impact on policy is inherent in constructivist social science approaches. Within the STS literature, this is enshrined in seminal concepts such as boundary work, hybridization and coproduction ([Gieryn, 1983](#); [Latour, 1993](#); [Jasanoff, 2004](#)). In fact, while STS scholarship resists the idea of a strict and essentialist separation between an “expert” and a “policy” side, it still recognizes that a socially constructed and relational division of labor between the two is necessary for the production of social order. Against this backdrop, with a view to conceptualizing the conditions for an effective dialogue between expertise and policy, the question of the “ideal distance” that experts should keep from policymakers has been at the core of several theoretical discussions and contributions within the field ([Gieryn, 1983](#); [Weingart, 2002](#); [Pregernig and Böcher, 2012](#)).

STS-oriented contributions concentrating on the global scale built on this proximity-distance (or integration-separation) question by setting institutional arrangements as their central focus ([Sundqvist et al., 2015](#); [Thoni and Livingston, 2021](#); [De Donà and Linke, 2023](#)). Other contributions building on STS concepts such as *boundary organization* and *hybrid management* ([Guston, 2001](#); [Miller, 2001](#)) did emphasize the agency of scientific advisory bodies, although providing just hints of their political influence ([De Donà, 2021](#)).

The IR field has been less vocal than STS on the role of expertise and scientific advice, as meaningful engagement with the topic can be found only in the constructivist scholarship. Although at least three different generations of expertise studies can be identified in IR ([Bueger, 2014](#)), the *epistemic communities* theory ([Haas, 1992](#)) remains the most influential IR contribution dealing with experts’ agency and its causal influence on international politics. Based on the essentialist assumption of a division between the policy and expert sides, Haas advanced the argument that an epistemic community needs to be insulated from political influence in order to matter ([Haas, 2004](#)). According to this view, science has been unable to make an impact toward solving climate change because it could not remain untainted by politicization: in Haas’s words, it is kept on a “tight leash” by policy ([Haas, 2004](#), p. 583; [Haas and Stevens, 2011](#)). Along the lines of STS challenges to these ontological and explanatory claims ([Lidskog and Sundqvist, 2015](#)), other IR constructivist accounts contested the idea of separation between the two domains of science and policy. [Allan \(2017\)](#) did so through an STS-inspired co-productionist approach, drawing attention to the process by which the global problem of climate change was constructed, yet without a particular concern for the agency and power of experts and advisory bodies. Finally, within the global governance literature, [Sending \(2015\)](#) downplays the idea of epistemic communities as agents with inherent special

attributes, claiming that epistemic authority and competition for it are empirical questions that require to be studied through a sociological approach.

To sum up, compared to the literature based on the CRELE model, most of the accounts outlined here give more attention to power relations in the framework of the relationship between science and policy. In spite of this, attempts to produce detailed and in-depth theoretical accounts of the conditions in which expertise can matter on global environmental governance are limited.

“Expertise does not matter”

Despite displaying a variety of ontological and normative positions, the STS literature does not really call into question whether expertise actually matters. By actively and critically engaging with expertise, it de facto acknowledges its relevance. Challenges to this understanding are rare and likely to arise only within the broader sociological field. For instance, [Grundmann and Rödder \(2019, p. 3887\)](#) seem to hint at a hierarchy between politics and science by arguing that “scientific knowledge alone is rarely effective in compelling public policies” and that “it might be more appropriate to think of scientific consensus as serving a policy function.”

Things are quite different in the IR field. Outside the constructivist strand, the status of expertise has traditionally been disregarded. While liberal institutionalists may concede a causal role for ideas in contributing to policy outcomes ([Goldstein and Keohane, 1993](#)), neorealists would actually dismiss the value of scientific advice as epiphenomenal, along with the whole idea of international environmental regimes. As [Krasner \(1982, p. 204\)](#) puts it, knowledge can only matter if it is widely accepted by policymakers: without broad consensus, it has “little impact on regime development in a world of sovereign states.”

Other realist positions which bluntly deny a role for expertise and scientific advice in global environmental politics, arguing that the role of epistemic communities is overrated and that these communities have a negligible impact on the negotiation and formation of international environmental regimes ([Susskind, 1994](#); [Drezner, 2008](#)). Rather, as [Hickmann \(2014, p. 39\)](#) argues in his study on the ozone and climate regimes, “national interests considerably influence the production and interpretation of key scientific findings,” implying that national politics prevail over scientific evidence throughout the policy cycle.

In short, although not all of the above positions fully discount the idea that expertise can exercise some agency in international environmental governance, the general orientation is that political actors (i.e., states) are in firm control of intergovernmental policy and that their sovereignty can hardly be challenged by non-state actors, i.e. experts.

On a “loosened leash”? Context matters

The answer to the question whether science and expertise matter in international environmental politics is highly contested. This paper does not aim to settle the debate and cannot provide

a definite answer to the question. Instead, by rejecting approaches based on grand explanatory theories, it provides an analytical framework that significantly incorporates contextual factors.

As a starting point, we argue that it is crucial to recognize that the question is made particularly challenging by the complexity of the global sphere, particularly regarding environmental matters, where a multitude and variety of values, worldviews, political cultures, definitions and standards of expertise, and epistemological standpoints meet ([Miller, 2001](#); [Beck and Forsyth, 2015](#); [De Donà, 2022](#)). We argue that this complexity makes it difficult to propose a theory that is applicable to all global environmental contexts. A case in point is the overly optimistic application of the “epistemic communities” theory to the climate change domain. On the other hand, overly pessimistic views about the role of expertise are not always matched by empirical evidence.

Reflections on the epistemic complexity of global environmental governance are not new. To make sense of the formation of environmental regimes, [Dimitrov \(2003, p. 145\)](#) suggested to ask the question “what kind of scientific information matters” (rather than “does science matter?”), proposing to disaggregate scientific knowledge into categories. Although Dimitrov’s approach can yield analytical benefits by providing a more in-depth dissection of the features of expertise, it is problematic since it also displays a tendency to disaggregate knowledge from power.

We argue that, instead of ontologically separating expertise from politics, it is more fruitful to consider specific science-policy contexts in their wholeness, focusing on both the structural and agential aspects that contribute to shape them.¹ From the evidence-based assumption that UN member states tend to keep expertise under relatively strict control in international environmental settings such as climate change and biodiversity ([Haas, 2004](#); [Hotes and Opgenoorth, 2014](#); [Díaz-Reviriego et al., 2019](#)), we claim that contextual aspects such as institutional design deserve to be closely scrutinized when assessing the impact of expertise on global environmental fora.

[Alexander \(2006\)](#) defines institutional design as the formation and reforms of the rules, procedures and structures constituting an institution in order to better achieve its mission. In our study, a particular institutional design means a context which can be shaped by structures (e.g., world economy; UN system) but also actors (e.g., member states). [Voeten \(2019\)](#) created a typology to explain the different ways structured institutions were designed. Relevant to this study are the process-related concepts of historical institutionalism and world polity (structural process), basing their assumptions that pre-existing institutions—historically and within the UN fora—shape the institutional design of a science-policy interface.

While we acknowledge the importance of this framework in investigating institutional design, the focus of our analysis on the institutional design of international expertise is identifying structural aspects, specifically the formal rules and procedures, of

¹ In this respect, we align with recent literature emphasizing the importance of considering power dynamics at the science-policy interface, particularly in a problem context characterized by uncertainty and epistemic complexity ([Lemos and Klenk, 2020](#)).

the advisory process affecting the extent that expertise matters in global environmental governance. Previous studies on science-policy interfaces have also examined how particular characteristics of the institutional design contribute to the capacity of SPIs influencing policymaking (Haas, 2017, p. 221; Wagner et al., 2023) along with highlighting research needs for understanding knowledge co-production processes to determine the casual influence of global environmental assessments (Kowarsch et al., 2017, p. 380).

However, while institutional design is a valuable starting point to study the relationship between science and policy in United Nations settings, excessive analytical reliance on this aspect risks downplaying the socio-political dynamics characterizing the science-policy interplay. In particular, drawing on the STS tradition, we conceive of these dynamics in terms of boundary work (Gieryn, 1983). The concept of boundary work pertains to the strategies by which expertise attempts to preserve its autonomy and defend its epistemic authority (Jasanoff, 1990; Beck and Mahony, 2018). Notably, capturing a process of continuous re-demarcation of the role and scope of expertise vis-à-vis the policy side, boundary work allows to account for the informal and performative dynamics of contestation that characterize the interplay between science and politics (Gustafsson et al., 2019; Wiegler and Bruns, 2023).

Based on the above, we consider boundary work dynamics as the informal component of institutional design, contrary to the formal rules and procedures mentioned previously, due to its relative unpredictability. Boundary work is a crucial aspect to study because of its potential in both undermining and elevating the role of rules and procedures in helping expertise influence policymaking. However, in the context of intergovernmental negotiations, we recognize that boundary work is not always successful for expertise. In fact, although the latter makes efforts to retain its epistemic authority, boundary work is prone to be constricted and uneven, as the policy side can exercise its influence through favorable institutional arrangements.

In this analytical framework, we therefore specify how both these aspects enhance or constrain the agency of epistemic communities (more familiar to an IR audience) and boundary organizations (more familiar to an STS audience). In spite of structural conditions, these actors may be able to seize windows of opportunity to escape tight state control and benefit from a “loosened leash” for experts to ultimately get the space needed to influence policy. Only in that position, they may be able to “act as agents of complex learning, enabling other agents gradually to develop shared interpretations of a given problem” (Le Prestre, 2017, p. 69).

To sum up, we propose an analytical framework composed mainly of two components, institutional design and boundary work dynamics, which represent the key contextual factors enabling expertise to matter. A third essential component of our framework is the “window of opportunity” embodying “specific moments, modes and loci for action” (Stirling, 2014, p. 7) in an advisory process where experts can have direct influence on policy. Taking stock of some of the lessons learnt in the STS and IR literatures, the analytical framework is based on a more balanced approach to the question about the influence of expertise on global environmental policy. Attempting to give justice to the

power relations that characterize global environmental governance landscapes, it emphasizes the importance of structural aspects, without fully discounting the agency of expertise.

Lastly, we want to reiterate that institutional design and boundary work are just two broad categories out of several contextual factors that contribute to the influence of expertise in global environmental governance (Brachthäuser, 2011; Little, 2012; Nyhlén and Lidén, 2014; UNEP, 2021). Scholars claim that third party interests, catalyzing events, changes in political regimes, the scale of the environmental problem, among other factors external to global environmental political institutions where expertise is situated, can induce changes in decision-making (Soomai, 2017; Spence, 2017; Wall et al., 2017; Dunn et al., 2018; Matsumoto et al., 2020; Kieslich and Salles, 2021; Wagner et al., 2023). Nonetheless, there is still minimal data available on these external factors as relevant literature has mostly focused on analyzing factors directly related to the institutional design and boundary work of expertise. Thus, while we are unable to assess these factors in this study, we included a component for “external factors” to make our framework more comprehensive and representative of the broader literature.

Research design and methods

This study employs both inductive and deductive reasoning by using pre-existing concepts from two different fields, to create a new theoretical architecture that moves across different ontological perspectives from STS and IR. To operationalize our theory, we used a single case study approach and adopted a fixed purposive sampling strategy (Bryman, 2012), selecting the Science-Policy Interface (SPI) of the United Nations Convention to Combat Desertification (UNCCD) to identify contextual variables and explore how they factor into expertise mattering in global environmental politics. This case study offers the possibility to build the theoretical framework presented above, allowing an in-depth analysis of the phenomenon in context and leading to the identification of additional variables involved in bridging—or expanding—the science-policy divide. While it is not possible to generalize or directly apply the results to other cases, we do not rule out the possibility that new SPIs may emerge within institutional settings and based on institutional designs analogous to those of the UNCCD SPI. Moreover, we believe that our theoretical framework may still be analytically applied as an ideal type or heuristic device in the framework of other cases. In such potential applications, we also envisage that our proposed framework may be reconceptualized and/or become part of a broader typology.

We selected the UNCCD SPI because we considered it a paradigmatic case of international expertise mattering in global environmental governance, valuable in producing context-dependent knowledge (Flyvbjerg, 2006). The UNCCD SPI is significantly under-researched even if it shares many similarities with other global expert bodies such as the Intergovernmental Panel on Climate Change (IPCC) and the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) in its role of providing knowledge on global environmental problems to the Rio Conventions. However, it is unique in its institutional

embeddedness in a political convention, making it a valuable case to explore further.

The UNCCD SPI is a paradigmatic case by centering context in the debate on the influence of expertise in global environmental governance. This case has the potential of operating as a reference point by being unique in its contribution to the growing IR and STS literature on epistemic communities and boundary organizations as the UNCCD SPI has until now mainly been investigated by natural scientists, many of which are former members of the expert group (Akhtar-Schuster et al., 2016, 2022; Chasek et al., 2019). Applying a critical social science lens to how the SPI operates will complement and enrich the ongoing academic discourse which has otherwise been predominated by case studies of the IPCC and IPBES.

A detailed and up-to-date assessment on the UNCCD SPI and the contextual factors contributing to its successes and limitations in influencing policymaking is also very timely as the UNCCD (2022) is conducting a second review of the work of the SPI to be presented in December 2024. A case study of this SPI will not only complement this formal review but will also elevate the UNCCD and the SPI in relevant literature. Furthermore, the topic and context of this case study is aligned with the vast amount of academic and civil society work emerging on the complex epistemic context of land degradation. This issue has increasingly been placed high on the political agenda as more policymakers recognize that land lies at the root and the solution of the multifaceted environmental crises we are currently facing, necessitating tailored expert advice throughout the policy cycle (Montanarella and Alva, 2015).

For this study we collected qualitative data through semi-structured interviews and participant observation. Altogether, we conducted 28 interviews between 2017 and 2022 with SPI members and observers, the UNCCD secretariat, the UNCCD member state delegates [specifically, correspondents to the convention's Committee on Science and Technology (CST)], and former SPI members. We used a mix of snowball and convenience sampling methods to identify research participants with the aim of achieving a balance in gender, regions, and stakeholder groups. Most interviews were conducted in person at the 14th and 15th Conferences of the Parties (COP) to the UNCCD which were held, respectively, in New Delhi, India, in September 2019, and Abidjan, Côte d'Ivoire in May 2022. A few interviews took place online through Zoom following the two conferences.

We asked research participants questions on the role of the SPI in the UNCCD, the influence of its knowledge on policymaking, and its overall strengths and weaknesses. The key focal questions are listed below:

1. What is the role of the UNCCD SPI?
2. What are the strengths and the weaknesses of the SPI?
3. From your experience, are there member states that are particularly happy with the SPI or particularly eager for it to continue?
4. Regarding the relation between the COP and the SPI: is it merely a top-down process or are there situations in which the SPI can actually take an active role and bring something to the attention of the COP?

5. How authoritative is the knowledge and expertise of the UNCCD SPI in policymaking? at what governance levels is it most and least authoritative?
6. What would you change about the SPI's institutional design to increase its legitimacy/effectiveness?

Observations from the session of the CST at UNCCD COP15 complemented the interview data by garnering critical insights from the live interactions between scientists and policymakers in intergovernmental settings.

In this study we used directed content analysis to analyze the transcribed interview data and field notes, which involves the analytical development and application of codes to identify key themes emerging from the qualitative data (Berg and Lune, 2017). Although our analytic codes were mainly deductive and guided by the framework presented in Section On a "loosened leash"? Context matters (which pinpoints the overarching contextual factors for the influence of expertise on policy), inductive insights obtained from the empirical material contributed to the development of the theoretical framework. The key deductively-generated components of this analytical framework are institutional design (formal rules and procedures) and boundary work between member states and expertise (informal science-policy interplay), while the inductively-derived component are the "windows of opportunity", that expertise can seize to influence policy-making.

After analyzing the data with these underlying components (or themes) in mind, we developed a code frame, using Microsoft Excel, listing codes that emerged from the interview data and field notes. The codes, also known as categories, were given "categorical labels" and detailed descriptions, as guided by Berg and Lune (2017, p.184). Some of the categories contained sub-categories (also known in the literature as individual codes), which were encapsulated in the code descriptions. Relevant phrases were extracted from the qualitative data (interview data and observations were separated into two different columns) and sorted according to the categories, unveiling "meaningful patterns and processes" in the data (Berg and Lune, 2017, p.184). Through this method we were able to identify which themes appeared more or less across all the interviews and field notes, allowing us to make inferences in light of previous literature.

Results

History and background of the UNCCD SPI

Our case study is the UNCCD SPI which is the main expert advisory body for the UNCCD, one of the three Rio Conventions established in 1994 as a result of the "Earth Summit", held in Rio de Janeiro in 1992 (Najam et al., 2006). The UNCCD is broadly recognized as the "sole legally binding international agreement linking environment and development to sustainable land management" tasked with addressing the global problem of land degradation and desertification (UNCCD, 2022). The decision to establish the SPI was made in 2013 during COP11 to "facilitate a two-way science-policy dialogue and ensure delivery of policy-relevant information, knowledge and advice on desertification/land degradation and drought" (UNCCD, 2022). The lead up to its formation is founded on rich discussions and pivotal events

on science-policy since 2000, informing the overall design of the institution.

Attempts to strengthen the scientific basis of the UNCCD started at COP4 where several member states raised concerns on the ineffectiveness of the CST, one of the COP's subsidiary bodies (Laurens, 2023). While the CST was intended to function as the main platform for decision-makers to receive scientific advice (Martello, 2004; Bauer and Stringer, 2009; Grainger, 2009; Laurens, 2023), it served a more political role being comprised of member states rather than scientists (Akhtar-Schuster et al., 2016, 2022). The UNCCD initially decided to address the flaws of the CST by creating a group of experts to provide external inputs of knowledge from 2001 to 2007, followed by “a series of biennial UNCCD scientific conferences, which discuss scientific knowledge on a theme chosen by the CST” (Akhtar-Schuster et al., 2016).

During COP10, an *ad hoc* working group on scientific advice (AGSA) consisting of 12 independent scientists was created by the secretariat to address the ineffectiveness of prior mechanisms to regularly provide and clearly communicate sound scientific and expert knowledge on land-related matters to policymakers (Akhtar-Schuster et al., 2016; Laurens, 2023). Ultimately, AGSA recommended the formation of a structured, mandated science-policy interface made up of scientists from multiple disciplines and representatives from the UNCCD (Akhtar-Schuster et al., 2016). As a result, the UNCCD COP implemented the recommendation of AGSA and set up the mandate for the SPI, which has most recently been renewed until COP16 when a review of the SPI was presented (UNCCD, 2022).

The mandate dictates the membership, functions, procedures and rules of the SPI, under the leadership of the bureau of the CST (UNCCD, 2022). As of 2022, there are 25 members of the SPI made up of five members of the CST bureau, five regionally selected scientists, 10 independent scientists nominated by the CST bureau through an open call, and five observers from civil society, international organizations, and UN organizations (UNCCD, 2022). The SPI is co-chaired by the chair of the CST bureau and a scientist selected by the SPI members.

The SPI meets several times a year, including at each UNCCD COP where it presents its latest thematic reports containing synthesized policy recommendations on select themes requested by the COP, in addition to proposing a new biennial work program for the consideration of the member states (UNCCD, 2022). Other outputs include policy briefs focusing on priority topics of the UNCCD, such as, land degradation neutrality (LDN),² assessing soil organic carbon, and enhancing drought preparedness (UNCCD, 2022). The SPI is also mandated to coordinate with other scientific bodies, processes and networks relevant to the UNCCD objectives, typically involving the peer review of other scientific assessments and communication of knowledge requirements by the UNCCD.

² Land degradation neutrality (LDN) is defined by the UNCCD as “a state whereby the amount and quality of land resources necessary to support ecosystem functions and services and enhance food security remain stable or increase within specified temporal and spatial scales and ecosystems” (decision 3/COP.12, UNCCD, 2015).

Features of institutional design shaping expert agency in the UNCCD: strengths and weaknesses of the SPI mandate

The overall perceptions and knowledge of stakeholders of the SPI indicated that the purposive actions made throughout the evolution of the institutional design of the SPI in the past 10 years played a significant role in strengthening the potential of expertise to matter in UNCCD decisions. The mandate and its accompanying rules and procedures were highly cited across the interviews as a core factor shaping expert agency in the UNCCD, with several stakeholders referring to how the inclusive membership and participation, coordination with other scientific and political bodies, and regular reviews of the SPI facilitated the influence of the SPI in global environmental governance.

Multiple stakeholders of the SPI agreed that the inclusive membership offered by the mandate, consisting of both policymakers (specifically, CST bureau members), independent experts and observers, accrued several benefits, allowing frequent two-way dialogue for experts to better understand policy needs and for policymakers to retrieve direct advice from scientists on pressing issues. One interviewee compared the experience of working in the SPI to working as an author of IPBES reports: “we don't sit with policymakers on assessments but sitting in a room as an SPI [member] with scientists and policymakers, you can put out some information in a language that does not sit well or does not make sense and we can be told that right in real time rather than it [comes] from a review process...” (Interview 18).

By integrating these two communities within this advisory body they streamline the process, making it more efficient in breaking communication silos, formulating recommendations acceptable for policymakers, while also maintaining the scientific credibility of the technical reports provided to policymakers. One of the benefits an interviewee described, while also a challenge, was scientists learning how to write condensed, policy-specific documents after being asked by CST members to tell the policymakers what to do. This would not have been possible if it were not for the institutional design allowing scientists and policymakers to work so closely together to meet the demands of the UNCCD COP.

Another unique aspect of the membership of the SPI is that it gives civil society organizations and early-career scientists not just the role to observe but also the opportunity to participate in the preparation of policy reports. Many stakeholders interviewed, particularly observers, commented on how they were considered as working members of the SPI which provided a win-win solution: giving civil society ownership in SPI outputs and bringing in a broad range of perspectives from practitioners working on the ground on issues of land degradation and restoration. The SPI recognized the importance for practitioners to be included beyond pure observation for the credibility of the institution providing knowledge on transdisciplinary topics requiring actionable, cross-scalar solutions. Three interviewees stated how it is primarily practitioners, rather than independent scientists, that can advise on this based on their experiences from the ground as well as their motivation to provide understandable recommendations on land use for all facets of society, not just policy.

A few stakeholders agreed on the important role of the shorter duration of the assessment cycle and regular review of SPI operations as an enabler for expertise to matter in the UNCCD, specifically allowing the SPI to more effectively meet policy needs. Compared to other expert groups, the SPI operates in 2-year work programs, purposely set by the CST so that experts can more quickly provide sound and timely knowledge required by policymakers to address the rapid rise in land degradation. An interviewee remarked on how the work program also “showed some flexibility in taking up upcoming issues and topics, which I think for the secretariat was quite a good thing” (Interview 12).

Additionally, interviewees commended the SPI for conducting reviews after each work program, learning from and overcoming its limitations resulting in regular revisions of its institutional design based on external feedback from member states in the CST and other UNCCD stakeholders. An interviewee mentioned that when the SPI was established, it had the benefit of learning from the mistakes made by older, pre-established expert groups, culminating in a decision made in 2015 “which enabled the SPI to have more flexibility in maneuvering to decide itself what sort of form it wants to use to interact with different expert groups” (Interview 27).

It was also based on this decision that the SPI is mandated to coordinate with other scientific and political bodies leading to frequent communications and collaboration between the SPI, IPCC, IPBES, the Intergovernmental Technical Panel on Soils, among others. The majority of the stakeholders interviewed valued this component of the mandate, suggesting it as pivotal in enabling the expertise of the SPI to matter within and beyond the UNCCD. The coordination activities of the SPI were cited as a way to, firstly, avoid the duplication of efforts and, secondly, to ensure land issues are taken into account in the reports by other scientific panels (UNCCD, 2022).

As a result, the SPI fills a critical role of bridging the gap between these expert groups and the decisions that follow in the other Rio conventions, further building on the work they are doing in a complementary role. As one interviewee stated, the SPI is “tasked to address bottlenecks” which explains why the topics of their thematic reports, e.g., integrated land use planning, tend to be so narrow. Furthermore, this allows SPI members the time to review, comment, and contribute to other relevant scientific reports. Several interventions by member states observed during COP15 commended the SPI for its frequent coordination with other scientific panels, emphasizing its necessity in breaking silos and increasing the widespread dissemination of expert inputs on land-related issues.

Prior literature and interviewees highlighted two non-purposive characteristics of the institutional design which have elevated the role of the SPI in policymaking on land degradation and restoration: firstly, the small size of the SPI, and, secondly, the scientific foundation of the UNCCD. While being the smallest advisory body among the Rio Conventions may hamper the capacity of the SPI to fulfill more functions and achieving a higher level of impact through its reports, it makes it easier for more non-governmental voices to be heard by policymakers and facilitates access of experts to entry points of the decision-making process.

Many stakeholders agreed that increasing the number of permanent members of the SPI would make it more difficult

and complicated to manage at its current state of capacity. Thus, whenever they lack experts on certain topics they were mandated to report on, they make a call for external experts to contribute to the preparation of thematic reports, essentially filling the knowledge gap. One interviewee explains that by being small in size, the SPI has more flexibility to nominate experts based on scientific excellence when they request support from the international scientific community on thematic reports, unlike the other scientific panels who have stricter and more drawn-out nomination processes. Hence, the small size of the SPI helps streamline the advisory process enabling experts to provide timely and diverse scientific advice in a short time span.

Akhtar-Schuster et al. (2016) referred to Articles 16 and 17 of the convention that emphasize the importance of science for the “sustainable use and management of resources... that improve the living standards of people in affected areas” suggesting that the unique hybrid environment-development nature of this convention necessitates a strong, interdisciplinary evidence base. We can deduce that the strong scientific emphasis in the convention could be a contributing factor to how closely connected the SPI is with the UNCCD secretariat, making it more independent and less controlled by member states “...so that we can really just be focused on what we think is important and focus on our knowledge and best recommendations as possible,” as reflected by one of the interviewees.

Other interviewees observed this close connection between the SPI and UNCCD secretariat, explaining that while technically the COP tells the SPI what to do, in practice the SPI is making its own decisions on its work program in close consultation with the secretariat, in the guise as a “proposed” work program with likely approval by the COP. One interviewee attributes the direct role the SPI plays in the UNCCD to the convention’s recognition on the importance of a strong scientific basis for achieving the UNCCD objectives.

In sum, the interviewees largely favor the mandate and the embeddedness of the SPI in the UNCCD, regarding the institutional design of the SPI as uniquely situated in shaping the influence of expertise in global environmental governance. Nevertheless, there were mixed views among interviewees on the rigidity of the mandate. Some interviewees considered a rigid and independent mandate, characterized by a narrower scope that limits closer interactions between SPI members and member states, was beneficial in protecting experts from being distracted or influenced by member states to expand their scope according to their respective interests. Ultimately, this preserves the scientific integrity of the SPI and prevents the politicization of its outputs. Observations from COP15 support this notion, with the UNCCD secretariat and SPI members rejecting calls from different member states for the SPI to provide knowledge on topics that are outside the mandate’s scope and mostly meeting domestic agendas.

Other interviewees contradicted these views, claiming that a narrow scope and rigid mandate constrains expert agency in influencing the agenda for policymakers and limits opportunities for experts to highlight overlooked, yet important topics. As one interviewee stated: “the SPI does not go beyond its mandate. And it should not, also because it is not a purely scientific body” (Interviews 13–14). This statement emphasizes the high level of

stringency of the SPI mandate. Furthermore, it illuminates the contrast of the SPI with the institutional design of the other global expert groups, IPCC and IPBES, which are more autonomous as “[they’re] less linked with the UNFCCC and CBD” (Interview 1). The interviewees comment on how an independent legal status from their associated conventions grant these other expert groups more scientific freedom to set their own agenda while also meeting the knowledge requirements of the UNFCCC and CBD. Meanwhile, the SPI is limited to its requirements within the boundary of the UNCCD where a COP bureau reviews the technical reports of the SPI restricting it from being used by anyone, as commented by one interviewee.

This aligns with our observations of CST sessions where a majority of the member states commended when the SPI met the mandate and criticized when the SPI attempted to go beyond the mandate. For example, we observed a member state from the Global North bothered by the contribution of the SPI to other reports “which are not forwarded to member states concerned by the convention in the fight of desertification.” SPI members were also repeatedly reminding member states that they are unable to cover certain topics they request because it is not within their mandate, or the topic is “too political”.

An implication of a narrower scope as a result of a rigid mandate is the limitation of working at one scale. Four interviewees agreed that expertise could matter more if the SPI mandate expanded to provide knowledge from multiple scales, particularly sub-regional where most impacts of land degradation and desertification are felt. By restricting the mandate to providing expertise on these topics at global and regional levels, the thematic reports will not be relevant to decision-makers at national and local scales. It would also require disseminating and presenting the reports to policymakers through regional meetings, as suggested by one interviewee, which demands more financial and human capacity.

We observed a few member states in the CST sessions which requested the SPI to engage with regional and sub-regional scientific institutions and to ground the theory of land restoration in national contexts so that member states understand how to more practically implement the SPI’s policy recommendations. Typically, civil society organizations adopt the role of informing national and local stakeholders on the recent syntheses provided by the SPI, which they explicitly mentioned in their intervention at the CST session when requesting greater synergies with the UNCCD SPI in communicating their policy recommendations.

Expertise mattering in a constricted intergovernmental context: uneven boundary work and influence of state power over the UNCCD SPI

While we have ascertained the crucial role of the institutional design in this unique case of the UNCCD SPI influencing COP decisions, the question that remains is to which extent this institutional design is an actually decisive enabler. According to our analytical framework, we presume that boundary work between powerful political actors and experts in the UNCCD SPI are the

true drivers of expertise mattering in UNCCD decisions. Despite attempts to get some space on the part of the expertise side, both the interviews and observations from the CST sessions confirm the presence of key political factors influencing the process whether it is driving skepticism or garnering support for the SPI and its activities.

Our interview material suggests that boundary work began even prior to the establishment of the SPI: while some member states were reluctant about its establishment (Interview 3), the technical process leading to creation of the platform [including the preparatory work conducted within the *ad hoc* Advisory Group of Technical Experts on Impact Indicator Refinement (AGTE) and AGSA] took place without substantial policy interference (Interview 5).

Some interviewees described how many of the member states in the Global North do not value the UNCCD, therefore, providing minimal support for its subsidiary bodies and expert group. The lack of support from these member states may be linked to the lack of financial and human capacity cited by five interviewees and observed in interventions by member states as a barrier in enabling the expertise in the SPI to matter in the UNCCD. The same interviewees collectively agreed that the SPI could be more influential if it had sufficient resources for a broader dissemination and communication of their reports, matching the extensive outreach done by other global expert groups. However, as one interviewee stated, “the SPI needs to have a formal status in the UNCCD... and this would support the SPI immensely in being better resourced” (Interview 27).

Three interviewees mentioned how some member states characterized by their high deforestation rates were actively manipulating the language of the SPI technical reports so that it conformed to their agenda. One interviewee remarked on how this manipulation of the process and control over the thematic focus of the work program negatively impacted the SPI by delaying meetings and creating a constrained environment for experts mandated to respond to each comment and adjust their reports according to the requests of member states. An interviewee retold an instance before the SPI was established, in 2009, when one member state managed to block proceedings of a scientific conference for a whole day.

While our evidence was unable to indicate the specific reasons behind some member states criticizing the SPI and its outputs, it was clear, based on the anecdotes from interviewees, that skeptics strived to preserve a strict mandate and maintain a boundary between science and policy. By keeping science and policy separate, member states prevent experts from having “too much” agency in negotiations and restrict them to their role of solely providing knowledge at the request of member states. In order to avoid potential clashes with member states during boundary work, SPI members became aware of the different interests and prevailing conflicts between member states in the UNCCD making them more sensitive to controversial issues when formulating the recommendations “so that you don’t polarize too much” (Interview 10).

The avoidance of discussing controversial topics, such as land tenure, may have stemmed from certain member states in the Global North criticizing the SPI for “overstepping” in its recommendations during one of the UNCCD COPs, as noted by

another interviewee (Interview 11). Meanwhile, member states from the Global South, especially in Africa, were viewed as staunch supporters of the UNCCD and its SPI, with one interviewee claiming how African countries were essential in pushing forward the LDN process. Two other interviewees specifically mentioned how European countries were very supportive and even instrumental in the formation of the SPI, recognizing the need for scientific advice tailored to land use issues.

Regardless of how appreciative member states are of the SPI and its contributions to the UNCCD, our findings from interviews and observations suggest that the SPI and its capacity are in the hands of political actors. The SPI satisfies most of the requests of member states by making changes to their work program and procedures as long as it is justified and does not infringe on its scientific credibility. With member states bending the words of the SPI technical reports to fit their national agendas, we recognize that international environmental decision-making is ultimately and inevitably subordinated to member states' interests and power, making it unlikely for SPI experts to have an impact on nationally led stages of the policy cycle (Hickmann, 2014).

UNCCD SPI matters in desertification governance by seizing “windows of opportunity” to influence policy

In spite of the shortcomings of the institutional design and the constraints caused by a strict mandate enforced by powerful political actors, interviewees provided ample evidence of experts becoming active agents in making the UNCCD SPI an influential, evidence-based decision-making body throughout the development of the convention. While the interviewees were careful in saying that some of the SPI members are driving the process, they explained how there are key actors from the advisory body who are active in reaching policymakers and providing tangible policy options without being too prescriptive. These particular actors in the SPI managed to escape the tight grip that some member states hold and, instead, seized “windows of opportunity” to inform policy, ensuring their knowledge on land is actually used.

Experienced SPI members who were involved in the UNCCD before and after the SPI was established noted how the SPI was instrumental in conceptualizing LDN, putting the convention “on the map” as a scientifically backed decision-making body. Some interviewees even made claims on how “all the work taking place in the CST is done by the SPI” (Interview 12) and that “there is a direct acceptance of our reports into direct policy documents of the CST” (Interviews 15–16). Another interviewee stated how, as a result, the LDN conceptual framework was mentioned in the IPBES report on land degradation and restoration and the IPCC report on land and climate change. Aside from LDN, reports on drought and integrated land use planning were also mentioned by interviewees as important SPI outputs directly taken up in COP decisions.

Some interviewees with significant experience attending UNCCD COPs referred to how the formation of the SPI marked a turning point for the UNCCD, providing the scientific backing the convention initially lacked. We can trace this result to a few

leading experts with sufficient agency to enable changes in the design of the institution for how expertise enters policymaking in the UNCCD. They shaped the institutional design in a way that met the demands of member states through a somewhat strict mandate, while also being flexible in providing experts an opportunity to use a “policy window” in making their voices heard. This allowed situations where “end decisions that are being made at the policy level are often a diluted version of what the scientists probably have put on the table” (Interview 10). Altogether, the progress the SPI has made in contributing to UNCCD decisions in the past 10 years have led to SPI members feeling well-appreciated by delegates of member states:

“My experience has been when presenting at the COP and working with the CST bureau who sits with the SPI is that there is a lot of listening. I think they have more authority here than any other place in my professional place. It’s been incredibly gratifying and rewarding as a scientist to come off the stage after presenting our technical report and different delegates saying thank you, what you are doing is really important and we are listening. And so that is not always the case in all the different spheres in which we share our scientific information.” (Interview 18)

Several interviewees cited similar moments, also observed during the CST session at COP15, where member states expressed immense gratitude to the SPI and its guidance in formulating their policy documents. Delegates of member states are especially supportive of efforts by the SPI in making the language of the reports less technical as well as for its “continuum of knowledge” (Interview 24). While most appreciation does not automatically imply influence on policymaking, it can be an enabling factor for it since it enhances the legitimacy of the SPI.

By successfully completing three biennial work programs since its inception and continuing to be considered as a valued, important member of the UNCCD by majority of member states and the secretariat, the UNCCD SPI is a case where expertise matters in policymaking, yet only to a limited extent.

Discussion

The framework we developed provides an opportunity to learn how the agency and inputs of international expertise matter based on critical factors related to its institutional design and the boundary work involved. Applying this framework to the single case study of the UNCCD SPI offers in-depth insights in a unique context which has not been explored thus far in the academic discourse. The insights from this case study and the framework also both challenge and incorporate the widely held beliefs of STS and IR scholars on whether international expertise is capable of influencing global environmental decisions.

Foremost, this paper demonstrates that institutional design can, in some cases, be pivotal in strengthening the influence of expertise in global environmental governance. This is particularly the case for the UNCCD SPI which resembles a “boundary organization” wherein institutional design plays a crucial role in managing the boundary between experts and policymakers (De Donà, 2021).

In our case study, the mandate is the main component of the institutional design, making it an enabler for expertise to matter in UNCCD decisions. However, there are mixed views regarding the rigidity of the SPI mandate, with some considering a rigid mandate beneficial for preserving scientific integrity, and others arguing that it limits the agenda-setting power of experts and prevents the exploration of important topics. Regardless, we found that agency is facilitated by an enabling structural context, i.e., the mandate, with stakeholders of the SPI specifying the rules and procedures that make this mandate crucial in elevating the role of the SPI in the UNCCD.

However, our results indicate that an institutional design, like a mandate, is not sufficient to determine political outcomes. Rather, the often uneven boundary work between member states and experts can significantly constrain, as well as enhance, the role of expertise in global environmental decisions. With some member states providing limited support or manipulating the language of SPI reports to, supposedly, fit their agenda, creating tension and delays in the advisory process, we can deduce that political actors have ultimate control over the capacity and influence of the SPI. Although the mandate is somewhat flexible, member states are wary of giving experts “too much” agency or power in negotiations, actively maintaining the dependence of the SPI on the UNCCD COP. This finding is aligned with previous research on the UNCCD SPI that highlights past instances of member states advising against the establishment of the SPI to “avoid redundancy and additional costs” (Laurens, 2023).

As a result, scientific advice continues to have a difficult time influencing policy implementation and political will. These findings lend credence to claims made by scholars like Grundmann and Rödder (2019), who argue that science and policy belong to different spheres and that, while science is important for policymaking, the political side will always be the ultimate arbiter in global environmental governance. As we found in our case study, the provision of scientific advice is not followed by political accountability, which in global environmental governance may take at best the form of “naming and shaming”. Since implementation is left at the discretion of countries, the orchestrators—whether scientific bodies, international organizations, or secretariats—cannot “impose” any actions upon them. This contributes to the extensive pressure of political bodies on expert groups, like the UNCCD SPI, to avoid being “too” policy prescriptive and to rather remain distant from the political sphere. This is in line with the arguments made by Hickmann (2014) about the influence of epistemic communities being merely limited to the agenda-setting phase of the policy cycle. From this, we deduce that the presence of innovative and favorable institutional design conditions are hardly sufficient for expertise to play a groundbreaking impact on global environmental policymaking.

While our evidence points to member states maintaining control of the SPI, we acknowledge that this is not necessarily due to a “hidden” agenda. There may be instances when a member state requests changes to outputs as a way to “dilute” policy recommendations, but there may also be cases when member states amend SPI outputs in a way that ensures more equitable outcomes, meeting the needs of marginalized groups. Prior studies noted that, despite the progress of co-production processes becoming

more inclusive, some experts crafting usable knowledge continue to pay minimal attention to power dynamics and diverse interests (Turnhout et al., 2020; Dilling et al., 2021; Jagannathan et al., 2023). We did not explicitly identify this in this study, but we do not deny the risk of this occurring in the SPI and that member states could potentially mitigate this risk.

Regardless of the evident “tight leash” member states hold on science in major political conventions like the UNCCD, our findings complement existing evidence of tangible impacts the SPI has made in UNCCD decisions. We conceive of these impacts as the result of “windows of opportunity” enabled by the institutional design of the SPI, particularly through its inclusive membership consisting of policymakers, independent experts, and observers. Interviewees noted that by being mandated to include diverse stakeholders in its processes, the SPI not only facilitated the integration of a broad range of perspectives, but, more importantly, allowed for frequent two-way dialogue between scientists and policymakers.

The proximity of scientists and policymakers is a topic of ongoing debate, where one side of the discourse argues for the integration of science and policy and the other advocates for a clear cut boundary where science and policy operate separately. STS scholars are often situated in the former side of the discourse, claiming that increased proximity of and strengthened interactions between scientists and policymakers in a hybrid body facilitates the relevance and political robustness of the policy recommendations formulated by the SPI (Sundqvist et al., 2015; Akhtar-Schuster et al., 2016; Thoni and Livingston, 2021; De Donà and Linke, 2023). This is complemented by a joint, hybrid management of boundary organizations from both communities of actors, exemplified in our case of the UNCCD SPI. De Donà (2021, p. 87) also applied the concept of hybrid management, coined by Miller (2001), on the UNCCD SPI. He concluded that the SPI is “eclectic and nimble” through the deployment of multiple, diverse strategies that integrate scientific and political elements of an organization, while also remaining flexible when a strategy is unsuccessful.

Conversely, IR scholars are usually on the opposing side of the argument, advocating for drawing a strict boundary between science and policy to protect epistemic authority of expertise from potential politicization. Thus, they align themselves with a linear conceptualization of science-policy interplay (De Donà and Linke, 2023).

To address the trade-offs of being “too close”, many scholars propose a “separation and integration” balance, asserting that expert groups should strive to preserve scientific autonomy during knowledge production and integrate science and policy during knowledge synthesis and reporting (Humphreys, 2009; Sundqvist et al., 2015; Akhtar-Schuster et al., 2016, p. 170; Andresen et al., 2018). In the unique case of the UNCCD SPI, experts and policymakers were also integrated in the development and regular reform of the mandate. This made the SPI a rare example of an advisory group striving for this balance by designing institutional arrangements in a way that grants experts the agency to work closely together with policymakers, while also retaining autonomy when writing advisory reports.

The advantages of a closer collaboration with the UNCCD secretariat and member states suggest that granting the SPI an

independent, legal status, similar to the IPCC and IPBES, may not be an ideal approach. This is because it could potentially result in expertise becoming excessively detached from policy, as highlighted in the study by [De Donà and Linke \(2023\)](#). However, we acknowledge that while the IPCC and IPBES are independent from their associated Rio conventions, they continue to have strong impacts on global environmental policies through a scientific assessment process and, particularly, the development of a summary for policymakers, in which both intergovernmental expert groups are highly influenced by the policy side. Additionally, with the IPCC and IPBES generating assessments which are, by design, not policy-prescriptive, and covering the issues of biodiversity loss and climate change more comprehensively, they have a broader reach in their influence and audience. This contrasts with the UNCCD SPI in its institutional design of being firmly embodied in the UNCCD mechanism and, therefore, mandated to “translate relevant scientific findings and recommendations... into proposals to be considered by the CST for the consideration of the COP” ([UNCCD Secretariat, 2017](#)). This results in a different type of output, typically topic-specific assessments almost exclusively catered to a policy audience.

Although institutional independence of the SPI from the UNCCD may garner benefits as it did for the IPCC and IPBES, in giving experts more freedom in defining their work programs, as well as potentially addressing the capacity gap of the SPI, there is a risk that the SPI will not maintain relevance to policymakers. Nevertheless, we recognize that the SPI remaining within the confines of the UNCCD under a constrained mandate would limit its influence beyond the Convention, making SPI outcomes unusable to a larger variety of audiences within the global environmental governance sphere.

Through the institutional design, experts have become “agents of change”: in fact, despite its somewhat uncomfortable position, expertise manages in some instances to “get its space”. This is also evidenced in the numerous positive outcomes of the SPI since its inception, as documented by [Akhtar-Schuster et al. \(2022\)](#). For a small expert group with limited access to financial resources, this is a considerable achievement, demonstrating that the SPI has been successful in influencing the policy agenda, notwithstanding its mandate strictly tied to the COP.

However, this influence remains limited due to the immense difficulty among experts and political actors in identifying and seizing “windows of opportunity” in global environmental governance, and decision arenas, in general. The emergence of these contextual “policy windows” crucially depend on different factors, such as, budget and election cycles ([Kwak, 2017](#)). Thus, the case demonstrates that international expertise for sustainable development can only take advantage of the rare “windows of opportunity” that intergovernmental processes concede to both scientific and political actors. Yet, our case also demonstrates how experts can leverage “windows of opportunity” to inform policy by utilizing particular aspects of the institutional design to circumvent barriers imposed by boundary work dynamics.

Based on all of the above, we reject quasi-epiphenomenal, neorealist treatments of expertise. In fact, it should not be excluded that new scientific knowledge may lead to reorient one’s political interests or to realign the positioning of relevant political actors. In this respect, [Wagner et al. \(2023\)](#) emphasize that

science-policy interfaces are crucial in promoting social learning among policymakers, which is necessary for policy formulation. However, assuming that science and expertise alone can be the decisive factor goes against the logic of state sovereignty regulating the UN. While new information may contribute to unsettle the domestic black box of some states, others may continue to make decisions that unwaveringly follow predetermined paths.

In light of our analysis and the above considerations, we can assert that, if certain enabling conditions such as a favorable institutional design are in place, expertise can indeed matter in global environmental politics. However, since its scope is severely constrained, the overall impact of expert advice should not be overestimated.

Conclusion

In this paper we investigated how scientific expertise matters in global environmental governance by developing a theoretical model combining views from STS and IR and applying it to a single case of the UNCCD SPI. Through semi-structured interviews with stakeholders of the SPI and observations of the interactions between experts and policymakers, we identified key contextual factors related to the institutional design on top of boundary work driving the documented influence of the SPI on UNCCD decisions. Overall, by highlighting how context mostly enables, but can also hinder expertise to matter, the UNCCD SPI is a paradigmatic case in its metaphorical role. In short, the case is an exemplar of the theoretical framework we developed that hybridizes the diverse ontological perspectives of IR and STS on expertise influencing global environmental governance.

A significant finding from this study is that experts often need to be held “on a leash” by member states if their inputs are to be seriously considered by policymakers. But as long as this leash is “loosened” through a flexible and inclusive mandate will experts have more of a voice in decisions, going beyond simply meeting the knowledge needs of policy. Thus, the mandate—our hypothetical “leash”—is crucial in enhancing the policy relevance of advisory outputs. As our case illustrated, it secures the SPI in its important and influential role in UNCCD decisions. The mandate simultaneously facilitates conditions for expertise to seize windows of opportunity to provide policy-relevant knowledge outside the scope of member states’ direct demands, without prejudice to their actual and specific needs to actively reduce land degradation and restore land preventing further desertification.

Our study highlights the need for more research on the institutional design and its specific components, like the mandate, as crucial ingredients for expertise to matter in global environmental governance. Future research can use our framework but adapt it accordingly, paying special attention to the unique contextual factors which either enable or hinder expertise to matter in policymaking. Additionally, selecting examples of different contexts and conditions that match with the differing degrees of importance that STS and IR scholars attribute to expertise in global environmental governance would be beneficial. This can help in identifying strategies to overcome challenges and grasp opportunities to (re)design institutions for global expert groups to more effectively meet their objectives. Moreover, research on other

important contextual factors and dynamics besides institutional design and boundary work is needed.

Through our study and our theoretical framework, we showed that the complexity of science-policy dynamics deserve in-depth understanding of peculiar contexts, which poses challenges to generalizations regarding questions on whether expertise matters or not. While a case such as the UNCCD SPI can offer valuable insights to scholars and practitioners on how institutional design can effectively empower expertise in policymaking, its situatedness should invite caution with regard to broad applicability.

The different, often contradictory, arguments pushed by IR and STS scholars on the importance of expertise in policymaking all have merit. However, none of them provide a “one-size-fits-all” solution nor an answer for the question whether international expertise matters in global environmental governance. While there is no panacea for the challenges experts face in having their voices heard in political settings, our paper demonstrates that, through institutional design and boundary work, there are measures SPIs can take to seize windows of opportunity to bridge the knowledge-action gap on global environmental problems.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Ethics statement

The studies involving humans were approved by the ZEF Research Ethics Committee, at the Center for Development Research (ZEF) of the University of Bonn. The studies were conducted in accordance with the local legislation and institutional requirements. The participants provided their written informed consent to participate in this study.

Author contributions

SV: Conceptualization, Formal analysis, Investigation, Methodology, Project administration, Writing – original draft,

Writing – review & editing. MD: Conceptualization, Investigation, Methodology, Project administration, Writing – original draft, Writing – review & editing.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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