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Does environmental peacemaking between states work? Insights on cooperative environmental agreements and reconciliation in international rivalries

Abstract

The literature on environmental peacemaking argues that cooperation in the face of shared environmental challenges can facilitate further cooperation, trust building, and eventually peace between states in conflict. This study uses a cross-case, multi-method research design to test this proposition. More specifically, it argues that the conclusion of a cooperative environmental agreement can make a positive impact on reconciliation between rival states. Based on a new dataset on international rivalries, transboundary protected areas and international freshwater agreements, this study first conducts a statistical analysis and a qualitative comparative analysis (QCA). The results are then verified and refined by six case studies. Triangulation of findings from all three methods suggests that the conclusion of a cooperative environmental agreement facilitates reconciliation in international rivalries. But this effect is contingent on a number of scope conditions, such as high environmental attention, internal political stability, wider patterns or traditions of environmental cooperation, and already ongoing processes of reconciliation.

Keywords: environment; peacemaking; peacebuilding; rivalry termination; conflict; agreement

1 Introduction

Scholars as well as policy makers have repeatedly articulated concerns about the possibility that environmental stress facilitates armed conflict and even war (Ide & Scheffran, 2014; Koubi et al., 2014; McDonald, 2013). From the early 2000s onwards, an alternative stream of literature has developed by asking whether shared environmental challenges can facilitate cooperation and peace between conflict parties, irrespective of whether the environment is a source of or factor in the conflict. Two broad streams of research can be distinguished within this “environmental peace perspective” (Ide & Scheffran, 2014: 273), though there are considerable overlaps. First, research on environmental peacebuilding focusses on the environmental dimensions of peacebuilding, especially in intra-state post-conflict settings. Distribution of land, access to water and water-related services, and the governance of high-value resources are among the issues discussed in this context (Bruch, Muffett & Nichols, 2016; Swain, 2016).

Second, studies of environmental peacemaking discuss whether shared environmental challenges “can be an [...] effective catalyst for reducing tensions, broadening cooperation, fostering demilitarization, and promoting peace” (Conca, 2000: 226) within and especially between states. This approach is particularly interesting as it implies that environmental problems such as land degradation, water pollution or biodiversity loss provide not only challenges but also opportunities, namely for cooperation and peace promotion in settings of (perceived) environmental interdependence (Conca & Dabelko, 2002). Environmental peacemaking is hence highly relevant in an age characterized by accelerating environmental degradation and the continued existence of severe inter-state tensions.

So far, research on environmental peacemaking between states is mostly inconclusive. Summarising the findings from several case studies, Conca (2002: 4) states that “[i]t remains unclear whether and exactly how environmental cooperation can reduce the likelihood, scope, or severity of [...] violence and insecurity.” Ali (2007), Kakabadse et al. (2016) and Martin et al. (2011) found that transboundary cooperation on conservation can have a positive impact on tense inter-state relations if certain conditions are present, such as long-term informal exchanges, elite support or the availability of economic gains. Other studies claim that such conservation cooperation only serves the interest of political elites, marginalizes local inhabitants, and has little impact of wider relations between states (Barquet, 2015; Duffy, 2002; van Amerom & Büscher, 2005). Similarly, case studies draw equivocal conclusions when investigating the impact of water-related cooperation on inter-state peacemaking in Asia (Weinthal, 2002), Africa (Swatuk, 2015), the Balkans (Krampe, 2016), the Middle East (Aggestam & Sundell-Eklund, 2014; Jägerskog, 2007) or Cyprus (Akçalı & Antonsich, 2009; Zikos, Sorman & Lau, 2015).

These studies are certainly insightful, but different definitions of key terms limit comparability, and in general, there are few cross-case studies in environmental peacemaking research (Krampe, 2017). More than a decade ago, Yoffe et al. (2003) found that international cooperation over water is more likely than conflict. It has also been established that well-designed water treaties reduce the likelihood of (water-related) militarized disputes between states (Mitchell & Zawahri, 2015; Tir & Stinnett, 2012) and increase the likelihood of cooperation (Dinar et al., 2014). According to Barquet et al. (2014), transboundary protected areas (TBPAs) make the occurrence of militarized inter-state disputes in Africa, Asia and the Middle East less likely in the long term. But these studies tell us little about whether (and how) shared environmental challenges and environmental cooperation not only inhibit (resource-related) violence, but also facilitate peacemaking between states in conflict.

It is precisely this question which this study seeks to answer. To do so, it first specifies its conceptual framework (section 2) and the data used (section 3) before employing a three-staged, multi-method research strategy: First, a statistical analysis of a large number of cases is conducted (section 4). Second, a qualitative comparative analysis (QCA) is performed for a medium number of cases to take causal complexity into account (section 5). In order to perform these two analyses, a new dataset on cooperative environmental agreements and inter-state rivalries is constructed. Finally, six cases are considered in greater detail to verify the plausibility of causal links, gain insights on contradictory cases, and identify possible omitted variables (section 6). Based on a triangulation of results from the three methods, the final section (7) concludes that environmental cooperation is likely to have a positive impact on inter-state peacemaking if a number of context factors are present. Avenues for future research are outlined as well.

2 Theoretical background: environmental peacemaking

Environmental problems and the challenges they present are suitable to initiate cooperation between states in conflict for a number of reasons: They are often sufficiently de-securitized to allow for cooperation even in situations of enmity, cross national borders, are frequently conceived as common and external threats, allow the realization of shared benefits and “diffuse reciprocity” (Conca, 2000: 233), require long time horizons, and often receive attention from academic and civil society actors which can act as (transnational) pressure groups (Conca, 2002; Lejano, 2006). After the initiation of environmental cooperation, two (mutually not exclusive) mechanisms might start to work (Ide & Scheffran, 2014; Lejano, 2006). First, once cooperation is established, transaction costs for further cooperation are reduced while opportunity costs for not extending cooperation rise, thus causing environmental cooperation to spill-over to other areas. Increased cooperation and interdependence, in turn, make extensive conflict irrational and empirically unlikely (Gartzke, Li & Boehmer, 2001). Second, cooperation to address shared environmental problems can stimulate interactions between government officials and civil society from both states, which eventually build understanding, mutual trust and thus a decrease in hostility (Maas, Carius & Wittich, 2013).

However, there are by no means automatic links either between environmental challenges and environmental cooperation or between environmental cooperation and peacemaking. First, environmental challenges are not objective facts. Political elites and social groups from different countries can perceive and interpret the extent, urgency and transnational nature of the same environmental challenge in various ways (Adger et al., 2013; Litfin, 1999). And even if there is consensus about the existence and severity of a shared environmental challenge, state officials

nevertheless may refrain from cooperation because hostility levels are too high (Akcinaroglu, DiCicco & Radziszewski, 2011).

To circumvent this issue, the study at hand uses the conclusion (or signature) of environmental agreements as the independent variable. Such agreements indicate that representatives of the participating states acknowledge the existence of an environmental challenge, of a related ecological interdependence, and of some necessity to address the underlying environmental problem (Griffin & Ali, 2014). If environmental treaties are concluded, one can also exclude the possibility that inter-state relationships are too tense to allow for any kind of common problem solving. This is crucial because the literature suggests that shared environmental problems and their cooperative handling facilitate rather than initiate reconciliation in international conflicts (Barquet, Lujala & Rød, 2014; Kelman, 2012).

More specifically, the analysis focuses on the conclusion of environmental agreements between two states (bi-lateral agreements) or between a limited number of states from the same world region (mini-lateral agreements). Such bi-/mini-lateral environmental agreements indicate the perceived necessity of regional cooperation to address environmental challenges and provide opportunities for more intense cooperation between actors from a few states. This can be contrasted with multi-lateral, supra-regional environmental agreements, which do not necessarily facilitate interactions between two specific (conflict) parties (Karlsson-Vinkhuyzen & McGee, 2013).

Second, environmental cooperation in general and the conclusion of environmental agreements in particular can have no or even counterproductive effects on peacemaking, or in fact be not very cooperative at all. Using Israel and Palestine as a case study, Zeitoun and Mirumachi (2008) as well as Selby (2003) illustrate how environmental agreements are used as indicators of cooperation, but can mask severe inequalities and the related conflicts. Other agreements are very shallow and contain little more than declarations of intent, hence not requiring any significant pre- or post-signature interactions (Mitchell, 2003). And finally, environmental cooperation as well as the respective agreements can be designed in a very technical and/or non-conflict sensitive way, thus inhibiting peacemaking effects (Feil, Klein & Westerkamp, 2009).

Consequently, this study uses only cooperative (bi- or mini-lateral) environmental agreements (CEAs) as the dependent variable. CEAs are environmental agreements that contain (i) explicit and specific declarations about the intention of transboundary cooperation and/or peacemaking, for instance by using the label “peace parks” (Ali, 2011), or (ii) concrete design features that ensure intense international cooperation, such as river basin organizations (Mitchell & Zawahri, 2015).

From the discussion in this section, I derive the following hypothesis on environmental peacemaking to be tested in this study: *The conclusion of cooperative bi- or mini-lateral environmental agreements facilitates processes of peacemaking between states in conflict.*

3 Data

A first step in empirically testing the hypothesis developed in the previous section is to create a dataset on CEAs and inter-state conflicts that can be utilized for the statistical analysis and the QCA (see appendix 1 for the full data).

There is agreement in the empirical literature that international freshwater agreements and the establishment of TBPA have a high potential to induce environmental peacemaking dynamics (Barquet, Lujala & Rød, 2014; Brochmann, 2012; Martin et al., 2011; Yoffe, Wolf & Giordano, 2003). Such treaties are generally bi- or mini-lateral and allow states to realize shared gains. Freshwater/conservation issues also provide decision makers with some flexibility to combine a range of low politics (e.g., shared data collection) and high politics (e.g., border control) topics and to consult with academics and NGOs.

In addition, comprehensive datasets on both kinds of environmental agreements exist. Data on international freshwater treaties between 1946 and 2007 are obtained from the updated Transboundary Freshwater Dispute Database (Giordano et al., 2014). Treaties which were minor, not-signed between states, just amendments to prior treaties, or which just concerned financial matters were excluded from the analysis. A list of TBPA for the period 1946-2007 was compiled by combining the UNEP-WCMC Global List of Transboundary Protected Areas (Lysenko, Besançon & Savy, 2007) with a shapefile of global conservation areas (kindly provided by Charles Besançon) and a list of establishment years for the national protected areas (kindly provided by Karina Barquet).

Two strategies are used to identify CEAs. For TBPA, I check whether agreements contain specific declarations about transboundary cooperation or peacemaking. Indicators are a common name and transnational management practices, labelling the TBPA as a peace park, or formally nominating the TBPA as a transboundary Ramsar site (Ali, 2011; Griffin & Ali, 2014). For international freshwater treaties, I checked whether they contained one of the following design elements: joint monitoring, conflict resolution, treaty enforcement, establishment of a river basin organisation, or construction of joint infrastructure (Mitchell & Zawahri, 2015; Tir & Stinnett, 2012).

To operationalize inter-state conflicts, I draw on the rivalry concept of William R. Thompson and colleagues (Rasler, Thompson & Ganguly, 2013; Thompson, 2001; Thompson & Dreyer, 2010).

In this understanding, rivalries are persistent, rather long-term conflicts between two states. These states “must regard each other as (a) competitors, (b) the source of actual or latent threats that pose some possibility of becoming militarized, and (c) enemies” (Thompson, 2001: 560) in order to be classified as a rival dyad. Rivalries start when the political elites of two states begin to perceive each other as threatening, or when these elites conceive both states as competing for a valuable good (e.g., territory or political influence). Rivalries can end if one state is no longer capable to continue the rivalry (loss of competitive status).

More relevant in the research on environmental peacemaking is the termination of rivalry by reconciliation, which is used as the dependent variable in this study. Reconciliation is defined as “the downscaling of enemy threat perception” of political elites by non-coercive means and can be brought about by negotiations, leadership changes or “shifts in strategic priorities” (Rasler, Thompson & Ganguly, 2013: 8). The concept of reconciliation employed here is hence closer to the idea of “changing the strategic climate” (Conca, 2002: 10) than to more comprehensive definitions of reconciliation as the redefinition of in-group-out-group identities of wider constituencies (Kelman, 2004; Millar, 2012) or “a change of [broader] societal beliefs” (Bar-Tal, 2000: 356).

Using Thompson’s concept of rivalry has four particular advantages in the context of this study: First, it is in line with some of the constructivist theoretical assumptions outlined in section 2 as it is based on perceptions of threat, competition and enmity. Second, it captures long-term conflict relations between states rather than sporadic clashes covered by the militarized inter-state dispute (MID) dataset (Palmer et al., 2015). This enables me to assess the peacemaking rather than just the violence preventing effect of CEAs (Barquet, Lujala & Rød, 2014; Mitchell & Zawahri, 2015). Third, it accounts for persistent inter-state conflicts that are not characterized by frequent military violence (which is not the case for alle rivalry data, see e.g. Klein, Goertz & Diehl, 2006). And fourth, it allows me to utilize the rich set of empirical data Thompson and colleagues (2010) have collected.

Still, the concepts and data of Thompson and his colleagues are criticized - for example for relying on rather subjective perceptions of threat and enmity, for confusing isolated conflicts and rivalries, for not including less severe rivalries, and for setting high thresholds for rivalry termination (Klein, Goertz & Diehl, 2006). The latter two criticisms are especially relevant in the context of this study. One could argue that because the data of Thompson and colleagues over-represent severe rivalries and under-represent rivalry termination, a study using this data is a particular hard test of the environmental peacebuilding approach discussed above.

4 Statistical analysis

Table 1 provides descriptive statistics on international rivalries and CEAs. 118 rivalries have been recorded worldwide for the period 1946-2010, 59 of which ended by reconciliation (50%). The region with the most rivalries (41) and reconciliations (25) is Africa. 16 dyads (14%) experienced the conclusion of at least one CEA while the rivalry was still active. In order to account for reverse causality (CEAs being a part or consequence of wider peace processes), dyads in which the CEA was concluded in the year of rivalry termination are not considered as cases with CEAs during the (active) rivalry period.

As the last three rows of Table 1 illustrate, two out of 59 reconciliations (3%) took place in the year after a CEA had been concluded. This number rises to 10% if a time lag of one to five is used, and to 12% when considering all cases where a CEA was followed by reconciliation (indefinite time lag). The vast majority of these potential environmental peacemaking cases is located in Africa, and none can be identified outside Africa and Latin America. All positive cases, and in fact the conclusion of all but two CEAs in an active rivalry, took place after 1972, when environmental challenges started to play a more prominent role in international politics following the UN Conference on the Human Environment.

Table 1 around here

This suggests that reconciliation following the signature of CEAs is limited to a medium number of cases in Africa and Latin America. But it tells little about the links between CEAs and reconciliation per se. I thus calculate the odds ratios (OR) to find out whether concluding a CEA has an impact on the likelihood of reconciliation between rival states. I create three datasets to reflect uncertainty about how long processes of environmental peacemaking after CEAs need to show substantial effects:

- a) A dyad-year dataset for the period 1946-2010. In order to account for endogeneity, the CEA variable was lagged by one year in order ensure that the CEA preceded reconciliation.
- b) A dataset containing (i) all five-year periods (lustrums) starting one year after the conclusion of a CEA in a rival dyad as well as (ii) all remaining five-year rivalry periods.
- c) A dataset of all rival dyads containing information about (i) whether reconciliation took place in the dyad and (ii) whether a CEA was concluded any time prior to the reconciliation (118 entries).

Table 2 shows the results of this analysis. The ORs are generally larger than one and are significant for the dyad-year and especially dyad-lustrum data, but not for the dyad-rivalry period data. Results

are stable for the whole sample and for the sub-sample of African and Latin American rivalries. This suggests that CEAs facilitate reconciliation in international rivalries, but only in the first five years after their conclusion. While this period might seem too short for a spill-over of cooperation and processes of trust building to occur, one should keep in mind that the negotiation of a CEA often already involves significant interaction between the respective states (Martin et al., 2011).

Table 2 around here

Even though the ORs indicate a positive link between the conclusion of a CEA and reconciliation, this link is far from unequivocal. When using five-year periods as the unit of analysis, which produced the most significant results, there are ten (out of 16) rivalries and 14 (out of 20) lustrums where the conclusion of a CEA did not correlate with reconciliation. Therefore, the findings suggest that a positive impact of CEAs on reconciliation between rival states is dependent on the presence of scope conditions. This result is well in line with the literature, as all studies finding at least some success of environmental peacemaking approaches specify a number of enabling context factors, such as the absence of recent violence between the rival parties (Akcinaroglu, DiCicco & Radziszewski, 2011), third party mediation (Mackelworth, 2012), or supportive discursive contexts (Ide & Fröhlich, 2015; Zikos, Sorman & Lau, 2015).

5 Qualitative comparative analysis

Based on the insights from the last section, I now investigate under which conditions CEAs facilitate reconciliation between rival states. In order to do so, I utilize the method of qualitative comparative analysis (QCA) to analyze the data on CEAs and inter-state rivalries discussed in section 3. QCA is a set-theoretic method based on Boolean algebra commonly used to detect whether a (combination) of causal conditions are necessary or sufficient for a certain outcome (Legewie, 2013). The method is based on the assumptions of “equifinality” and “conjunctural causation” (Schneider & Wagemann, 2012: 5-6). This implies (i) that the same outcome can be produced by multiple pathways and (ii) that a single condition might have an effect on an outcome only if other conditions are present or absent (Thiem & Baumgartner, 2016). The ability to detect conjunctural causation makes QCA especially suitable to assess context-dependent effects of CEAs on reconciliation. However, QCA is also criticized for the necessity to calibrate the original data and for a lack of proper robustness tests (Hug, 2013), though such criticisms are contested (de Meur, Rihoux & Yamasaki, 2009; Skaaning, 2011)

This study employs the binary, crisp-set version of QCA¹ to detect whether a certain set of conditions is necessary or sufficient for CEAs to facilitate reconciliation between rival states. I focus on Africa and Latin America as these are the only regions with positive cases (see Table 1) and the ORs are largest for the African/Latin American subsample (see Table 2). Further, I choose the five-year period after the conclusion of a CEA as the unit of analysis because this choice produced the most significant statistical results. For the period 1946-2010, twenty five-year periods (lustrums) after the conclusion of CEAs in rivalries can be identified (see appendix 3 for the full list of cases and the replication data for the QCA).²

Existing studies recommend including four causal conditions into an analysis of twenty cases. When using six or more conditions, there is a danger that the truth table analysis identifies patterns in arbitrary data. The inclusion of a fifth causal condition is on the borderline and will thus only be used for robustness tests in this study (Marx & Dusa, 2011). Below, I explain the choice of the four main causal conditions and how they are calibrated as present (1) or absent (0) for the twenty lustrums:

- a) Environmental attention (*envatt*): When attention to and concerns about environmental challenges are high, social groups in the rivaling states (e.g. publics, administrative and political elites) and international actors (e.g. donors, mediating third parties) are more likely to support joint efforts to address such challenges politically and financially. Such support, in turn, makes a widening and deepening of cooperation after the signature of a CEA, and hence environmental peacemaking, more likely (Akçalı & Antonsich, 2009).³ Many observers consider the 1987 Brundtland Report (followed shortly by the Montreal Protocol in the same year and the Earth Summit in 1992) as a turning point in international attention to environmental issues (Zürn, 1998). Hence, all five-year periods overlapping with the period 1987-2010 are calibrated as being characterized by higher environmental attention.
- b) Political instability (*instab*): According to the rivalries literature, internal political instability might changes the balance of power in a given country towards groups less inclined to sustaining the rivalry (Rasler, Thompson & Ganguly, 2013). But research on environmental peacemaking emphasizes that political instability complicates continuous communication, further cooperation and trust building between the decision makers of two states, (Ali & Watzin, 2013; Kibaroglu & Scheumann, 2013). According to this logic, political instability in one or both rival states should inhibit reconciliation after the conclusion of a CEA. For

¹ Fuzzy-set QCA is not possible given that the outcome of interest is binary structured (reconciliation or non-reconciliation).

² A shorter time period is used if reconciliation occurs less than five years after the conclusion of a CEA.

³ This theoretical argument is further strengthened by the empirical point that no potential positive cases occur before 1972, when international environmental attention rose.

the calibration, I define political instability as a change of the polity2 score of at least one rival by at least five points during the five-year period under consideration. Data are obtained from the polityIV project (Marshall, Jaggers & Gurr, 2016). The robustness of this calibration is tested further below.

- c) Agreement type (*agrtyp*): Different types of CEAs might have diverse impacts on reconciliation. For instance, even after the conclusion of cooperative water agreements, further cooperation can be impeded by distributional conflicts about freshwater resources (Cascão, 2008). Cooperation following TBPA, by contrast, often (though not always, see Büscher & Schoon, 2009) involves fewer distributional conflicts (Ali, 2011). In order to account for potential differences between agreement types, I calibrate all lustrums following cooperative TBPA as 0 and all lustrums following cooperative freshwater agreements as 1.
- d) Military conflict (*conf*): Recent military conflicts between two rival states are likely to reduce the reconciliatory effects of CEAs because security concerns tend to dominate the political agenda in such cases and communication channels can be interrupted (Akcinaroglu, DiCicco & Radziszewski, 2011; Carius, 2006). For the calibration, I consider a recent military conflict to be present if at least one MID between two rival states took place during the post-CEA five-year period. Information on such disputes are collected from the MID4 data (Palmer et al., 2015).

In a first step, I perform the analysis for necessary conditions. No condition passes the commonly accepted consistency threshold of 0.9 (Schneider & Wagemann, 2012: 278). In accordance with the expectation formulated above, the presence of environmental attention, the absence of political instability and military conflict, and the presence of a TBPA (all with a consistency of 0.83) come closest to being necessary conditions for a CEA-reconciliation link.

The main QCA analysis identifies a fairly strong solution formula. The simultaneous (i) presence of high environmental attention, (ii) absence of recent political instability, and (iii) presence of a TBPA (rather than a freshwater agreement) is a sufficient condition for a positive impact of CEAs on reconciliation between rival states. This solution has a consistency of 1.00, which means that it is free of internal contradictions. Its coverage value (0.83) indicates that it explains five of the six cases of reconciliation and all 14 cases of non-reconciliation. Only one case (Tanzania-Uganda, 1978-1979) is left unexplained and will be discussed in greater detail below.

Table 3 around here

In line with established standards (Hug, 2013; Skaaning, 2011), three kinds of robustness tests of the QCA results are conducted. First, alternative calibration strategies for the conditions political instability and environmental attention are employed (Table 4, lines 2-4). Second, various additional variables are included as a fifth causal conditions into the truth table analysis: the level of democracy (*demo*), whether the CEA was bi-lateral or multi-lateral (*bilat*), the trade volume between the two rival states (*trade*), and water scarcity as a measure of environmental stress (*envstr*) (Table 4, lines 5-8). Third, various sets of cases are dropped from the analysis (Table 4, lines 9-11). Table 4 provides an overview about the robustness test and solution formulas yielded, while appendix 3 describes the theoretical assumptions, datasets and calibration procedures used in greater detail.

All ten alternative solution formulas meet established standards of consistency and coverage (Legewie, 2013). Further, the results of the modified analysis indicate a remarkable robustness of the solution formula of the main analysis. The presence of high environmental attention, the absence of recent political instability, and the presence of a TBPA are part of all eleven solution formulas. The robustness of this tripartite sufficient condition provides some further evidence that the conclusion of CEAs and reconciliation are linked if certain context factors are present. Though this is not impossible, a QCA is unlikely to produce a robust solution formula if no such link exists (Marx & Dusa, 2011).

Table 4 around here

The results of the QCA are mostly in line with the formulated theoretical expectations. The post-1987 rise in environmental attention increased the resources available and political will to deepen cooperation after the conclusion of CEAs, which is an essential precondition of environmental peacemaking (Ide & Scheffran, 2014). But high environmental attention is not a sufficient condition on its own. It needs to interact with political stability, which enables stable environmental policies as well as continuous exchanges and trust building between relevant decision makers (Lejano, 2006). This finding is at odds with the rivalries literature, which claims that political instability facilitates rivalry termination (Rasler, Thompson & Ganguly, 2013), and might be a particular characteristic of environmental peacemaking cases.

More surprising is the third part of the sufficient condition for reconciliation after the conclusion of CEAs: the presence of a TBPA. While transboundary freshwater agreements are frequently claimed to be entry points for international cooperation (Feil, Klein & Westerkamp, 2009; Yoffe, Wolf & Giordano, 2003), five or the six positive cases experienced the establishment of TBPAs,

and the only case with a freshwater agreement remains unexplained by all solution formulas (Tanzania-Uganda 1978-1979). Above, I speculated that conservation cooperation faces fewer distributional conflicts than water cooperation, and is hence more likely to stimulate trust building and follow-up cooperation. In addition, one can argue that the political and financial support provided by conservation NGOs (like the Peace Parks Foundation), international donors, the tourism industry, and even the academic community facilitate peacebuilding after cooperative TBPA agreements in the post-1987 period (Ali & Watzin, 2013; Büscher & Schoon, 2009). But the result is still surprising and will be put under critical scrutiny in the case study section.

6 Case studies

In the context of multi-method research in general, and of set-theoretic multi-method research in particular (Schneider & Rohlfing, 2013), case studies can be used for various purposes, three of which are particularly important here. First, they can shed light on contradictory cases. Second, they can check the validity of the causal links indicated by the correlations and solution formulas. And third, they can identify omitted variables (which are especially relevant for future studies). For these three reasons, I briefly analyze the six positive cases (see Figure 1 for an overview) in greater detail.

Figure 1 around here

6.1 Tanzania-Uganda, 1978-1979

The termination of the rivalry between Tanzania and Uganda in 1979 is the only contradictory case that is left unexplained by the QCA solution formula. Reconciliation after the conclusion of a CEA took place before 1987 and in the wake of political instability and regime change in Uganda. But on closer inspection, one can cast doubt whether the case really experienced a CEA and reconciliation. First, the CEA under consideration is the Kagera Basin Organization (KBO). It aimed to protect the Kagera River (which is also a crucial source of water for Lake Victoria) and to facilitate economic development. But while Tanzania established the KBO together with Burundi and Rwanda in 1977, Uganda only had an observer status until 1981 and was hardly involved in water-related cooperation prior to the end of the rivalry (Mbaziira, Senfuma & McDonnell, 2005; Phillips et al., 2006). In other words, no significant environmental cooperation took place between Tanzania and Uganda prior to the reconciliation.

Second, the rivalry was ended by a Tanzanian military intervention ousting the Amin government in Uganda and facilitating the election of a democratic, pro-Tanzanian regime (Thompson &

Dreyer, 2010: 245-246). This is hardly the transformation of enemy images by cooperation and trust building envisioned by the environmental peacemaking approach outlined in sections 2 and 3 (and does hardly meet the definition of reconciliation of Thompson and colleagues either). Tanzania-Uganda in 1978/1979 is hence not a contradictory positive case, but rather a confirming negative case for the CEA-reconciliation link specified in the previous sections.

6.2 Mauritania-Senegal, 1995

Towards the end of the short Mauritanian-Senegalese rivalry (1989-1995), Mauritania formally declared the Diawling National Park in 1994, which formed a TBPA together with the Djoudi National Bird Sanctuary established at the opposite side of the Senegal River in 1981. “The management of both parks quickly expressed their wish to collaborate” (Vasiljević et al., 2015: 18), but talks were infrequent and the level of cooperation remained very low. The impact of this TBPA, especially when compared with other factors like regional economic integration or agreements about the return of refugees (Thompson & Dreyer, 2010: 228f.), was very minor.

However, the establishment of a TBPA along the Senegal River must be considered in the wider context of meaningful environmental cooperation around this very river. Replacing earlier water-related agreements, the governments of Mali, Mauritania and Senegal established the Senegal River Development Organisation (OMVS) in 1972. The OMVS was characterized by intense transnational water cooperation, including the joint construction and management of two dams to reduce the impacts of regional droughts. Cooperation survived the 1989-1991 war between Mauritania and Senegal, and various studies claim that it contributed to the promotion of interdependence, understanding, and peaceful relations between both states (Kipping, 2009; Tignino, 2016).

So while the 1994 TBPA had little impact on wider inter-state relations, it can be interpreted as part of a larger process of cooperation on the Senegal River, which helped to improve relations between Mauritania and Senegal and thus eventually facilitated reconciliation. Support by international donors (whose engagement can be read as an expression of increased environmental attention following the Sahelian droughts) and political stability in both countries (which enabled the building of trustful relations and further cooperation) were crucial context factors for these environmental peacemaking dynamics (Tignino, 2016).

6.3 DR Congo-Rwanda-Uganda, 2005-2009

As the environmental cooperation and rivalry dynamics between DR Congo, Rwanda and Uganda were essentially trilateral, they are discussed as one case here. From the mid-1990s onwards,

relations between the three states became tense in the context of regional power struggles, Rwandan and Ugandan interventions into the DR Congo, and transboundary attacks by various rebel groups (Thompson & Dreyer, 2010: 231-233).

The border area between all three countries, known as the Virunga Massif, is rich in biodiversity and hosts, among others, one of two remaining populations of mountain gorillas worldwide. In the early 1990s, largely technical cooperation between the protected area authorities as well as joint patrols between rangers from different countries took place. This cooperation continued even during the Rwandan genocide (1994) and the most violent phase of the Congo War (1998-2003). These interactions paved the way for more formal cooperation in the mid-2000s. Between 2004 and 2008, DR Congo, Rwanda and Uganda signed a number of inter-ministerial declarations and agreements regarding the integrated transboundary management of the Virunga Massif, the sharing of related revenues, and the promotion of tourism (Martin et al., 2011; Refisch & Jensen, 2016).

Once mainly conducted by protected area staff and international NGOs, a continuous widening and institutionalization of environmental cooperation took place between the establishment of a TBPA in 2005 and the termination of the rivalry in 2009. Martin et al. (2011) warn that relations between such cooperation and security politics are quite complex, but still conclude that conservation cooperation facilitated the building of trust and understanding between the DR Congo, Rwanda and Uganda. This impact was enabled by the improvement of relationships between and of political stability within the three states as well as by the support of international donors (which were well aware of the ecological relevance and environmental stress in the Virunga Massif).

Overall, an impact of the TBPA and related processes of cooperation on reconciliation can be claimed, though it was clearly limited. Most conservation activities were poorly financed and did not neatly fit the three governments' top priorities, such as post-conflict reconstruction, economic development, and the consolidation of the security situation (Hammill & Crawford, 2008; van de Giessen, 2005). Agreements on economic cooperation and joint operations against rebel groups likely had a bigger impact on reconciliation (Thompson & Dreyer, 2010: 231-233).

6.4 El Salvador-Honduras, 1992

The rivalry between El Salvador and Honduras started in the 1840s, shortly after both states gained independence, and was mainly driven by territorial disputes. In the context of economic crises, increasing internal political stability and democratic transitions, but also facilitated by several well-crafted regional mediation efforts, both countries improved their relations during the 1980s. They

submitted a request to the International Court of Justice to resolve their border disputes. The 1992 judgement was accepted by both states, thus ending the rivalry (Thompson & Dreyer, 2010: 140f.). The border area between El Salvador and Honduras as well as Guatemala is known as the Trifinio Region. It is not only characterized by valuable ecosystems, but it is also the head of three important rivers, the Lempa, the Motagua, and the Ulúa. In 1986, the Trifinio Plan to promote social development, peace and environmental protection in the region was launched (Artiga, 2003). Building on earlier Central American efforts to cooperate on environmental issues, El Salvador, Honduras and several other states also established the Central American Commission for Environment and Development (CCAD). In 1991, a TBPA in the Trifinio Region was established. Cooperation around the Trifinio region as well as in the CCAD helped to move transboundary environmental cooperation from rather technical to more substantive and political activities in the late 1980s and 1990s. Such activities included meetings at the ministerial and presidential level, transnational efforts to conserve the environment of and develop the Trifinio region, and the harmonization of environmental legislation (King et al., 2016; López, 2004).

Almost all analysts agree that the Trifinio Plan, the Trifinio TBPA and related forms of environmental cooperation facilitated reconciliation between El Salvador and Honduras, although a process of conflict resolution was already under way since the early 1980s (Artiga, 2003; Miranda, Slowing Umaña & Raudales, 2010). According to Lopez (2004: 18), such cooperation “changed the manner in which its stakeholders interact. Coordination and communication between the three governments has increased substantially [...] it was instrumental in developing the idea of a more closely integrated Central America.” This impact of CEAs on reconciliation was facilitated by increasing concerns about environmental challenges in Central America during the 1980s and increased internal political stability in that permitted continuous cooperation between El Salvador and Honduras (Artiga, 2003; King et al., 2016).

6.5 Discussion

The case studies provide further support for the results of the statistical analysis and the QCA in at least three respects. First, the causal links indicated by the statistical analysis and the QCA can be confirmed. Environmental peacemaking took place after the signature of a CEA in the cases of Mauritania-Senegal, DR Congo-Rwanda-Uganda, and especially El Salvador-Honduras. Second, the cases studies underline the relevance of two of the three INUS conditions identified by the QCA: Internal political stability facilitates continuous cooperation and the build-up of trust and understanding between the rival states, while cooperation in the context of CEAs is buttressed by increasing environmental concerns of internal constituencies and external donors. Third, the case

unexplained by all QCA solutions, Uganda-Tanzania (1978-1979), is no contradictory case as it hardly experienced the conclusion of a CEA or reconciliation.

But these case studies also refine the results of the QCA and the statistical analysis. Three aspects are especially relevant again. First, though environmental cooperation in the context of a CEA facilitated reconciliation, it was by no means the most important driver. In line with the results of other cases studies (Barquet, Lujala & Rød, 2014; Kelman, 2012; Swain, 2016), I find that environmental cooperation strengthens (or “locks in”) existing dynamics of reconciliation, rather than creating new ones. Second, at least one omitted variable can be identified from the qualitative studies. In all cases of reconciliation after the conclusion of a CEA, the CEA was part (and result) of broader and long-term efforts to cooperate on environmental challenges. This highlights the importance of traditions and larger processes of environmental cooperation beyond a single CEA. Finally, cooperation on TBPA was closely related to water issues in the cases of Mauritania-Senegal (Senegal River) and El Salvador-Honduras (Lempa River). This casts doubt about the QCA result that the conclusion of CEAs on conservation, but not on water, tends to facilitate reconciliation (in conjunction with other factors).

7 Conclusion

In this article, I present the results of one of the first cross-case, multi-method studies on environmental peacemaking. Various authors claim that environmental peacemaking is a well-crafted idea, but has little impact in practice and should be seen as a dependent rather than an independent variable in international politics (e.g. Aggestam & Sundell-Eklund, 2014; Barquet, 2015; Brock, 1991; van Amerom & Büscher, 2005). This study, by contrast, provides some support for the environmental peacemaking approach. Such a finding is especially remarkable because my analysis draws on rivalry data from Thompson and colleagues, which tend to exclude minor rivalries and to set high thresholds for reconciliation (Klein, Goertz & Diehl, 2006).

Triangulation of results from the statistical analysis, the QCA and the cases studies shows that the conclusion of CEAs facilitates reconciliation in international rivalries. But all three analyses also qualify such a CEA-reconciliation link. The statistical analysis shows that CEAs are only concluded in a medium number of (exclusively African or Latin American) rivalries, and that their effect is most salient in the first five years after they are concluded. Further, according to the robust solution formula produced by the QCA, the conclusion of a CEA can only have a positive impact on reconciliation if attention to environmental challenges is high (indicated by the post-1987 period) and both states are characterized by internal political stability. And finally, the case studies

reveal that CEAs only have such a positive effect when they are embedded into (i) wider patterns or traditions of environmental cooperation and (ii) already ongoing reconciliation processes.

The findings leave room for, and indeed provide several inspirations for future research on environmental peacemaking. This study focuses on CEAs, but negotiations and joint activities prior to the conclusion of a CEA in the cases of El Salvador-Honduras and DR Congo-Rwanda-Uganda show that less formalized versions of environmental cooperation can also have an impact on reconciliation (Artiga, 2003; Martin et al., 2011). The long-term effects of such cooperation, and how they might interact with the conclusion of more prominent environmental agreements in facilitating peacemaking, deserves further attention.

For instance, one can argue that long-term secret water discussions between Israel and Jordan helped to build trust between the parties and thus contributed to the establishment of a peace treaty and a water regime in 1994 (Ide, Sümer & Aldehoff, in press). However, the first formal water treaty between both states was part of the peace treaty ending the rivalry, and hence, Israel-Jordan was not considered as an environmental peacemaking case in this study. A greater focus on the agency of individual actors, such as conservation NGOs and heads of state in Central America (Barquet, 2015; King et al., 2016), and their capacity to influence peacemaking dynamics is also warranted.

Further, CEAs and other forms of environmental cooperation could also facilitate reconciliation in lower-level disputes that fail to reach the intensity level of a rivalry. For example, cooperation on international rivers in the 1990s had a positive impact on India's relationships with Bangladesh and Nepal (Swain, 2002). In a similar manner, environmental cooperation might help to improve the relationship between rivals, even if no full-scale reconciliation takes place. The Mekong Committee established in 1957, for instance, had no reconciliatory impact on rivalry dynamics, but provided Cambodia, Laos, Thailand and Vietnam a forum to communicate and cooperate even in times of regional instability and war (Jacobs, 2002). Finally, my analysis considers only inter-state relations, while several promising dynamics of intra-state environmental peacemaking have been identified, for instance in local-level conflicts in Ethiopia (Bogale & Korf, 2007), Israel (Tubi & Feitelson, 2016) or Kenya (Linke et al., 2015).

Despite the clear need for further research, the results of this study provide some ground for optimism. Under specific circumstances, CEAs have a positive effect on (already ongoing) reconciliation processes between rival states. This implies that the tremendous environmental challenges of our time do not only affect peace and security in a negative way (Hsiang, Burke & Miguel, 2013; von Uexkull et al., 2016). Addressing them cooperatively also opens opportunities for cooperation, trust building, reconciliation and peacemaking.

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