Understanding Institutional Change: The Evolution of Transboundary Water Agreements

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Common resources such as transboundary waters are usually governed by international agreements, which serve to clarify states' consent to cooperate and define the commitments they make to each other in the international arena. Since 1814, approximately 450 international, freshwater-related agreements have been negotiated over non-navigational issues of water management. They are listed by the Transboundary Freshwater Dispute Database (OSU) and serve a variety of governance issues such as flood control, hydropower projects and allocation for consumptive and non-consumptive uses in international basins.

Treaties are generally renegotiated and adjusted in order to respond to changed circumstances. Due to increased climate change and a continuously changing environment the governance of transboundary freshwater systems such as lakes, rivers, streams or aquifers is particularly susceptible to uncertainty. Treaties governing shared water resources therefore benefit from being flexible and adaptable to emerging challenges. Treaty renegotiation, however, is costly and transaction costs are expected to rise whenever new rules need to be agreed upon or whenever institutional reform needs to be implemented. Hence, institutions not only need to be flexible but also robust; states have to be able to uphold their mutual commitments and certain policy processes need to continue to work satisfactorily, also when confronted with sudden or unexpected social and physical challenges. This may explain why some treaties remain intact after their date of signature, while others are adjusted over time, through the practice of renegotiation.

Because of the challenges that common pool resource systems constantly face, a discussion about flexibility and robustness trade-offs is relevant to the process of crafting effective institutional arrangements. The trade-off between treaty flexibility and robustness is not fixed and largely depends on the context and the preferences of the signatory states. Treaty negotiators decide which elements of the treaty will be more robust and which ones more flexible. The type of adopted flexibility mechanisms eventually depends on the context in which the treaty is negotiated. For example, a treaty cannot be resilient to two different potential outcomes of climate change - predicted to lead to more variability or more droughts – and maintain the same level of performance.

While interest in regime design and the trade-off between flexibility and robustness or stability grows, extant research so far failed to answer why some international treaties are renegotiated, while others remain stagnant. While it is obvious that treaty adjustment does not occur in a vacuum, it remains unclear what the main drivers of adjustment - or the lack thereof - are. The field of institutional analysis has been criticised for having an inadequate understanding of change and for failing to distinguish among different patterns of change. Knowledge and tools to examine what shapes institutional dynamics and the evolution of
design are lacking and only few political analysts have looked into the issue of how international institutions are likely to evolve after they are established. This is especially the case for transboundary water agreements: while a few scholars already examined the institutional design of such treaties and while few case studies on the evolution of international water regimes are available no attempts so far have been made to document or explain the institutional evolution or the existing variety of adjustment patterns in such regimes.

The knowledge gap motivates us to examine the role of both endogenous and exogenous factors in affecting the possibility and outcome of treaty renegotiations. The paper develops a typology of institutional change for the case of transboundary water treaties (including stagnant treaties, treaties that change by amendment and treaties that change by replacement) and identifies design variables that may trigger or hinder adjustment. These include flexibility mechanisms (conflict resolution, periodic review and amendment clauses) and escape or termination mechanisms (withdrawal, denunciation, duration and exit clauses). A large number of treaties are coded according to this typology. To examine the effect of outside factors on renegotiation, treaties are also evaluated and coded according to a series of control variables, clustered along those that affect climate zone and region, a history of military dispute, type of riparian relations, flood occurrence, water variability, the number of signatories and the number of previous renegotiations. From a treaty design perspective, the initial outcomes of our study attest that a treaty is more prone to be institutionally stable when it contains mechanisms for conflict resolution - hence, when it is more flexible. Other significant determinants for treaty stability (or robustness) are the number of signatory parties (bilateral), the region (Europe), the type of riparian relations (up- and downstream) and the climate zone (temperate climate). The results further demonstrate that a treaty is more prone to renegotiation when it is multilateral, when the signatories share a history of military dispute and when it was renegotiated before. The frequency of flood occurrences did not appear to affect treaty renegotiation (the effect of water variability is under review).