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DATA PAPER

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Transnational Forest Governance Arrangements dataset (TFGA-dataset)

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Abstract

Key message The Transnational Forest Governance Arrangements dataset is the first to compile a comprehensive set of *governance arrangements whose spatial ambits span three or more national jurisdictions, and which formally address forests as a main issue*. As this dataset provides information on key institutional variables of these arrangements for the year 2023, it can be reused to assess the theoretical argument that regional governance arrangements are more effective than their global counterparts, as well as to explore the drivers of institutional fragmentation in transnational forest governance. The complete dataset is available at https://zenodo.org/records/14831667. The metadata describing the data-set is available at: https://metadata-afs.nancy.inra.fr/geonetwork/srv/fre/catalog.search#/metadata/42c6ab18-14e8-4bd7-9669-991896c1e467.

Keywords Regional environmental cooperation, International forest regime, Institutional design, Membership, Spatial ambit, Issue scope, Centralisation, Control, Governance function

1 Background

The dataset is the result of the project 'Interplay of regional forest regimes: combining qualitative and quantitative insights on regional powers', funded by the Deutsche Forschungsgemeinschaft. It contains a comprehensive list of Transnational Forest Governance Arrangements (TFGAs) and data on variables associated with five of their key institutional dimensions: membership, spatial ambit, issue scope, centralisation, control and governance function (Polo-Villanueva et al. 2024a, b). While the mapping of TFGAs was based on four main data sources, the initial list of arrangements was supplemented using multiple alternative sources. Data on both general and institutional dimensions were collected and recorded for the year 2023. Subsets of this dataset have been used by the authors to describe the institutional variability of regional forest governance arrangements (Polo-Villanueva et al., forthcoming), explore the drivers of state participation in multilateral regional climate-forest cooperation (Polo-Villanueva et al. 2024a, b) and analyse the factors that motivate EU member states' participation in regional forest cooperation (Polo-Villanueva et al., forthcoming).

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2 Methodology

This section is divided into three parts. The first presents our conceptualisation of Transnational Forest Governance Arrangements (TFGAs). The second describes the steps taken to map such arrangements. The third presents the institutional dimensions that were measured and coded.

2.1 Transnational forest governance arrangements: clarifications on the scope

Governance arrangements are 'formal and informal bundles of rules, roles and relationships that define and regulate

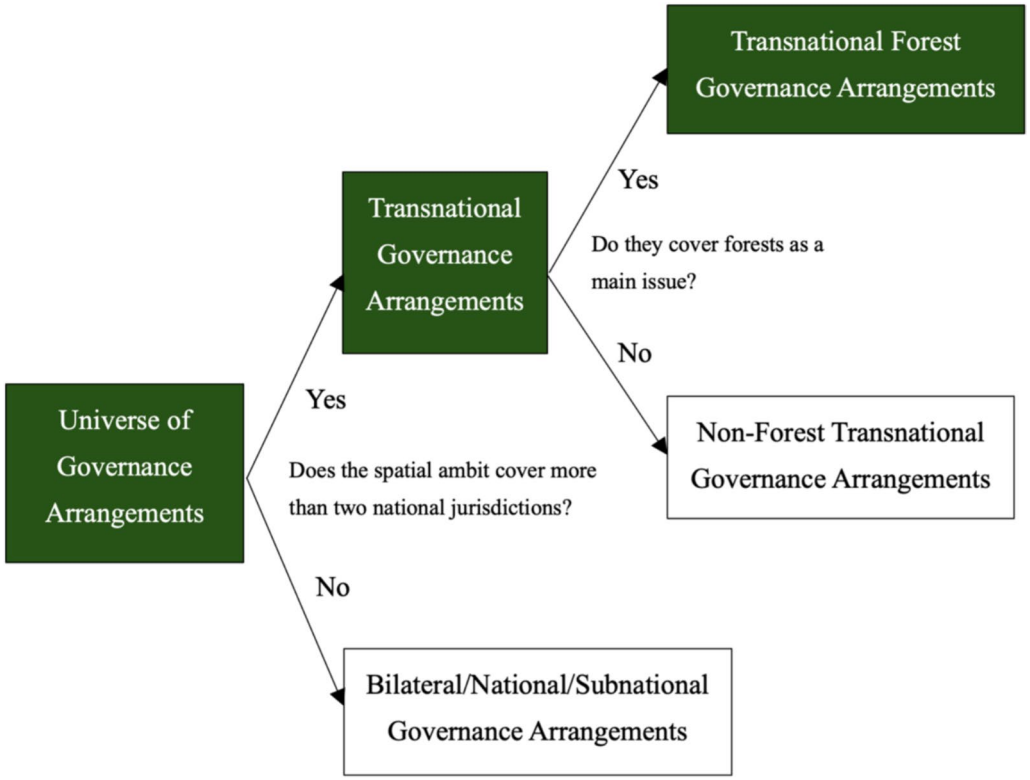

Fig. 1 Conceptualisation of Transnational Forest Governance Arrangements (based on Abbott & Snidal 2009; Giessen & Sahide 2017; Jeon et al. 2019)

social practices of state and non-state actors' (based on Abbott & Snidal 2009:346). This definition determines the concept of TFGAs in two ways. First, it extends previous definitions of governance, which typically focus on the state as the main actor (international governance), to include non-state actors (transnational governance) (Abbott & Snidal 2009; Rodríguez Fernández-Blanco et al. 2019; Westerwinter 2021). Second, the definition moves away from understanding organisations as the main institutions in governance to also consider the role of more informal institutions as crucial (Vabulas & Snidal 2013, 2021; Westerwinter 2021). The concept of governance arrangements is thus similar to that of regimes (Krasner 1982).

In addition to the above, our concept of TFGAs relies on two other criteria: spatial ambit and issue scope. First, we focus on the spatial dimension of transnationality, which refers to the fact that the geographical area of application of transnational governance arrangements must cover 3 or more national jurisdictions. We have not considered the membership dimension of transnationality—which refers to the fact that member states of transnational governance arrangements must include 3 or more countries—because states do not participate in all arrangements nor are necessarily the most important members of them (Koremenos et al. 2001). Second, in relation to the issue scope, we focus on governance arrangements that address forests formally among their main aims and/or mission statements. This means that we include in our database arrangements that address forests as the only main issue (forest-focused governance arrangements) or in conjunction with other main issues (forest-related governance arrangements) (Giessen et al. 2016; Jeon et al. 2019). We have excluded those arrangements that do not formally deal with forests but whose activities are relevant to their governance (forest-relevant governance arrangements) because their mapping requires deeper empirical insights (Begemann et al. 2021; Polo Villanueva et al. 2023).

In summary, based on international relations and forest governance scholarship, we conceptualise TFGAs as *governance arrangements whose spatial ambits span three or more national jurisdictions, and which formally address forests as a main issue* (Abbott & Snidal 2009; Giessen et al. 2016; Jeon et al. 2019; Vabulas & Snidal 2013). See Fig. 1 for a depiction of our conceptualisation.

2.2 Mapping of transnational forest governance arrangements

The mapping of TFGAs was based on four main sources, the first three of which are widely used in international relations literature (Balsiger & Prys 2016; Balsiger & VanDeveer 2012; Mitchell 2006; Mitchell et al. 2020; Westerwinter 2021). The first source is the Yearbook of

International Organizations online database (Union of International Associations 2022), which contains information on more than 75,000 governance arrangements. The second source is the Commonwealth of Independent States Legislation Database (CIS Legislation Database 2022), which contains more than 57,000 documents related to the legislation of the 11 countries that are members of this organisation. The third source, the International Environmental Agreements Database (Université Laval 2022), contains information on almost 4000 international governance arrangements. Lastly, the fourth source is the Directory of Commonwealth NGOs related to forestry (Commonwealth Forestry Association 2022), maintained by the Commonwealth Forestry Association.

Data extraction was carried out between April 2022 and January 2023 following the steps outlined below. First, we obtained a subset of the Yearbook of International Organizations by extracting only organisations that mentioned forest-related terms (i.e. Forest* OR Deforest* OR Silv* OR Trees) in the sections title, aims and/or activities of their profile. We did not consider terms such as timber or wood to be forest-related because we focus on the land-use component of forests rather than the products, goods or services they provide. Similarly, we filtered the Commonwealth of Independent States Legislation Database and the International Environmental Agreements Database by retrieving all arrangements that mentioned forest-related terms on their title and/or full text. On the other hand, as no automatic filtering was possible for the Commonwealth NGO Directory, we retrieved from it all the international organisations listed. Hereafter, we complemented our mapping by including institutions listed in the FAO Forestry institutional website (FAO 2023) and the observers list of Forest Europe (Forest Europe 2022). Moreover, we also used the core-institution mapping method to search for governance arrangements mentioned in the minutes of the United Nations Forum on Forests (Rodríguez Fernández-Blanco et al. 2019; United Nations 2022).

Once the data were extracted, duplicates were eliminated. In addition, when an organisation was based on several arrangements, as in the case of the International Tropical Timber Organization—which is based on the International Tropical Timber Agreements of 1983, 1994 and 2006, the arrangements were kept in the database and the organisation was eliminated. In total, we obtained an initial list of 920 arrangements.

To filter such initial list, we operationalised our TFGA concept as follows. We initially filtered out hits that lacked the essential characteristics for consideration as *governance arrangements*. These characteristics are (i) minimum degree of salience, (ii) minimum degree of independence and (iii) organisational membership. For an institution to be salient enough to be considered in our database, it must publicly disclose its governing goals on a website or inception document. Institutions whose only aim was to negotiate other arrangements, such as the Intergovernmental Negotiating Committee for a Legally Binding Agreement on Forests in Europe, were discarded. By minimum degree of independence, we denote that if an institution is embedded in a larger one, for it to be considered as a separate institution in our database, it has to be based on an additional arrangement among members. Sub-bodies of organisations that are not based on a separate arrangement and were highly dependent of the parent organisation were then discarded (e.g. Forestry Commissions of the Food and Agriculture Organisation of the United Nations). Organisational membership refers that the governance arrangement must include organisational actors as members—actors with the right to vote in decision-making processes. Institutions based on arrangements among only individuals were discarded (e.g. Forest Invasive Species Networks promoted by the Food and Agriculture Organisation of the United Nations).

Following the initial filtering process, the preliminary list of governance arrangements underwent a second round of filtering, designed to identify elements that specifically pertain to the *transnational level*. For this purpose, we selected only those arrangements whose spatial ambits span three or more national jurisdictions. Thus, arrangements focused on the bilateral, national or sub-national level were discarded. Lastly, to identify all transnational governance arrangements *addressing forests*, we selected only the regional institutions that mention forest-related terms on their main aims and/or mission statements.

The aforementioned filtering processes were carried out by a small team consisting of the lead author and the second co-author. Both researchers worked independently and used websites and official documentation as data sources to identify cases. Once a first set of cases was identified, results were compared, and the initial experiences were used to harmonise filtering practices. As a final result, we obtained a dataset of 88 TFGAs. This list was also reviewed by the last co-author who, based on her expertise, validated the selection of cases. In addition, we extracted general information for each TFGA (i.e. short name, full name, data source in which the arrangements were first identified, inception date and, if the arrangement no longer exists, its termination date). The date of inception was determined by the date on which the organisation linked to the arrangement was established or, if there was no organisation linked to the arrangement, the date of entry into force (after ratification) of the arrangement.

2.3 Coding institutional features

The design of transnational institutions is as a two-step process. First, actors meet and decide what issue(s) they would like a new arrangement to address. Next, they decide on

the institutional features that the arrangement will adopt (Westerwinter 2021). Starting from the assumption that the institutional design is a rational process in which actors seek to achieve the greatest benefits at the lowest costs (Koremenos et al. 2001), we argue that the institutional design of TFGAs vary meaningfully across five dimensions: *membership*, *spatial ambit*, *issue scope*, *centralisation*, *control* and *governance function* (Balsiger & Prys 2016; Jeon et al. 2019; Koremenos et al. 2001; Westerwinter 2021). Therefore, we describe below the variables we used to assess each of these dimensions as well as how they were coded.

The *membership* dimension provides information on who is a member of an arrangement (Koremenos et al. 2001). Such dimension indicates the extent to which the arrangements are of state, non-state or hybrid nature (Westerwinter 2021). We assessed this dimension by measuring three variables: the number of states that are members, the number of firms that are members and the number of CSOs that are members. To measure them, we first developed a list of states participating in the international system based on the Correlates of War project (Correlates of War 2022). Then, we measured how many states as well as intergovernmental organisations were participating, as of 2023, in TFGAs. To measure the number of firms that were members, we counted the number of companies, business associations and foundations that participated in each TFGA. Similarly, to measure the number of civil society organisations that were members, we counted the number of non-governmental organisations, coalitions of non-governmental organisations, universities and research institutes participating in each TFGA. Where recent information on state, firm and/or CSO participation was lacking, we used the most recent information available.

The *spatial ambit* dimension refers to the geographical area of application the arrangements. This dimension informs not only about the ambitions of the arrangements in spatial terms but also about the criteria used to delimit them (Balsiger & Prys 2016). We therefore use two sets of variables to measure this dimension: the first is linked to the regions of the world in which its spatial ambit is located, and the second relates to the criteria used to delimit their spatial ambit. The first set is constituted by six variables that capture whether the spatial ambit is present, or not, across six world regions: Africa, Asia, Europe, Latin America and the Caribbean, North America, and Oceania. If the spatial ambit is fully or partially included in any of these regions, the variable associated with that region was coded as 1. If not, the variable was coded as 0. Since a domain may extend over more than one world region, the coding of such variables was not mutually exclusive. The second set is constituted by three variables: delimitation by contiguity, delimitation by ecoregions and delimitation by other criteria. We considered the spatial ambit to be delimited by contiguity if it is not global and of a 'single piece.' Ecoregional delimitation is associated with the spatial ambit being delimited by biogeographic characteristics, which translates into arrangements focusing on, for example, biomes such as tropical or temperate forests. Delimitation by other criteria refers to whether other conditions, such as socio-economic level, were considered to delimit the area of application of an arrangement. As in the previous set of variables, these variables were coded binary. Variables were coded as 1 if they were delimited by such criteria, and 0 if they were not. Furthermore, if all these variables were coded as 0, meaning that the ambit was not delimited, it meant that the arrangement had a global scope.

The *issue scope* dimension refers to the issues covered by governance arrangements. This dimension informs on the degree of focus that each arrangement has on the issue forests. To measure this dimension, we used eight variables associated with a list of issues collected from Polo-Villanueva et al. (2024a, b): forest, trade, human rights, climate, food security, biodiversity, development and technology. These variables were coded as 1 if keywords related to those issues were mentioned among the main goals and/or mission statements of the arrangements (Westerwinter 2021). If no keywords associated with a given issue were mentioned on such sections, these variables were then coded as 0. Since an arrangement can cover more than one issue simultaneously, issue scope related variables were also not mutually exclusive.

The *centralisation* dimension relates to the existence of a single focal entity (i.e. secretariat) that performs important institutional tasks within an arrangement (Koremenos et al. 2001). Having a secretariat is highly controversial for states, as it directly collides with their sovereignty, but could also entail risks for the reputation of non-state actors. The secretariat of a non-state or hybrid governance arrangement could, for example, take decisions that may later be criticised and labelled as greenwashing, thus damaging the reputation of their members (Demirag et al. 2012). Therefore, we measure the centralisation dimension using three variables: existence of a secretariat, existence of a *permanent* secretariat and existence of an *independent* secretariat. An arrangement is considered to have a secretariat when there is an institutional body whose purpose is to support both the governance arrangement and its members, through the sharing and circulation of information, providing technical assistance, preparing meetings or carrying out other similar activities (Westerwinter 2021). We consider a secretariat to be permanent when it is not of a rotating nature and is instead established for the medium or long term in a given city and country. The secretariat is considered independent when it is not embedded/hosted by other institution (Westerwinter 2021). All centralisation related variables were coded binarily, meaning that if the arrangement presented any of the above-mentioned

characteristics, the variable was considered as 1, while if it did not, the variable was coded as 0.

The *control* dimension looks at how collective decisions are made within governance arrangements (Abbott & Snidal 2009; Balsiger & VanDeveer 2012). As most decisions made in governance arrangements tend to be based on consensus, we measure this dimension using three variables: governance share of states, governance share of firms and governance share of CSOs. We calculate these governance shares by identifying the voting weight that each type of actor holds. To do so, we rely on both the rules of the voting processes and the composition of the members of the arrangement in terms of type of stakeholder and voting power. The value of this variable is a percentage that varies between 0 and 1, which means that if the value is 0, the type of actor has no decision-making power, and 1 means that the type of actor has full decision-making power.

The dimension of *governance function* relates to the function a governance arrangement is mandated/expected to develop. To measure this dimension, we used variables associated to the list of functions developed by Westerwinter (2021): agenda-setting/lobby, standard setting, implementation, monitoring, funding, capacity building and knowledge creation. Agenda-setting captures whether an arrangement is involved in adding an issue to the international agenda. Standard-setting records whether an arrangement develops international rules and norms. Implementation indicates whether an arrangement implement existing rules and standards. Monitoring captures whether arrangements monitor the implementation of international rules and standards. Funding records whether an arrangement is involved in funding projects or other activities. Capacity building relates to whether the arrangement develops capacity building activities that target a small group of actors. Lastly, knowledge creation captures whether an arrangement produces new knowledge and/or disseminate information.

Lastly, it is important to highlight that institutional dimensions are not permanent but are susceptible to change over time (Tigre 2017). Thus, TFGAs could change their different dimensions in order to adapt to the changing international context.

3 Data access and metadata description

The complete dataset is available at the ZENODO repository, https://zenodo.org/records/14831667 (Polo-Villanueva et al. 2024a, b).

4 Technical validation

Both mapping and coding were led by the first author and implemented with the support of the second author. Multiple iterations for calibration purposes were performed during all methodological stages to ensure correct data collection and recording. In addition, the last author was responsible for, based on her expertise, checking the correct mapping and filling of the dataset.

5 Reuse potential and limits

The dataset is the result of a comprehensive mapping of TFGAs, and the coding of variables associated with five of their key institutional dimensions. The authors have used subsets of the dataset to quantitatively describe regional forest governance (Polo-Villanueva et al., forthcoming), explore the drivers of state participation in the multilateral regional forest-climate governance interface (Polo-Villanueva et al. 2024a, b) and analyse the factors that motivate EU member states' participation in regional forest cooperation (Polo-Villanueva et al., forthcoming). However, this dataset can still be reused to answer other various research questions and, thus, contribute to academic debates. Two of these are presented below.

First, the dataset can be used to build on previous efforts to study the effectiveness of transnational forest governance (Börner et al. 2020; Pattberg et al. 2015; Sarker et al. 2024). For example, as it is the first dataset that clearly distinguishes between global and non-global transnational forest governance arrangements, scholars could test the theoretical assumption that the non-global elements are more effective than the global ones in dealing with environmental problems such as deforestation (Balsiger & Prys 2016; Balsiger & VanDeveer 2012). This could be done by comparing the performance of global and regional arrangements in terms of the outputs they generate, or assessing the correlation between the number of regional governance arrangements that are implemented in different regions of the world and the evolution of different forest-related outcome variables (e.g. deforestation rate or forest cover) in those regions (Gutner & Thompson 2010; Knill et al. 2012; Polo Villanueva et al. 2023; Sarker et al. 2024).

Second, the dataset can contribute to the literature investigating the causes of the fragmentation of the transnational forest regime complex (Biermann et al. 2009; Giessen 2013; Rodríguez Fernández-Blanco et al. 2019). In this sense, researchers can analyse how the different institutional features coded in the dataset can be linked to the participation of different groups of states. Are countries from the global north and south participating in forest governance arrangements with similar institutional designs or not? What kind of features does each country group prefer? Why? Similar comparisons could be made for example between countries with different levels of democracy, forest area, etc. Exploring these types of questions may reveal the reasons behind the great diversity of institutional features that are present in transnational forest governance (Pattberg & Widerberg 2015).

Finally, regarding the limits of the dataset, we argue that the main limitation is the lack of longitudinal data showing

the evolution of institutional dimensions across time. Thus, we invite researchers to extend the dataset by measuring these variables in other years. This would allow scholars to conduct robust statistical tests that provide strong evidence of the association between different sets of variables, such as between institutional features and variables associated with the effectiveness of TFGAs (Sarker et al. 2024).

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Authors' contributions
The first author was responsible for conceptualisation, methodological design, data collection and coding, as well as for the drafting of the data paper. The second author supported the data collection and coding as a research assistant. The third and fourth authors supervised the first author and contributed to the conceptualisation, methodological design and elaboration of the final version of the data paper. The authors read and approved the final manuscript.

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Data availability
The datasets generated are available in the ZENODO repository, https://zenodo.org/records/14831667and the metadata describing the data set are accessible at: https://metadata-afs.nancy.inra.fr/geonetwork/srv/fre/catalog.search#/metadata/42c6ab18-14e8-4bd7-9669-991896c1e467.

Declarations

Ethics approval and consent to participate
Not applicable.

Consent for publication
All authors gave their informed consent to this publication and its content.

Competing interests
The authors declare no conflict of interest. The funders had no role in the design of the study; in the collection, analyses or interpretation of data; in the writing of the manuscript; or in the decision to publish the results.

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