

Sarker, Pradip Kumar et al.

**Article — Published Version**

The forest policy outputs of regional regimes: a qualitative comparative analysis on the effects of formalization, hegemony and issue-focus around the globe

International Environmental Agreements: Politics, Law and Economics

**Provided in Cooperation with:**

Springer Nature

*Suggested Citation:* Sarker, Pradip Kumar et al. (2024) : The forest policy outputs of regional regimes: a qualitative comparative analysis on the effects of formalization, hegemony and issue-focus around the globe, International Environmental Agreements: Politics, Law and Economics, ISSN 1573-1553, Springer Netherlands, Dordrecht, Vol. 24, Iss. 2, pp. 449-467, <https://doi.org/10.1007/s10784-024-09641-1>

This Version is available at:

<https://hdl.handle.net/10419/315305>

**Standard-Nutzungsbedingungen:**

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

**Terms of use:**

*Documents in EconStor may be saved and copied for your personal and scholarly purposes.*

*You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.*

*If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.*



<http://creativecommons.org/licenses/by/4.0/>



# The forest policy outputs of regional regimes: a qualitative comparative analysis on the effects of formalization, hegemony and issue-focus around the globe

Pradip Kumar Sarker<sup>1,2,3</sup> · Lukas Giessen<sup>3</sup> · Max Göhrs<sup>2</sup> · Sohui Jeon<sup>4</sup> · Minette Nago<sup>2</sup> · Fredy David Polo-Villanueva<sup>3</sup> · Sarah Lilian Burns<sup>3,5,6</sup>

Accepted: 6 May 2024 / Published online: 1 June 2024  
© The Author(s) 2024, corrected publication 2024

## Abstract

International regimes, defined as sets of norms and rules around which members' expectations converge, are providing structures for facilitating cooperation in a given issue area. Two main lines of environmental regime scholarship prevailed thus far: one on structural design aspects of international institutions and one on their effects and effectiveness. However, questions on how such effects are achieved in detail largely remain unanswered. Against this background, this study aims to analyze the institutional design conditions under which regional regimes produce strong or weak policies. We do so by qualitatively comparing, using a fuzzy-set Qualitative Comparative Analysis (fsQCA), nine regional regimes across the world towards their ability of producing regime forest policies as an illustrative issue area. Three structural conditions were identified as being influential on regime policy: (i) The degree of formalization (ii) The existence of hegemonic/powerful member state(s) and (iii) Scope or issue specificity bearing the identity of a regime. Our results showed that no one condition on its own was necessary to produce either strong or weak regime forest policy. However, all three conditions, through three different configurations, created a robust pathway for producing strong regime policy. In addition, the combination that showed the presence of all three conditions was related to weak regime policy. These results open several prospects for future research on the relationship between regimes' structures and regime policy.

**Keywords** QCA · Regional regimes on forests · Institutional design · Regime structure · Regime policy · Forest policy

## Abbreviations

QCA	Qualitative Comparative Analysis
IFRC	International Forest Regime Complex
ACTO	Amazon Cooperation Treaty Organization
ASEAN	Association of Southeast Asian Nations
COMIFAC	Commission of Central African Forest

EU	European Union
FE	Forest Europe
MERCOSUR	Southern Common Market
MP	Montreal Process
SAARC	South Asian Association for Regional Cooperation
SACEP	South Asia Cooperative Environment Programme
FOR	Formalization
HEG	Hegemony
ISS	Issue specificity
PSTR	Policy strength
GDP	Gross Domestic Product

## 1 Introduction

Over the past three decades, a large number of international agreements and regimes emerged for addressing a range of global environmental issues, such as deforestation, climate change and biodiversity loss (Levy et al., 1995; Young, 1999; Zelli et al., 2020; Arts, 2021). These international regimes, classically understood as sets of norms and rules around which members' expectations converge, are providing structures for facilitating cooperation in a given issue area, formally claiming to identify problems of international concern and to formulate goal-oriented contributions for addressing these problems (Krasner, 1983, Giessen forthcoming). However, different regimes have shown different levels of effectiveness in achieving **effects** on global issues in domestic settings and physical conditions on the ground (Young, 1999; Begemann et al., 2021). Two main lines of global environmental regime scholarship prevailed thus far: one on **structural design** aspects of international institutions (Koremenos et al., 2001a, b; Debre & Dijkstra, 2021; Vabulas & Snidal, 2021) and one on their **effects** and effectiveness (Young, 1999; Underdal & Young, 2004; Gutner & Thompson, 2010; Lall, 2017).

Firstly, **regime structures and design**, understood as the ways in which environmental issues are addressed and the features along which such international structures are developed through regimes, greatly vary (Koremenos et al., 2001a; Debre & Dijkstra, 2021). Institutional design features such as membership rules, scope of issues covered, centralization of tasks, rules for controlling the institution, and flexibility of arrangements are found to provide key insights into regime structures. This also includes the scales, from global to regional to bilateral, at which regimes address an issue. Secondly, the majority of international environmental regimes try to achieve **effects** in domestic settings and physical conditions on the ground. Research on regime effectiveness has shown which types of effects could be achieved by which type of regime (Lall, 2017; Zelli et al., 2020; Arts, 2021).

After findings on the stark limitations of some global environmental regimes (e.g. Biermann & Pattberg, 2012), scholarship under new regionalism (Hettne, 2005) increasingly turned its attention towards regional regimes (Acharya, 2014; Balsiger & Prys, 2016; Sarker et al., 2019). The regional turn is inherently linked with design questions of international regimes. Since regional institutions are closer to the underlying problem structures, questions of regime scope can be addressed based on a common problem structure of concerned members including, regional powers, as potential hegemon and drivers of regime forma-

tion. By moving the focus from global international regimes towards regional regimes, this article focuses on the plans of action negotiated within regional regime structures, eventually paving the way or even leading to specific consequences (Giessen forthcoming). It is this theoretical aspect of what we conceptualize as a regime's policy, which this article aims to explain by analyzing how regional regimes are developing capacities and plans of action to facilitate actions on an issue they address. For this, we propose a dual lens for looking at such policy capacities of international regimes (Giessen & Sahide, 2017, Giessen forthcoming). This includes (i) the regime's *institutional design* as well as (ii) the issue-specific *policy* developed within that very regime. This conceptual distinction between regime structure and more advocacy-oriented regime policy allows addressing the question of which institutional design conditions lead to stronger or weaker regime policies.

Empirically, questions about the effects of international regimes resonate well in the field of international land-use governance and its domestic consequences, mainly split into scholarship on individual land uses, such as *forests* (Humphreys, 2006, 2015; Arts, 2021), *environment* (Biermann & Pattberg, 2012; Zelli et al., 2020), and *agriculture* (Sikor et al., 2013). Most land uses, at least in spatial terms, relate to questions of maintaining, removing, or rebuilding forests (Giessen forthcoming). Thus, inquiry into the wide array of international regimes aiming to govern forests may provide for insightful results on international land-use governance. Forests have become an important issue in international relations mainly since the Earth Summit in Rio in 1992 (Humphreys, 2006). Since then, a growing number of international policies and regimes aimed at global forest governance evolved into what can be described as an international forest regime complex (IFRC) (Humphreys, 2006, 2015; Rodríguez Fernández-Blanco et al., 2019). Looking at the IFRC is particularly insightful, because of the exceptionally high abundance of various international regimes addressing forests in multiple ways and the resulting fragmentation of the regime complex (Rodríguez Fernández-Blanco et al., 2019). Within the IFRC, regional forest regimes, empirically as well as analytically, are gaining strong momentum in land use politics (Bezerra et al., 2018; Sarker et al., 2019), making it an interesting case to compare regional regimes towards their ability of producing forest policies as an illustrative issue area.

Against this background, this study aims to analyze the institutional design conditions under which regional regimes produce strong or weak policies. We do so by qualitatively comparing a medium number of regional regimes towards their ability of producing regime forest policies.

## 2 Theoretical framework

Regional regimes can be defined as international arrangements between two or more actors from different countries, with limiting criteria for membership based on spatial or other crucial functional proximity, and with a lack of global aspirations (Giessen & Sahide, 2017; Sarker et al., 2019 based on Krasner, 1983). International Relations literature suggests that specific aspects of the institutional design of regimes, i.e., the underlying structure that determines the level of institutionalization (Krasner, 1983; Levy et al., 1995; Debre & Dijkstra, 2021), can have an impact on the regime policies (Koremenos et al., 2001a; Biermann & Siebenhüner, 2009; Dimitrov, 2020). Three structural conditions have been primarily identified as being influential on regime policy: (i) The degree of formalization (e.g., Levy

et al., 1995, Hasenclever et al., 1996); (ii) The existence of hegemonic/powerful member state(s) or power distribution (e.g., Hasenclever et al., 1996, Schulz & Levick, 2021), and (iii) Scope or issue specificity bearing the identity of a regime (e.g., Levy et al., 1995; Koremenos et al., 2001a).

Against this background, we theorize that the institutional design of regimes could affect their outcomes, defined as regimes' policies.

The theoretical expectations for each of these three conditions and the outcome are described in the following subsections.

## 2.1 Outcome: strong or weak regime forest policy

Regime policies can be defined as relatively stable (long-term) technical plans and courses of action (or non-action) developed by member states towards a particular issue, such as forests, agriculture, trade or environment, in the name of cooperation (Sarker et al., 2019, Giessen forthcoming). These policies consist of goals, instruments and a precise setting of these instruments (Hall, 1993). Policy goals can be defined as wide-ranging explicit objectives, intentions or purposes that govern for policy development, (e.g. reduce deforestation and forest degradation) (Humphreys, 2006; Howlett et al., 2015). The formulation of solutions for achieving these goals requires the use of specific tools or policy instruments by which the regimes aim to change an actor's behavior (Howlett et al., 2015). Hence, policy instruments can be defined as techniques of governance used in order to achieve desired policy ambitions (Howlett et al., 2015). Based on the resources mobilized, the different policy instruments can be classified into regulatory, economic and fiscal, incentives, information and best practice standards, each involving different types of political relations and legitimacy (Krott, 2005; Lascoumes & Le Gales, 2007). The choice among this set of policy instruments can be as contentious as the choice of policy itself (Howlett et al., 2015).

Building on Hall (1993), the strength of regime's policies can be assessed through three dimensions: (1) the degree of coherence of goal orientation; (2) the consistency of means with goals; and (3) the level of financial and institutional backing (Krott, 2005). This definition of policy strength employed in this study, however, is a mere measure of policy design and it does not preclude or inform about the impacts a policy might have on the ground.

2.1.1. Goal coherence can be defined as the harmony of the different goals that guide policy in a specific field, to one another or to an overarching purpose (Zelli et al., 2020). According to this definition, coherent goals are non-conflicting with each other and can be achieved simultaneously without significant trade-offs, although they do not necessarily reinforce each other (Howlett & Rayner, 2010). Contrary, goals are incoherent when they are contradictory (e.g. simultaneously promoting in situ biodiversity conservation and the conversion of natural forests to other uses) such that the implementation of the policy can lead to the attainment of only some or none of its goals (Rodríguez Fernández-Blanco et al., 2019).

2.1.2. Consistency of means can be defined as concrete policy instruments working together to support at least one policy goal, free from contradictions or conflicts and establishing actual synergies within a combination of several policy instruments (Howlett & Rayner, 2010). Contrary, means are inconsistent when they work against each other and are counter-productive (Howlett & Rayner, 2010).

2.1.3 The level of financial and institutional backing refers to the precise settings of the policy instruments and is linked to what has been described as policy capacity (Hall, 1993). The resources available, including financial and human capital, for each policy instrument can have significant implications on the capacity to achieve the policy goals (Hall, 1993).

## 2.2 Condition 1: the degree of regime formalization

Different institutional aspects of the regimes, related to decision-making procedures, have been described as important in explaining the development of regime policy (Levy et al., 1995; Koremenos et al., 2001a, b; Vabulas & Snidal, 2021). Among them are the degree of institutionalization, voting systems and the secretariat's role in decision-making (Levy et al., 1995; Koremenos et al., 2001a). Differences in all these aspects result in different levels of formalization. Regimes are then defined as formal when two or more states "under a legalized agreement hold regular meetings organized through an independent institutional arrangement such as a secretariat" (Vabulas & Snidal, 2021, p. 861). The legal obligations agreed by the member states with the ratification of the underlying treaties can prescribe, proscribe and/or authorize behavior, at the cost of long negotiation processes (Koremenos et al., 2001a). Contrary, informal settings are based on soft law, including "Memoranda of Understanding" or "Declarations" to clarify shared expectations without creating legal obligations (Abbott & Snidal, 2000; Vabulas & Snidal, 2021).

Based on the voting arrangements some states may carry considerably more weight than others (Koremenos et al., 2001a). While in majority voting no state can block decisions, systems requiring consensus are more likely to face veto players and gridlocks (Lall, 2017; Debre & Dijkstra, 2021).

Last, the regimes' bureaucracies or secretariats, can have important roles in contributing to their organizations' performance, with significant variations in their functions and capacities (Guntner and Thompson 2010, Debre & Dijkstra, 2021). While some organizational arrangements can be achieved by engaging a member state to provide administrative functions, this does not qualify as a secretariat (Vabulas & Snidal, 2021). Secretariats, although having agency of their own, might still be dependent on the funding and political support of their member states, limiting their policy-making capacity (Guntner and Thompson 2010, Lall, 2017, Gray, 2018).

Given this background, we hypothesize that the degree of formalization of regional regimes has an effect on the strength of the regime policies. Specifically,

**H1** The higher the levels of formalization of regional regimes the more it is likely that they will lead to strong regime forest policy.

**H0** The higher the levels of formalization of regional regimes the more it is likely that they will lead to bureaucratization and hence weaker forest policy.

## 2.3 Condition 2: powerful members and hegemony

The power of actors involved in addressing a particular issue and the power distribution among regime members, has been described as an important factor influencing regime out-

comes (Koremenos et al., 2001b; Mitchell & Keilbach, 2001; Westerwinter et al., 2021). Power can be defined as the “probability that one actor within a social relationship will be in a position to carry out one’s own will despite resistance” (Weber 1922, 152). As a result of power asymmetries not all member states have the same influence in determining the regimes’ design and outcomes (Snidal, 1985; Young, 1991; Schulz & Levick, 2021). Based on the hegemonic-stability theory, regimes are established and maintained by states that hold a preponderance of power capabilities, defined as hegemons. Hegemony can be observed in cases where the power asymmetries are such that one single state can exercise a strong bargaining leverage with clear guidance towards strong regime policy supporting the hegemon’s interests (Young, 1991). Power asymmetries can also be observed in cases with an oligopolistic group of states, where two or more member states possess substantial capabilities, not necessarily equal, that allow them to make use of their bargaining advantage towards mutually acceptable regime policies (Snidal, 1985; Young, 1991, Hasenclever et al. 1996). At the other end of the spectrum, when power becomes more equally distributed among the member states, regimes tend to decrease in strength or effectiveness (Snidal, 1985; Young, 1991; Hasenclever et al., 1996; Keohane & Nye, 2012).

Although traditionally the power resources of a country have been linked to military aspects of national security, power is no longer linked to military resources but rather to the economic strength and global political influence (Keohane & Nye, 2012). Hence, these capabilities include the general development of the economy (e.g. large economies measured by GDP) and can also be related to the resources provided by each member state to the regime.

Against this background, we hypothesize that the distribution of power among the member states has an effect on the strength of the regime policies. Specifically,

**H2** If hegemonic structures are present within a regional regime, then strong regime forest policy is more likely.

**H0** If hegemonic structures aiming to obstruct regime effectiveness are present within a regional regime, then weak regime forest policy is more likely.

## 2.4 Condition 3: issue focus of regimes

Another important feature of regimes is the type and scope of issues covered associated with the type of actors involved, in what can be described as the problem structure (Levy et al., 1995). Regimes with a narrow scope pool the most relevant actors and issue-specific resources (e.g. financial, information), and hence might be expected to achieve their goals and develop strong policy (Debre & Dijkstra, 2021). In these cases, the specific issues are deeply entrenched into the regime’s overall goals and structures defined by the regime design. Contrary, general-purpose regimes may just shift policy priorities, generating new opportunities for resolving conflicts and reaching mutually beneficial arrangements based on the heterogeneous interests of the member states (Koremenos et al., 2001a; Debre & Dijkstra, 2021).

Based on the importance of a specific issue, regimes can be classified into issue-focused when the issue is the main and only issue covered by the regime and issue-related when the

issue is among the issues covered by the regime but not the only one. Additionally, some regimes might be issue-relevant, when they do not explicitly cover the issue but their decisions are relevant for the issue governance (Giessen forthcoming).

Against this background we hypothesize:

**H3** The more forest-focused regional regimes are, the more it is likely that they lead to strong regime forest policy.

**H0** The more forest-focused regional regimes are, they are more likely to become isolated in the broader regime landscape and hence they are more likely to produce weak forest policy.

### 3 Methods and materials

#### 3.1 Fuzzy-set qualitative comparative analysis

To identify institutional design conditions that affect the regime's policies, this study employs a fuzzy-set Qualitative Comparative Analysis (fsQCA). QCA is a set-theoretic method, based on Boolean algebra, designed for systematic comparisons and causal interpretations of a small and medium number of cases, usually between 5 and 100 (Ragin, 1987; Brockhaus et al., 2015; Wiederkehr et al., 2022). As a comparative case-oriented research technique, QCA combines quantitative information with a case-oriented approach, where good knowledge of each case is needed to explain the link between theory, the cases and the findings, bringing together the strengths of qualitative case-oriented and quantitative variable-oriented approaches (Manuamorn et al., 2020; Ide & Mello, 2022; Wiederkehr et al., 2022). In contrast with conventional statistical methods, such as regressions, which estimate the average effects of independent variables, QCA analyses the specific conditions under which outcomes of interest occur. In QCA "causal relations are represented as subset or superset relations" used for the identification of necessary and sufficient conditions (Wiederkehr et al., 2022, p. 3). Necessary conditions are defined as those in which the outcome does not occur in the absence of such condition (a subset of the condition). The presence of sufficient conditions implies that the outcome occurs whenever the condition is present (a superset of the condition) (Ide & Mello, 2022; Wiederkehr et al., 2022; van der Zon et al., 2023). By expressing causal relations, QCA accounts for causal complexity, including *equifinality* (multiple pathways leading towards an outcome), *conjunctural causation* (combination of conditions can be together necessary and/or sufficient while independently on their own they can be neither necessary nor sufficient for an outcome), and *causal asymmetry* (outcome and non-outcome might require different explanations) (Mello, 2021).

Within the broader QCA methodology, fuzzy-sets analysis is especially powerful as it allows assessing the varying degrees of membership in a well-defined set, between inclusion and full exclusion (Ragin, 2008). QCA is suited for our analysis because it focuses on assessing the effect of different conditions, independently or together in a configuration, on the outcome (Manuamorn et al., 2020; Ide et al., 2021). This analysis involves two parameters of fit that measure the strength of the empirical support for set-theoretic relationships



of necessity and sufficiency: (1) *Consistency* assesses the degree to which cases that share a specific combination of conditions (configurations) also show the outcome of interest; (2) *Coverage* indicates how much of the outcome can be explained by the conditions, i.e. how relevant the conditions or the conjunctions of conditions are for the outcome indicating the relation in size of the overlap between the condition set and the outcome set (Ragin, 2008; Schneider & Wagemann, 2012; Ide & Mello, 2022). While the consistency threshold for sufficiency is suggested between 0.7 and 0.8, the threshold for necessary conditions is higher, above 0.9 (Ragin, 2008; Schneider & Wagemann, 2012). However, the interpretation of any set-theoretic relation as either necessary or sufficient must be built on a solid foundation of theoretical and substantive knowledge (Ragin, 2008). These measures of fit in QCA represent the equivalent to significance and strength in statistical analysis (Ragin, 2008; Mello, 2021).

### 3.2 Case selection

Our case selection includes nine regional forest regimes located in diverse environmental zones globally (Fig. 1) based on a most different systems design, ensuring global coverage of world regions with different forest importance, ranging from forest focused to forest relevant regimes (Jeon et al., 2019, Giessen forthcoming), different degrees of formality, and with different power distribution between member states. Regimes were selected based on data access following political ethnography desiderates. Since QCA does not establish causal mechanisms, although the configurations suggest causal relationships (Arts & De Koning, 2017; Ide et al., 2021), qualitative case studies were performed for each selected

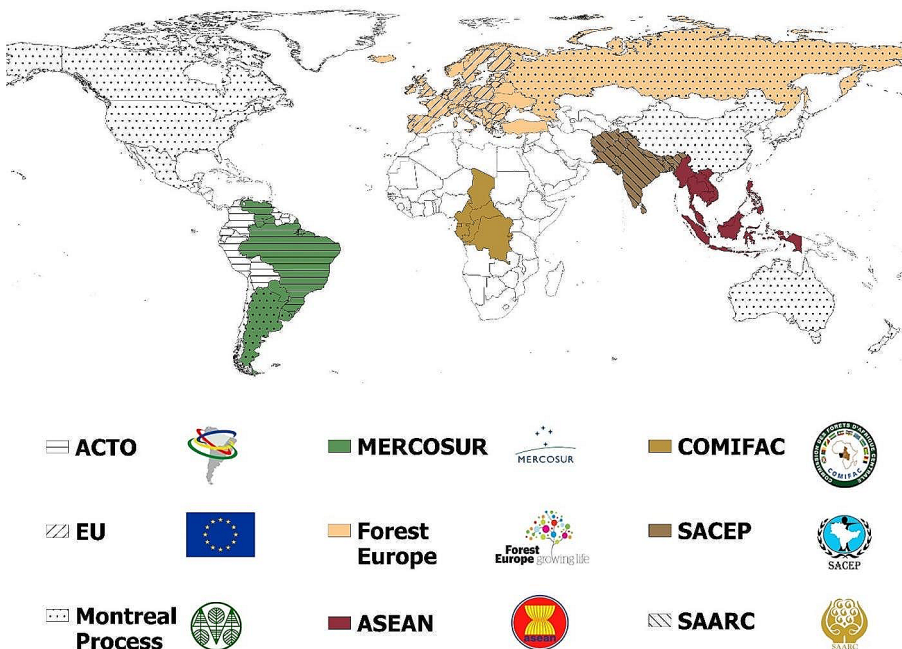


Fig. 1 Geographical coverage of the selected cases

regional regime (Sarker et al., 2018, 2019; Jeon et al., 2019; Nago, 2021; Sarker, 2021; Polo-Villanueva et al., unpublished). While nine cases are generally considered a small-N for QCA, systematic cross-case analysis does not require large samples of cases since cases are especially relevant from a policy perspective (Ragin, 1987, 2008).

### 3.3 Operationalization and calibration

A preliminary long list of factors and their indicators with assessable sub-indicators was reviewed and reduced through a consultative process based on feedback from data contributors resulting in a questionnaire to assess the three defined conditions and the outcome. The number of conditions was low, following the suggested ratio between the numbers of conditions and the number of cases (Ide et al., 2021).

#### 3.3.1 Outcome

Data for the outcome, defined as the strength of the regimes' policies, was collected from the latest environmental conventions, strategic plans of action or conceptual frameworks (here treated as regime forest policy) together with all the forest related instruments (e.g. projects, publication, declarations, action plans). In order to make cases comparable a time frame was selected, between the years 2010–2019. The identified policies were: the ACTO-Amazonian Strategic Cooperation Agenda 2010, ASEAN-Strategic Plan of Action for Cooperation on Forestry (2016–2025), MP-Strategic Action Plan (2009–2015), SAARC-Environmental Convention 2010, EU-A new EU Forest Strategy: for forests and the forest-based sector 2013, FE-Work Program 2015, COMIFAC-Convergence Plan (2015–2025), MERCOSUR-EU Free Trade Agreement 2019 respectively. Using content analysis the data was categorized across the three dimensions (indicators) defined by Hall (1993): coherence of policy goals, consistency of policy instruments and specific setting of the policy instruments. A mean value of the three sub-indicators was finally calculated to define the outcome (Table 1).

**Table 1** Data set for conditions and outcome of Fuzzy-set membership

Cases	Conditions			PSTR (Policy Strength)
	FOR (Formalization)	HEG (Hegemony)	ISS (Issue specificity)	
<b>ACTO</b>	1	1	0.67	0.33
<b>ASEAN</b>	1	0.33	0.67	1
<b>COMIFAC</b>	1	0.67	0.67	0.33
<b>EU</b>	1	0.33	0.33	0.67
<b>FE</b>	0.33	0.33	1	1
<b>MERCOSUR</b>	1	1	0.33	1
<b>MP</b>	0.33	0.67	1	1
<b>SAARC</b>	1	1	0.67	0
<b>SACEP</b>	1	1	0.67	0

Here, 1=membership fully in, i.e., the regime case fully meets the high levels of requirements for FOR, GHEG, ISS, and PSTR; 0.67=more a member than a non-member; 0.33=more a non-member than a member; 0=non-member.

### 3.3.2 Conditions

Data for condition 1 on formalization was obtained from the founding documents as well as other official documents issued by the regimes, including the charter/constitution, agreements, declarations, statements, decisions and resolutions, since the legitimacy of the selected regional regimes. Online-based repositories of all regional regimes were thoroughly examined, together with documents and data from reputable development partners (e.g., World Bank, Food and Agriculture Organization). Qualitative content analysis was applied in order to identify the five indicators defined including the presence of a legally binding agreement or treaty, the decision-making system and three indicators related to the presence and characteristics of the secretariat.

The condition 2 on hegemony was based on two indicators. The first indicator was calculated based on the GDP distribution between the member states of the regime, using the database from the World Bank (World Bank 2020). The second indicator was calculated based on the core funding of the regimes, whether based on GDP formulas, equal funding by the member states or in kind contribution of some particular states.

Data for the condition 3 on issue specificity came from the founding documents on the regimes and the formal goals.

### 3.3.3 Fuzzy-set data calibration

For each case, we calibrated the raw data for the three conditions and the outcome in order to obtain the fsQCA scores or membership scores applying well-informed four-value calibration membership scores (0; 0.33; 0.67; and 1.0), following Ragin (2008). After the calibration process, and in order to determine which configurations are linked to the positive outcome, an analysis of sufficiency was performed. This analysis produces three types of solutions: conservative, intermediate and parsimonious (Manuamorn et al., 2020; Ide & Mello, 2022). While the conservative minimization is only based on the truth table rows with empirical observations, the intermediate minimization draws on all empirically observed truth table rows plus the logical remainders that contribute to the parsimony of the solution and can be assumed to produce the outcome (here: strong policy). The parsimonious minimization is based on all empirical observed truth table rows as well as all logical remainders that contribute to the parsimony of the solution (Schneider & Wagemann, 2012). These logical minimizations facilitate the inspection of the entire truth table seeking to identify simpler combinations of causal conditions for which an outcome is true. The results of these minimizations are called “solution formulas” following the so-called Quine-McCluskey algorithm (Ragin, 1987). These solution formulas are a powerful tool to succinctly express fairly complex relationships among conditions and an outcome, and one of the best approaches for presenting the result of QCA/fsQCA (Ragin, 1987). Tosmana software (Lasse, 2019) and the software developed by Ragin and Davey (2016) were used for getting necessary conditions or combinations of conditions with deciding consistency and coverage thresholds of 0.90 and 0.50 respectively, and a consistency threshold of 0.75 for analyzing sufficiency.

## 4 Results

As a first step, the presence of necessary conditions for the outcome was evaluated by assessing the consistency value (Ragin, 2008). Following Schneider and Wagemann (2012) a condition is considered necessary if the consistency value is 0.9 or higher, indicating the degree to which the presence of a condition overlaps with the outcome and hence showing a potential strength of a causal link between them (Ide et al., 2021). Our results showed no necessary conditions both for a positive or a negative outcome. This means that neither the presence nor the absence of any condition (formalization, hegemony, and issue specificity) are necessary to facilitate either a strong or a weak regime policy. The presence of formalization (0.79) and the presence of forests as an issue (0.78) have the highest consistency values.

In the truth table (Table 2), each row presents information about one of the logically possible combinations among the conditions. Six out of eight potential configurations were empirically observed. Five of the observed combinations indicated the presence of strong policy (policy=1) while only one links to weak policy (policy=0).

Following Thiem and Baumgartner (2016), in this study we draw on the parsimonious solution (Table 3), which the authors describe as most reliable for causal analyses. This solution is characterized by a high consistency value of 0.86, meaning that the claim that these configurations are sufficient for the outcome to occur is supported by empirical evidence (Manuamorn et al., 2020). The coverage score of 0.75 indicates that the solution formula explains 75% of the outcome when it is present. The solution explains the 5 cases where strong regime policy is produced and is absent in the four cases with weak regime policy. The QCA identified three paths of sufficient conditions enabling strong regime policy (Table 3). The first configuration (*~for*) highlights the absence of formalized structures and has the highest consistency score possible (1.0) but a low raw coverage of 0.25 (Table 3). This configuration was observed in two cases, Forest Europe and the Montreal Process. While these regimes lack a formal structure they develop policies based on the provision of empirically deep forest information and related capacities.

The second pathway (*~iss*) identifies regimes with no mandate on forests, as observed in two cases, the EU and Mercosur. This configuration has a lower consistency score (0.78) but a higher raw coverage of 0.44 (Table 3). Despite the lack of a clear mandate on forests,

**Table 2** Result of sufficient conditions or configurations in truth table

Conditions/factors			Consistency	Outcome (Policy strength)	Consistently observed cases	Inconsistently observed cases
FOR	HEG	ISS				
True	False	True	1.00	True	ASEAN	
True	False	False	1.00	True	EU	
False	True	True	1.00	True	MP	
False	False	True	1.00	True	FE	
True	True	False	0.75	True	MERCOSUR	
True	True	True	0.54	False	-	ACTO, COMI-FAC, SAARC, SACEP
False	True	False	n/a	Remainder	-	-
False	False	False	n/a	Remainder	-	-

True=present, False=absent

**Table 3** The parsimonious solution of truth table for strong regime policy  
Consistency and coverage solution for sufficient condition(s)

Term/configuration	Consistency	Raw coverage	Unique coverage	Cases
for+	1.0	0.25	0.06	FE; MP
iss+	0.78	0.44	0.19	EU; MERCOSUR
heg	1.00	0.50	0.06	ASEAN; EU; MP
Solution	0.86	0.75		

Note: In QCA, [+] means [or]; and [\*] means [and]

NB: Solution consistency measures the degree to which membership in the solution (the set of solution terms) is a subset of membership in the outcome (Ragin, 2008)

NB: Solution coverage measures the proportion of memberships in the outcome that is explained by the complete solution (Ibid)

NB: Raw coverage measures the proportion of memberships in the outcome explained by each term of the solution (Ibid)

NB: Unique coverage measures the proportion of memberships in the outcome explained solely by each individual solution term (memberships that are not covered by other solution terms) (Ibid)

**Table 4** The intermediate solution of truth table for weak regime policy

Consistency and coverage solution for sufficient condition(s)			
Term/configuration	Consistency	Coverage	Cases
FOR*HEG*ISS	0.75	0.83	ACTO, COMIFAC, SAARC, SACEP

these two regimes, which have a strong focus on economic issues, developed strong forest policies under the umbrella of trade.

The third pathway ( $\sim$ heg) identifies treaty regimes with no clear hegemonic structures, as observed in three cases, ASEAN, the EU and Forest Europe. These regimes have developed relative strong political strategies to address very specific, targeted and clearly focused forest policies. This configuration has a perfect consistency score (1.0) and a higher raw coverage of 0.5 (Table 3). In order to test the robustness of the results two types of robustness tests were performed: alternative consistency thresholds and alternative sets of cases. Results from these tests are presented in Annex A. All 10 robustness tests provided solutions that were subsets of the solution formula of the main analysis and hence do not contradict it (Ide et al. 2021, Wiederkehr et al., 2022).

Following Dua (2019) we also calculated the intermediate solution which provided a different formula of  $FOR*\sim iss+\sim for*ISS+FOR*\sim heg+\sim heg*ISS$ . However, this solution was not robust in the robustness tests and is, hence, not discussed in the article.

The analysis of sufficient conditions for the absence of the outcome uses the same conditions employed in the previous analysis. The results showed that there is a unique path that sufficiently explains weak forest policy ( $FOR*ISS*HEG$ ) (Table 4). This pathway indicates that formalized regimes with hegemonic structures that formally address forests as an issue lead to weak regime policy. This was observed in four cases, ACTO, COMIFAC, SAARC and SACEP, where, given a clear forest relevance, strong formal regime structures were preferred not to produce strong policy by the hegemon. The consistency (0.75) and overall coverage (0.83) of this solution are high and above the threshold suggested for sufficient conditions (Ragin, 2008; Schneider & Wagemann, 2012), implying that the claim is empiri-

cally supported explaining 83% of the outcome of a weak forest regime policy (Manuamorn et al., 2020).

## 5 Discussion

Our results show that while none of the three conditions analyzed are determinant in the development of strong or weak regime policy, they are all highly relevant for explaining that very policy.

When analyzing **formalization** (condition 1) we find that although it is not a necessary condition, it has a strong explanatory value in the development of regime policy. This is evidenced by the absence of the condition in configuration 1 explaining strong regime policy and also by its presence in configuration 4 that explains weak regime policy. We interpret these findings to support previous claims that regime design is not random but rather follows some specific interests of potentially specific member countries (Koremenos et al., 2001a, b). These interests, however, may not only support the development of a strong regime policy, but might at times also imply the opposite outcome, i.e. weak policy, as previously suggested by Dimitrov (2003, 2020) and Gray (2018). Contrary to our hypothesis (H1), the presence of formalization in configuration 4 indicates that high levels of formalization of regional regimes not necessarily lead to strong regime forest policy. This was observed in the cases of ACTO, SAARC, SACEP and COMIFAC, where formal regime structures leading to bureaucratization were preferred not to produce strong forest policy, following the interests of powerful member states such as Brazil and India. In the tradition of realism, states are frequently prepared to interfere and use international regimes, in order to advance their national interests, even if this means jeopardizing the regime's performance (Lall, 2017). However, research on international regimes' design rarely addresses the possibility that states may form seemingly unsuccessful or idle institutions as a conscious choice, referred to as non-regimes (Dimitrov, 2003, 2020), or that over time, international regimes with similar designs and aims can experience wide variations in vitality (Gray, 2018). Low-performing institutions may in fact be desirable for certain powerful actors and conducive to organizational survival as cases of non-regimes (Dimitrov, 2003; Gutner & Thompson, 2010).

At the same time, low levels of formalization of regional regimes can result in strong forest policy. This counterintuitive finding observed in configuration 1, shows that low levels of formalization in forest focused regimes such as the Montreal Process and Forest Europe can produce strong forest policy. By being in an informal setting, informal structures provide more liberty to develop strategic instruments for producing coherent specific goals while at the same time protecting the member states' autonomy (Abbott & Snidal, 2000; Vabulas & Snidal, 2021; Westerwinter et al., 2021). On the contrary, formalized regimes are legally bound to strictly articulate mandates, objectives and activities which need to be approved by the Conference of the Parties (COPs), after long negotiating processes (Abbott & Snidal, 2000).

These findings expand previous research by providing new evidence that while formalization is a highly relevant condition, rather informal regimes can also lead to strong forest policy. As shown by Vabulas and Snidal (2021) states are increasingly creating informal international regimes to address critical global issues, including high politics issues such

as peace. These results contradict previous claims that in order to get strong environmental policy more formalization is needed (Biermann & Siebenhüner, 2009). Although most research has mainly focused on formal regimes, future studies should also analyze informal structures as drivers of global change.

Our results further show that **issue focus** (condition 3) is also a relevant condition for the development of regime policy. This is evidenced by the absence of the condition in configuration 2 explaining strong regime policy and also by its presence in configuration 4 explaining weak regime policy. As observed in configuration 2 and contrary to our expectations, less forest-focused regimes, such as Mercosur and the EU, can produce strong forest policy. Likely, it is under the umbrella of *trade* regimes, with a hinge on *high politics* (Begemann et al. 2020), and the capacities and resources that come with them, that strong regime policy can be generated. In economically oriented trade rather than forest regimes, the diplomatic settings of member states seem to provide fruitful frame conditions for developing strong forest policies. One explanation might be that in such high politics fora the level of debate with stronger set of actors and actors' networks as well as resource equipment are simply outraging those of classical forest policy fora, hence providing strong coherent forest policy (Begemann et al. 2020). Future studies should, however, also focus on the effects of forest relevant regimes hinging under low politics issues, such as indigenous peoples.

At the same time, contrary to our hypothesis (H3), our results and especially configuration 4 show that issue focused regimes can also lead to weak forest regime policy, such as observed in the cases of ACTO, SAARC, SACEP and COMIFAC. In these Global South cases, such formalized forest-focused regimes might be in place for keeping the member states' sovereign use over their natural resources and territory. They might function as a place-holding non-regime, responding to external western claims on abstaining from forest resource use (Abbott & Snidal, 2000; Gomez Mera, 2005; Humphreys, 2006). As it has been described in the case of ACTO, the existence of rival regional or global agreements might trigger defensive incentives to act as a bloc (Gomez Mera, 2005; Humphreys, 2006; Dimitrov, 2020). Regional integration among developing countries might also serve as a magnet for foreign direct investments, as observed in ACTO and COMIFAC (Gomez Mera, 2005). By creating issue specific formal institutions, member states strengthen the international credibility of their commitments in order to attract investments (Abbott & Snidal, 2000).

**Hegemony** (condition 2) was also found to be a relevant condition. This is evidenced by its absence in configuration 3, which explains the development of strong regime policy in three cases and its presence in configuration 4 explaining weak regime policy in four cases. These results, which contradict our hypothesis (H2), can be interpreted in line with the interest of regime members. While strong hegemony can make strong policy, it is rather the interest of the hegemonic and other powerful regime members which determines whether it is a strong or a weak forest policy being produced under the regime (Dimitrov, 2003, 2020). Exactly this latter outcome was previously described in the cases of ACTO producing weak forest policy in line with Brazil's interest (Gomez Mera, 2005) and in the Montreal Process, producing strong forest policy in line with Canada's interest (Gale & Cadman, 2014). Due to the low number of cases analyzed, our definition of hegemon was only based on economic development (i.e. GDP) and did not consider issue-related hegemony indicators. However, a state's power and potential hegemonic trends are not only relational in abstract terms of military or economic power, which might be the sole criteria in the issue area of security. In other issue areas it is also relational regarding issue-specific sources



of power and potential issue-hegemony (Mitchell & Keilbach, 2001). In the case of forest governance, this may include e.g. a state's total forest area, total area of productive plantations and relative contributions of forest-based industries to the GDP. Future studies should further analyze the relationship between general economic and issue-specific power as well as hegemony, in order to shed light into which type of hegemony leads to strong or weak regime forest policy.

In cases where no clear hegemon is detected, polycentric structures exist where power is distributed among member states or in the international bureaucracy of the regime (Secretariat) as the core actor with the strongest interest to fulfill their mandate (Biermann & Siebenhüner, 2009). The regimes' secretariats, with agency of their own, can strategically build coalitions of the willing members (Dijkstra, 2017) or use NGOs and public-private partnerships to push for their own goals (Debre & Dijkstra, 2021). The institutionalization of such coalitions between the secretariats and actors above and below states can result in large degrees of autonomy of the secretariats (Lall, 2017).

## 5.1 Methodologically critique

While our findings provide many insights and interesting implications, the methodology applied has some limitations, mainly related to the operationalization of the conditions and outcomes. *First*, under the condition of formalization several variables, such as the decision-making system, the characteristics of the secretariats as well as the founding treaties were grouped. This grouping could have resulted in the underestimation of some of these variables. *Second*, our definition of hegemony was only focused on the GDP of the member states, without considerations for issue power; a more flexible definition of powerful regime members might provide more appropriate insights. Additionally, our definition did not account for the number of members in a regime. Due to the operationalization of our definition, a larger number of members would result in a less likelihood of finding a hegemon. *Third*, the identification of forest relevant regimes requires deep empirical knowledge of regime policy prior to the selection of the cases. This might result in the oversight of many forest relevant regimes. *Fourth*, the definition of strong and weak forest policy grouped three variables, which resulted in an overestimation of policy coherence and consistency and underestimation of policy instruments. *Lastly*, our study was based on the regime policy produced at one specific point in time, remaining blind to changes within each regime and potential dynamic of its policy across time.

## 6 Conclusion

In this article we analyzed how three structural factors of regional regimes and their combinations help explain whether the resulting regime policy is strong or weak. In order to do so we used a fuzzy-set QCA to compare 9 regional regimes across the world, including the forest policies they produce, under the overall hypothesis that the regime structure has an effect on the resulting policies. Our results showed that no condition on its own was necessary to produce either strong or weak regime forest policy. However, all three conditions, through three different configurations, created a robust pathway for producing strong regime policy. Strong regime policies were produced when: (1) the absence of formal structures; (2)



the absence of issue focus; or (3) the absence of a clear hegemon were observed. In addition, the combination with presence of all three conditions was found to produce weak regime policy. These results open several prospects for future research on the relationship between the structures and the policies of international regimes. Firstly, and in the context of a highly fragmented forest regime complex with many different regimes stemming from different sectors, strong forest policy was found to not only be produced in forest focused regimes, but also by forest relevant trade regimes with a hinge on high politics. Secondly, our results showed that formal structures and high degrees of institutionalization are not necessarily needed to produce strong policy. Also within informal structures strong forest policy can be developed. These results go in line with recent studies, which highlight the increase in informal structures, even in high politics issues. Thirdly, our results showed that in the issue area of forests the presence of a hegemon does not necessarily lead to strong policy. We, however, observed rather the opposite, with hegemons aiming to prevent meaningful regime policy through non-decisions and non-regimes. However, our study largely remained blind to the member states' detailed interests, which for some hegemons might include to deliberately produce weak regime policy. This is in line with earlier findings explaining weak international forest regime policies due to prevailing forestry industries interests of strong forest states (e.g. Brazil, USA, Finland). Lastly, in order to further assess the causal relationship between regime structures and their resulting policies, an extended set of structural variables with a larger number of regimes, should be scrutinized with more solid statistical analysis like regression analyses.

Hence, we may broadly conclude that strong forest policies may not only be produced by regimes with a clear scope on forests as an issue, but also by non-forest focused ones. This shows that quite specific environmental policies may evolve from thematically quite distant international regimes. Our results further indicate that the hinge on high politics issues such as trade might explain that such cases of less environmentally focused regimes produce strong environmental policy. Moreover, informal regimes are very well able to produce strong environmental policy. In order to produce strong environmental policy, regimes do not require hegemony, but strong environmental policy may also very well be produced in the absence of hegemony. Lastly, our results indicate that formalized regimes with a hegemonic character that clearly address and focus on an environmental issue lead to weak regime policy.

**Supplementary Information** The online version contains supplementary material available at <https://doi.org/10.1007/s10784-024-09641-1>.

**Acknowledgements** This research was funded by the German Research Foundation (DFG), Germany (Grant No. DFG PA 813). Data collection for the MERCOSUR case was funded by the Argentinian National Agency for the Promotion of Research, Technological Development and Innovation, Argentina (PICT 2017–1657).

**Funding** Open Access funding enabled and organized by Projekt DEAL.

## Declarations

**Conflict of interest** The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

**Open Access** This article is licensed under a Creative Commons Attribution 4.0 International License, which permits use, sharing, adaptation, distribution and reproduction in any medium or format, as long as

you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons licence, and indicate if changes were made. The images or other third party material in this article are included in the article's Creative Commons licence, unless indicated otherwise in a credit line to the material. If material is not included in the article's Creative Commons licence and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder. To view a copy of this licence, visit <http://creativecommons.org/licenses/by/4.0/>.

## References

- Abbott, K. W., & Snidal, D. (2000). Hard and soft law in international governance. *International Organization*, 54(3), 421–456.
- Acharya, A. (2014). Global International relations (IR) and Regional worlds. A New Agenda for International studies. *International Studies Quarterly*, 58(4), 647–659.
- Arts, B. (2021). Forest Governance: Hydra or Chloris? Elements in Earth System Governance. Cambridge University Press. ISSN 2631–7818.
- Arts, B., & De Koning, J. (2017). Community Forest Management: An Assessment and Explanation of its performance through QCA. *World Development*, 96, 315–325.
- Balsiger, J., & Prys, M. (2016). Regional agreements in international environmental politics. *International Environmental Agreements*, 16(2), 239–260.
- Begemann, A., Giessen, L., Roitsch, D., Roux, J. L., Lovric, M., Azevedo-Ramos, C., Boerner, J., Becko, C., Cashore, B., Cerutti, P. O., et al. (2021). *Quo vadis global forest governance? A transdisciplinary delphi study* (Vol. 123, pp. 131–141). Environmental Science & Policy.
- Bezerra, J. C., Sindt, J., & Giessen, L. (2018). The rational design of regional regimes: Contrasting amazonian, Central African and Pan-European Forest Governance. *International Environmental Agreements*, 18, 635–656.
- Biermann, F., & Pattberg, P. (Eds.). (2012). *Global environmental governance reconsidered*. MIT Press.
- Biermann, F., & Siebenhüner, B. (2009). *Managers of global change: The influence of international environmental bureaucracies*. MIT Press.
- Brockhaus, M., Korhonen-Kurki, K., Sehring, J., & Di Gregorio, M. (2015). Policy progress with REDD+ and the promise of performance-based payments: A qualitative comparative analysis of 13 countries. Working Paper 196. Bogor, Indonesia: CIFOR.
- Debre, M. J., & Dijkstra, H. (2021). Institutional design for a post-liberal order: Why some international organizations live longer than others. *European Journal of International Relations*, 27, 311–339.
- Dijkstra, H. (2017). Collusion in international organizations: How states benefit from the authority of secretariats. *Global Governance*, 23(4), 601–619.
- Dimitrov, R. S. (2003). Knowledge, Power, and interests in Environmental Regime formation. *International Studies Quarterly*, 47, 123–150.
- Dimitrov, R. S. (2020). Empty institutions in Global Environmental politics. *International Studies Review*, 22, 626–650.
- Dua, A. (2019). *Critical tension: Sufficiency and parsimony in QCA* (p. 0049124119882456). Sociological Methods & Research.
- Gale, F., & Cadman, T. (2014). Whose norms prevail? Policy networks, international organizations and sustainable forest management. *Society and Natural Resources*, 27, 170–184.
- Giessen, L. (forthcoming) (Ed.). *Forests and the two faces of international governance: Customizing international regimes through domestic politics*. Edward Elgar, Series on New Horizons in Environmental Politics.
- Giessen, L., & Sahide, M. A. K. (2017). Blocking, attracting, imposing, and aligning: The utility of ASEAN forest and environmental regime policies for strong member states. *Land Use Policy*, 67, 13–26.
- Gomez Mera, L. (2005). Explaining Mercosur's survival: Strategic sources of Argentina-brazilian convergence. *Journal of Latin American Studies*, 37, 109–140.
- Gray, J. (2018). Life, Death or Zombie? The Vitality of International Organizations. *International Studies Quarterly*, 62, 1–13.
- Gutner, T., & Thompson, A. (2010). The politics of IO performance: A framework. *Rev Int Organ*, 5, 227–248.
- Hall, P. (1993). Policy paradigms, social learning, and the state: The case of economic policymaking in Britain. *Comparative Politics*, 25(3), 275–296.
- Hasenclever, A., Mayer, P., & Rittberger, V. (1996). Interests, power, knowledge: The study of international regimes. *Mershon International Studies Review*, 40, 177–228.
- Hettne, B. (2005). Beyond the 'new' regionalism. *New Political Economy*, 10(4), 543–571.

- Howlett, M., & Rayner, J. (2010). Overcoming the challenges to integration. In: Rayner, J., Buck, A., Katila, P. (Eds.). *Embracing Complexity: Meeting the Challenges of International Forest Governance* (pp. 93–110). A Global Assessment Report. IUFRO World Series. Vienna.
- Howlett, M., Mukherjee, I., & Woo, J. J. (2015). From tools to toolkits in policy design studies: The new design orientation towards policy formulation research. *Policy & Politics*, 43, 291–311.
- Humphreys, D. (2006). *Logjam - Deforestation and the crisis of global governance*. Earthscan.
- Humphreys, D. (2015). Negotiating the future under the shadow of the past: The eleventh session of the United Nations Forum on forests and the 2015 renewal of the international arrangement on forests. *International Forestry Review*, 17(4), 385–399.
- Ide, T., & Mello, P. A. (2022). QCA in International relations: A review of strengths, pitfalls, and empirical applications. *International Studies Review*, 24(1), viac008.
- Ide, T., Rodriguez Lopez, M., Fröhlich, C., & Scheffran, J. (2021). Pathways to water conflict during drought in the MENA region. *Journal of Peace Research* 58.
- Jeon, S., Sarker, P. K., & Giessen, L. (2019). The forest policies of ASEAN and Montréal process: Comparing highly and weakly formalized regional regimes. *Forests*, 10(10), 929.
- Keohane, R. O., & Nye, J. (2012). *Power & Interdependence*. 4th Edition: Longman Classics in Political Science Paperback: Cambridge: Publisher: Pearson.
- Koremenos, B., Lipson, C., & Snidal, D. (2001a). The rational design of international institutions. *International Organization*, 55(4), 761–799.
- Koremenos, B., Lipson, C., & Snidal, D. (2001b). Rational design: Looking back to move forward. *International Organization*, 55(4), 1051–1082.
- Krasner, S. D. (Ed.). (1983). *International regimes*. Cornell University Press.
- Krott, M. (2005). *Forest policy analysis*. Springer Science & Business Media.
- Lall, R. (2017). Beyond Institutional Design: Explaining the performance of International Organizations. *International Organization*, 71, 245–280.
- Lascombes, P., & Le Gales, P. (2007). Introduction: Understanding Public Policy through its instruments? From the Nature of Instruments to the Sociology of Public Policy Instrumentation. *Governance*, 20(1), 1–21.
- Lasse, C. (2019). Tosmana [Version 1.61]. University of Trier. Internet: <https://www.tosmana.net>
- Levy, M. A., Young, O. R., & Zürn, M. (1995). The study of international regimes. *European Journal of International Relations*, 1(3), 267–330.
- Manuamorn, O. P., Biesbroek, R., & Cebotari, V. (2020). What makes internationally-financed climate change adaptation projects focus on local communities? A configurational analysis of 30 Adaptation Fund projects. *Global Environmental Change*, 61, 102035.
- Mello, P. A. (2021). *Qualitative comparative analysis: An introduction to research design and application*. Georgetown University Press.
- Mitchell, R., & Keilbach, P. (2001). Situation structure and Institutional Design: Reciprocity, Coercion, and Exchange. *International Organization*, 55(4), 891–917.
- Nago, M. (2021). Inside forest and climate change cooperation politics: Actors and instruments at work in Congo Basin. Doctoral dissertation. Georg-August-Universität Göttingen, Germany.
- Polo-Villanueva, F., Sarker, P., Giessen, L., & Burns, S. L. (Unpublished). Adapting regional regime design for attracting foreign funds - Brazil customizing the Amazon Cooperation Treaty (ACTO).
- Ragin, C. C. (1987). *The comparative method: Moving beyond qualitative and quantitative strategies*. University of California Press.
- Ragin, C. C. (2008). *Redesigning Social Inquiry: Fuzzy sets and Beyond*. University of Chicago Press.
- Ragin, C. C., & Davey, S. (2016). *Fuzzy-Set/Qualitative Comparative Analysis 3.0*. Irvine, California: Department of Sociology, University of California.
- Rodríguez Fernández-Blanco, C., Burns, S. L., & Giessen, L. (2019). Mapping the fragmentation of the international forest regime complex: Institutional elements, conflicts and synergies. *International Environmental Agreements*, 19, 187–205.
- Sarker, P. K., Rahman, M. S., & Giessen, L. (2018). Regional governance by the South Asia Cooperative Environment Program (SACEP)? Institutional design and customizable regime policy offering flexible political options. *Land Use Policy*, 77, 454–470.
- Sarker, P. K., Rahman, M. S., & Giessen, L. (2019). Regional economic regimes and the environment: Stronger institutional design is weakening environmental policy capacity of the south Asian Association for Regional Cooperation. *International Environmental Agreements: Politics, Law and Economics*, 19(1), 19–52.
- Sarker, P. K. (2021). The forest policies of international regimes in different world regions: issue specificity, formalisation, and hegemony as drivers. Doctoral dissertation, Georg-August-Universität Göttingen.
- Schneider, C. Q., & Wagemann, C. (2012). *Set-theoretic methods for the social sciences: A guide to qualitative comparative analysis*. Cambridge University Press.

- Schulz, C. A., & Levick, L. (2021). Regional patterns of multilateral treaty cooperation: Is there a latin American 'commitment gap'? *International Political Science Review*. <https://doi.org/10.1177/01925121211036417>
- Sikor, T., Auld, G., Bebbington, A. J., Benjaminsen, T. A., Gentry, B. S., Hunsberger, C., Izac, A. M., Margulis, M. E., Plieninger, T., Schroeder, H., & Upton, C. (2013). Global land governance: From territory to flow? *Current Opinion in Environmental Sustainability*, 5(5), 522–527.
- Snidal, D. (1985). The limits of Hegemonic Stability Theory. *International Organization*, 39, 579–614.
- Thiem, A., & Baumgartner, M. (2016). Modeling causal irrelevance in evaluations of configurational comparative methods. *Sociological Methodology*, 46(1), 345–357.
- Underdal, A., & Young, O. R. (2004). *Regime consequences*. Methodological Challenges and Research Strategies.
- Vabulas, F., & Snidal, D. (2021). Cooperation under autonomy: Building and analyzing the informal inter-governmental organizations 2.0 data set. *Journal of Peace Research*, 58, 859–869.
- van der Zon, M., de Jong, W., & Arts, B. (2023). Community enforcement and tenure security: A fuzzy-set qualitative comparative analysis of twelve community forest management initiatives in the Peruvian Amazon. *World Development*, 161, 106071.
- Weber, M. (1980/1922). *Wirtschaft Und Gesellschaft: Grundriss Der Verstehenden Soziologie* (5th ed.). Mohr-Siebeck.
- Westerwinter, O., Abbott, K. W., & Boersteker, T. (2021). Informal governance in world politics. *The Review of International Organizations*, 16, 1–27.
- Wiederkehr, C., Ide, T., Seppelt, R., & Hermans, K. (2022). It's all about politics: Migration and resource conflicts in the global south. *World Development*, 157, 105938.
- Young, O. R. (1991). Political leadership and regime formation: On the development of institutions in international society. *International Organization*, 281–308.
- Young, O. R. (Ed.). (1999). *The effectiveness of international environmental regimes: Causal connections and behavioral mechanisms*. MIT Press.
- Zelli, F., Bäckstrand, K., Nasiritousi, N., Skovgaard, J., & Widerberg, O. E. (Eds.). (2020). *Governing the climate-energy Nexus: Institutional complexity and its challenges to Effectiveness and Legitimacy*. Cambridge University Press.

**Publisher's Note** Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

## Authors and Affiliations

**Pradip Kumar Sarker<sup>1,2,3</sup> · Lukas Giessen<sup>3</sup> · Max Göhrs<sup>2</sup> · Sohui Jeon<sup>4</sup> · Minette Nago<sup>2</sup> · Fredy David Polo-Villanueva<sup>3</sup> · Sarah Lilian Burns<sup>3,5,6</sup>**

✉ Sarah Lilian Burns  
salibu@agro.unlp.edu.ar; sarah\_lilian.burns@tu-dresden.de

<sup>1</sup> Thünen Institute of International Forestry and Forest Economics, Hamburg, Germany

<sup>2</sup> Chair of Forest and Nature Conservation Policy and History, Georg-August University, Göttingen, Germany

<sup>3</sup> Chair of Tropical and International Forestry, Technical University Dresden, Dresden, Germany

<sup>4</sup> School of Social Sciences, University of New South Wales, Sydney, NSW 2052, Australia

<sup>5</sup> Laboratorio de Investigación de Sistemas Ecológicos y Ambientales (LISEA), Facultad de Ciencias Agrarias y Forestales, Universidad Nacional de La Plata, La Plata, Argentina

<sup>6</sup> National Scientific and Technical Research Council of Argentina (CONICET), La Plata, Argentina