VIOLENT NATURAL RESOURCE CONFLICTS: DEFINITIONS, FRAMEWORKS, AND MODELLING TOWARDS PREVENTION

EBA

Violent Natural Resource Conflicts: Definitions, Frameworks, and Modelling Towards Prevention

Marie Schellens

Marie Schellens is an environmental researcher at PAX for Peace, an international civil society organisation based in the Netherlands, working for peace, reconciliation and justice.

Before joining PAX, she worked as an environmental security analyst at the UN Environment Programme.

From 2016 to 2020, she was a Marie Curie PhD fellow at Stockholm University and the University of Iceland, researching the role of natural resources in conflict risk.

She holds an MSc in Geography jointly from KU Leuven and Free University Brussels (Belgium, 2015).

This report summarizes the findings from the doctoral dissertation *Violent Natural Resource Conflicts: From Definitions to Prevention*, defended in October 2020 (Schellens, 2020).

Table of Contents

Sammanfattning

Trots konsensus om att naturresurser ofta spelar en viktig roll vid våldsamma konflikter, kämpade man inom forskningen med att reda ut vilka sociala och miljömässiga mekanismer som bidrar till konflikter. Därför var det övergripande syftet med den här avhandlingen att främja förståelsen av mekanismerna bakom naturresurskonflikter, för att mer effektivt kunna förebygga sådana konflikter. Viktiga slutsatser inkluderar:

- Befintliga beskrivningar av "kritiska naturresurser" överbetonar natur-resursers ekonomiska betydelse på bekostnad av deras bidrag till ekosystemet och det sociokulturella värdet.

- En ny, holistisk definition av "kritiska naturresurser" avseende betydelsen för såväl ekonomi, miljö, ekosystem och klimat som för sociokulturella värden.

- Bekräftelse av vikten av att inkludera naturresurs-variabler när man försöker förutsäga konflikter numeriskt.

- För att vända onda cirklar av konflikt till goda cirklar av fred är det nödvändigt att:

  - Förbättra staters och institutioners förvaltning av naturresurser, att balansera tillgång och efterfrågan på resurser, att begränsa tvångs-förflyttningar och att säkerställa att människor har adekvat försörjning;

  - Resursexploatering och dess beskattning, miljövård och miljö-återställning kan verka stabiliserande och fredsbevarande.

Det sista avsnittet diskuterar ny utveckling och trender inom konflikt, miljö och klimat sedan avhandlingens slutförande, som är viktiga att ta hänsyn till när man reflekterar över de resultat som presenteras. Rekommendationer till beslutsfattare sammanfattas i slutsatserna.

Abstract

When this research was conducted in 2016–2020, the consensus was that natural resources play an important role in violent conflicts. Yet, the research community struggled to unravel the precise socio-environmental mechanisms that bring about natural resource conflicts. Therefore, the overarching aim of the thesis was to advance the understanding of mechanisms underlying violent natural resource conflicts towards effective prevention. Key conclusions include:

- Existing descriptions of critical natural resources overemphasize their economic importance at the expense of ecosystem support and socio-cultural functions of natural resources;

- A new, holistic, definition of criticality for natural resources;

- Confirmation of the importance of natural resource variables when numerically predicting conflict, though their effects are often mediated by intervening socio-economic variables;

- Key structural points on the causal paths towards natural resource conflicts, which in theory function towards effective prevention:

    – to reverse vicious circles of conflict to virtuous circles of peace, it is necessary to improve state and natural resource management institutions, balance resource availability and demand, limit forced displacement, and ensure adequate livelihoods;

    – resource exploitation and its revenues, environmental conservation, and environmental restoration can stabilize peaceful situations.

The last section discusses trends in the field of environmental security since the finalisation of the dissertation, important to take into account when reflecting on the presented results. Recommendations for policymakers are summarized in the conclusions.

1   Background and rationale

1.1   Growing awareness of natural resource conflicts in a drastically changing natural environment

The drastic environmental degradation that we are experiencing is projected to continue with many pressures accelerating (UNEP 2019). Increased per capita consumption, population growth, and global economic growth have expanded the extraction of natural resources and exhausted the environment's capacity for absorbing or remediating wastes and pollution (Krausmann et al. 2013; Steffen et al. 2015). The implications of these pressures on the environment, including land use changes, biodiversity loss, and climate change, have risen to alarming levels (IPCC 2014; IPBES 2019). Additionally, interdependencies between resources, the so-called resource nexuses, have deepened, for example, because of new technologies, more unconventional and resource-intensive production processes, and the expansion of resource extraction and production to more vulnerable areas (Bleischwitz et al. 2018). For their livelihoods, 70 per cent of the global population directly depends on natural resources extracted from a drastically changing natural environment (UNEP 2019). All livelihoods, economies, and societies, directly or indirectly, critically depend on many natural resources. Increasing pressures and uncertainty from global environmental change, together with the highly interdependent resource nexuses, have increased the criticality of many natural resources that support us (Bleischwitz, Johnson, and Dozler 2014). Therefore, it has become increasingly challenging to manage natural resources sustainably and to distribute their benefits equitably.

At the time of writing the dissertation, the scientific consensus was growing that natural resources play an important role in violent conflict. Figure 1 maps out the major inter- and intrastate armed conflicts (over 999 battle-related

deaths in a year) that involved natural resources between 1990 and 2015 (Bruch et al. 2019). According to the Heidelberg Institute's conflict data, natural resources, or the profits they generate, were a contested issue between the opposing actors in 99 out of 374 recorded violent crises and conflicts from 2014 to 2018 worldwide (26%) (HIIK 2019). Resources have contributed to conflicts in many different ways, aligning with major historical developments (Scholvin 2016; Beevers 2019; Bruch et al. 2019). During colonial times, dominated regions were used to supply raw materials to the dominating powers, which used them for industrial development (Amin 1977). The plunder continued after colonial rule ended, taking the shape of neo-colonialism and tension between core and periphery against the backdrop of the Cold War (Amin 1977). After the end of the Cold War's proxy-war funding, revenues from resource exploitation replaced the funding of armed conflicts (see lower map of Figure 1), which had changed in character toward intrastate conflicts in failed or failing states, such as civil wars and intractable conflicts involving non-state actors (Sachs and Warner 2001; Beevers 2019; Bruch et al. 2019). An abundance of resources also presented serious governmental challenges to avoid grievances over the unequal distribution of revenues, shown in the upper map of Figure 1 (Collier and Hoeffler 2004; Le Billon 2012). Simultaneously, in the 1990s, the field of environmental security developed amid a growing global awareness of ecological and sustainability issues (Beevers 2019; Bruch et al. 2019). Environmental security was introduced to the study of international relations as one of five security sectors, widening the understanding of security (Buzan, Wæver, and de Wilde 1998). The securitization of the environment meant that environmental issues were conceptualized as a security threat, legitimising more extreme interventions than standard political processes (Buzan, Wæver, and de Wilde 1998). Earlier works on environmental security showed how natural resource scarcity and unsustainable natural resource use could, directly and indirectly, lead to violent conflict where communities are dependent on the natural resources for their

livelihoods, mapped in the upper part of Figure 1 (Homer-Dixon 1994; Barnett and Adger 2010). Nonetheless, what is regarded as a "sustainable" use of natural resources can lead to conflict too. Undesirable social impacts of mining minerals and metals for low-carbon technologies have raised security concerns surrounding mitigation and adaptation to climate change (Mirumachi, Sawas, and Workman 2020; Sovacool et al. 2020).

Earlier theories explaining natural resources as drivers of conflict refer to 'too little' vs. 'too much' resources, i.e. their relative scarcity or abundance (Mildner, Lauster, and Wodni 2011). The unequal distribution of burdens and benefits, profits and power generated from resource exploitation is the direct socio-economic and political context that creates resource grievances (e.g. Must 2016; Lessmann and Steinkraus 2019). Without strong agreements on the access to, and the management of, natural resources, disputes and competition can develop into violent conflicts (e.g. Must 2016; Olsson and Gooch 2019b).

Figure 1: Major inter- and intrastate armed conflicts between 1990 and 2015 that involved natural resources
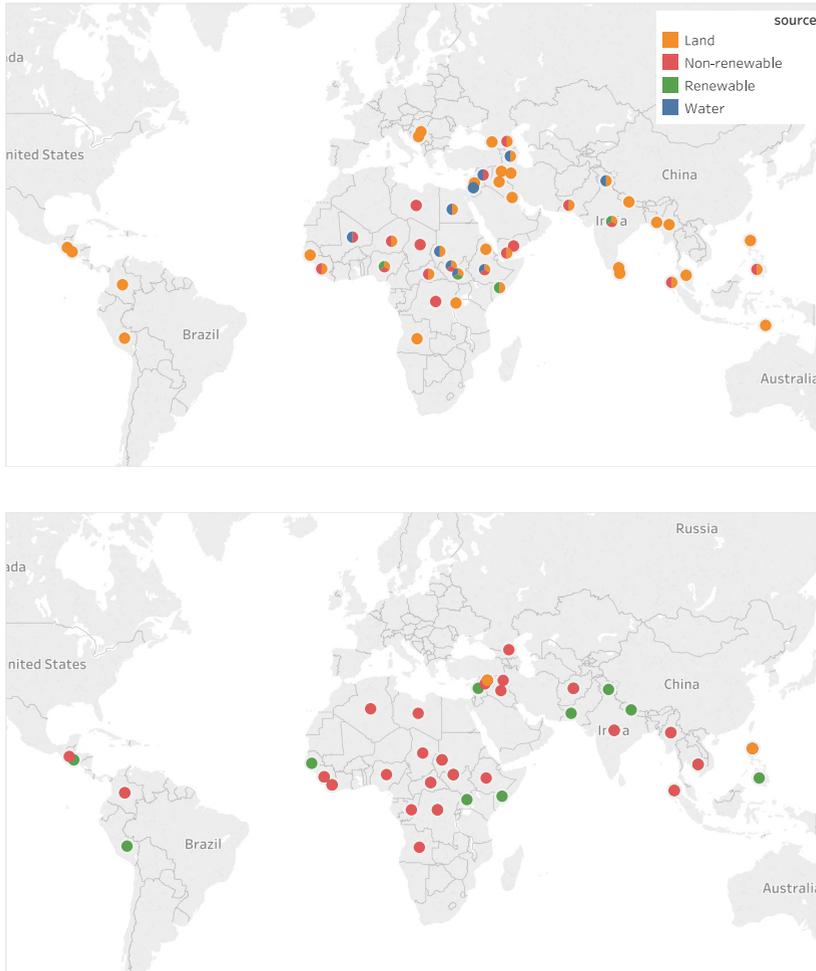
Source: Bruch et al. 2019; Figure source: Schellens and Diemer 2020.

1.2   Research gaps

Although the importance of natural resources in violent conflicts was difficult to deny, there was no scientific consensus when I started my PhD research on the mechanisms of how natural resources contributed to violent conflicts. The statistical evidence of both scarcity and abundance of natural resources leading to violent conflicts remained contested in many studies (Koubi et al. 2014; O'Brochta 2019). One important reason for this lack of statistical evidence is that direct cause-effect relations between natural resource abundance and violent conflict are hard to identify empirically, and researchers argue for a more nuanced study of the causal relation (O'Brochta 2019). Many socioeconomic and political variables are confounded in the effects of natural resources on conflicts, such as technological innovations, cultural diversity (ethnic, linguistic or religious), substitutable resources, colonial legacy, trade, health impacts, revenue distribution, the quality of governance, and population displacement (Mildner, Lauster, and Wodni 2011; Koubi et al. 2014; Ross 2015; Schilling, Saulich, and Engwicht 2018). Statistical studies, as well as qualitative case studies on violent natural resource conflicts, are often criticised for their choice of cases, unreliable data from conflict areas, and difficulty in generalising results (Gleditsch and Urdal 2002; Selby et al. 2017; Adams et al. 2018).

However, more and more statistical evidence of climate change's impact on natural resources, livelihoods and violent conflict is countering parts of this criticism and supporting resource scarcity theories (von Uexkull 2014; Ide 2018; Abel et al. 2019). Therefore, climate change is now generally accepted as a threat multiplier for violent conflicts (ibid.).

Instead of scarcity or abundance, some studies relate the criticality of natural resources to conflicts (e.g. Unruh 1995; Bleischwitz, Johnson, and Dozler 2014; Gulley, Nassar, and Xun 2018). Although widely used, the concept of criticality remains undertheorized, with few, but diverging, definitions and frameworks

that describe it (Jin, Kim, and Guillaume 2016). Findings regarding different types of resources show evidence of different causal pathways to violent conflicts, with different roles in the socioeconomic and political context (Ross 2015). There is a lack of general theories that explain how specific characteristics of natural resources, e.g. their market value, their location compared to centres of power, their ownership, their ease of extraction and transport, etc., lead to different conflict outcomes (Ross 2015).

Consequently, direct cause-and-effect relationships cannot describe natural resources' role in violent conflicts; instead complex socio-environmental interactions are required to unravel the mechanisms and conditions under which violent natural resource conflicts occur (Scheffran et al. 2012; Bayramov 2018; Bruckmeier 2019). Complex socio-environmental systems capture the inter-linked nature of societal and environmental processes, "characterized by complex feedbacks on different spatial and temporal scales" (Widlok et al. 2012, 260). Current stresses impacting natural resources heighten the urgency for a comprehensive socio-environmental understanding of complex natural resource-conflict relations (Matthew 2010; Scheffran et al. 2012).

1.3 The relevance of natural resource conflicts to international development cooperation

Practitioners and policymakers have recognized the link between natural resources and violent conflicts, and have incorporated natural resource management in their programmes for conflict prevention and peacebuilding (Beevers 2019). In 2006, then Secretary General of the UN, Kofi Annan, stated that "environmental degradation in forms such as desertification, resource depletion and demographic pressure exacerbates tensions and instability" (UN General Assembly 2006). In 2008, two large international programmes were initiated with the aims to build the capacity of countries and organisations

alike to understand, prevent, and resolve natural resource conflicts; the EU-UN Partnership on Land, Natural Resources and Conflict Prevention (UNFT, 2011) and the Environmental Cooperation for Peacebuilding Programme (UNEP 2016). In 2010, the "Conflict Minerals Provision" was passed by the US Congress under the Dodd Frank Act. This law ensures that US-listed companies have to report and ensure that tin, tungsten, tantalum and gold within their supply chains do not contribute to conflict in the Great Lakes region in Africa (Koch and Burlyuk 2019). The Intergovernmental Panel on Climate Change (IPCC) included a chapter on human security for the first time in their Fifth Assessment Report (Adger et al., 2014). In 2021, the EU Conflict Minerals Regulation entered into force (Koch and Burlyuk 2019; European Commission 2021). Lastly, Search for Common Ground, the largest peacebuilding NGO worldwide, has actively incorporated natural resource management in its on-the-ground peacebuilding programmes since 2014 (Search for Common Ground 2019).

Despite the high awareness of researchers, policymakers, and practitioners on natural resource conflicts, there are only a few studies on interventions in natural resource management for conflict prevention and peacebuilding (Beevers 2019). The few existing studies reported limited effectiveness of such interventions because of unintended negative consequences that undermined the potential of natural resources to support peace (Cuvelier, Vlassenroot, and Olin 2014; Beevers 2019; Stoop, Verpoorten, and van der Windt 2018; Koch and Burlyuk 2019). For example, after the implementation of the Dodd-Frank Act, a de-facto boycott emerged around mineral imports from the Great Lakes region, which compromised the economic and peacebuilding value of those minerals (Koch and Burlyuk 2019).

2   Research aims and questions

The overarching aim of this thesis was to advance the understanding of
mechanisms underlying violent natural resource conflicts towards effective
prevention. This thesis focuses on violent natural resource conflicts within
states since 1989, because with the end of the Cold War, the character of armed
conflicts turned increasingly intrastate. The following research questions were
developed and investigated:

1. What constitutes critical natural resources?

2. Are natural resources and violent conflicts related quantitatively, after
    considering their complex socioeconomic and political contexts?

3. What are the core socio-environmental causal pathways linking natural
    resources and violent conflicts?

4. What opportunities are available to prevent violent conflict related to
    resource use?

2.1   A multi-methods approach

The research questions pose several specific requirements for the research
methods used in this thesis.

*   The methods need to build on existing theories of natural resource
    conflicts.

*   The methods need to use quantitative empirical data.

*   The methods need to capture complex, multidimensional socio-
    environmental pathways linking natural resources and violent conflicts.

*   The methods need to provide science-based, practically relevant outcomes
    for policy-making.

No single clear-cut tool adheres to all these requirements. Different methods provide answers only to certain research questions and adhere only partly to the requirements. Therefore, a multi-method approach was applied, including systematic literature reviews, open coding of text data, quantitative predictive modelling (statistical and machine learning), causal network mapping, and network analysis. The methods applied in studies of natural resource conflicts have been innovated and extended in recent years (Ide 2017). Many researchers have seen the benefits of and recommend the use of multiple methods to study natural resource conflicts (Doolittle 2015; Gamu, Le Billon, and Spiegel 2015; Ide 2017; Song et al. 2017).

2.2 About complex socio-environmental systems and terminology in the environment-conflict nexus

Natural resource conflicts are considered complex socio-environmental systems (Scheffran et al. 2012; Bruckmeier 2019). A system is a set of units, elements, actors and/or subsystems that are highly interconnected on various scales (Vicsek 2002). "Socio-environmental" means that the system under study includes components from societal, human-related spheres and from environmental, bio-geophysical spheres, as well as the interactions between the components of those spheres (Musters and de Graaf 1998). In the context of natural resource conflicts, the studied system includes among others ecological subsystems, with their processes of regeneration, and societal structures such as "class structures, societal division of labour, political and economic power relations, socially unequal appropriation and distribution of natural resources" (Bruckmeier 2019, 194).

"Complex" means that the processes and the interactions among the system units result in an overall behaviour that is "qualitatively different from the laws that govern its units" (Vicsek 2002). Many essential effects are indirect –

because of the interconnections – and delayed (Jervis 1997). Results cannot be deduced linearly by extrapolating or summing up these distinct inputs, since the interconnected units interact with each other in, often non-linear, relations leading to emerging system patterns of a qualitatively different sort (Geller 2011; Jervis 1997; Rosenau 1999). Complex socio-environmental systems, thus, capture that societal and environmental processes are interlinked, "characterized by complex feedbacks on different spatial and temporal scales" (Widlok et al. 2012, 260).

Natural resource conflicts have been defined as: "A social or political conflict where natural resources contribute to the onset, aggravation, or sustaining of the conflict, due to disagreements or competition over the access to and management of natural resources, and the unequal burdens and benefits, profits, or power generated thereof" (Schellens and Diemer 2020). Other terms used for natural resource conflicts, with slightly different meanings, are environmental conflict, socio-environmental conflict, ecological distribution conflict, and climate conflict. Environmental conflicts distinguish themselves as being induced by human-caused environmental degradation (Libiszewski 1992). Socio-environmental conflicts and ecological distribution conflicts are synonyms, sometimes also seen as synonymous with environmental conflict (Martinez-Alier and O'Connor 1996; Temper et al. 2018). They are described as "social conflicts born from the unfair access to natural resources and the unjust burdens of pollution" (Conde and Martinez-Alier n.d.), placing their main focus on inequality and access. Climate conflicts arise from a change in availability or access to natural resources due to climate change (Mazo 2010; Scheffran et al. 2012) and can thus be considered a sub-type of natural resource conflicts. Although all fairly similar terms, this thesis uses the term 'natural resource conflict' because it explicitly includes conflicts over abundant natural resources next to scarcity or unequal access and because 'natural resources' highlight the value humans attribute to their environment that can potentially initiate social unrest. That value can be economic, cultural, or physical support for livelihoods

and is explained in more detail when defining natural resources in the original dissertation (Schellens 2020) under section 2.2 Resource characteristics in natural resource conflicts. The terms 'resource wars' (Klare 2002) and 'geopolitical conflict' (Song et al. 2017) are most often used in interstate conflict contexts, which is not the focus of this thesis. Therefore, I use 'natural resource conflicts' throughout the thesis as defined above, focusing on violent forms of intrastate natural resource conflicts. Often these intrastate conflicts are in border regions or embedded within an internationalized context.

The multidimensionality and complex behaviour of the system under study could make it difficult and overwhelming to interpret any research results. As handles to deal with the multiple, interrelated aspects of natural resource conflicts, the dissertation presented three analytical axes, or frameworks, that offer different perspectives to interpret the multitude of aspects of the thesis' results; one related to the characteristics of the resources involved; one related to the temporal dynamics of violence and intensity within the conflict cycle; and one related to spatial scales and actors on those scales of natural resource conflicts (Schellens and Diemer 2020). The temporal and spatial scale frameworks have proven very valuable and practical in my years of work since the finalization of the thesis to this present day and are both presented.

2.3   Two frameworks to analyse natural resource conflicts

A holistic perspective is important when studying natural resource conflicts. It is often not just one mechanism leading to violent conflict, but a combination of several interrelated causal mechanisms. Natural resource conflicts are dependent on and embedded within a multitude of non-resource aspects such as marginalisation, history, trust, ethnicity, communication, gender, conflict in neighbouring areas, quality of governance, economic issues, religion, etc. (Gleditsch and Urdal 2002; Bond 2014; UNEP 2009).

Two analytical perspectives are presented: (1) intensity and violence along the (natural resource) conflict cycle and (2) the geographical scales of conflict dynamics over natural resources. The content and structure of the two frameworks are largely based on a peer-reviewed encyclopaedia entry by Schellens and Diemer (2020).

2.3.1   Intensity and violence along the conflict cycle

Natural resource conflicts vary widely in intensity from conflicts of interest between stakeholder groups, over kidnapping and murders, to armed conflicts between population groups (Ratner et al. 2017; Butt et al. 2019; Olsson and Gooch 2019a). It is important to note that conflict is not negative in itself, and "non-violent conflict can be an essential component of social change and development and is a necessary component of human interaction" (UNFT 2011, 7). However, without a constructive process of dialogue, without accepted institutions or societal mechanisms for conflict resolution, natural resource conflicts can escalate into destructive and violent interactions.

Figure 2 plots conflict intensity along the y-axis and the different phases of a conflict along the x-axis, illustrating the tendency to get trapped within the conflict cycle. It also summarizes the different risks natural resources can bring in every phase of the conflict cycle, as well as opportunities for mediating and reducing violent conflict, for peacekeeping, peacebuilding, and long-term peaceful sustainable development (UNEP 2009; UN DPA and UNEP 2015; UNEP 2016; Bruch et al. 2019).

Figure 2: Conceptualisation of conflict intensity (y-axis) throughout the different phases of a conflict (x-axis)
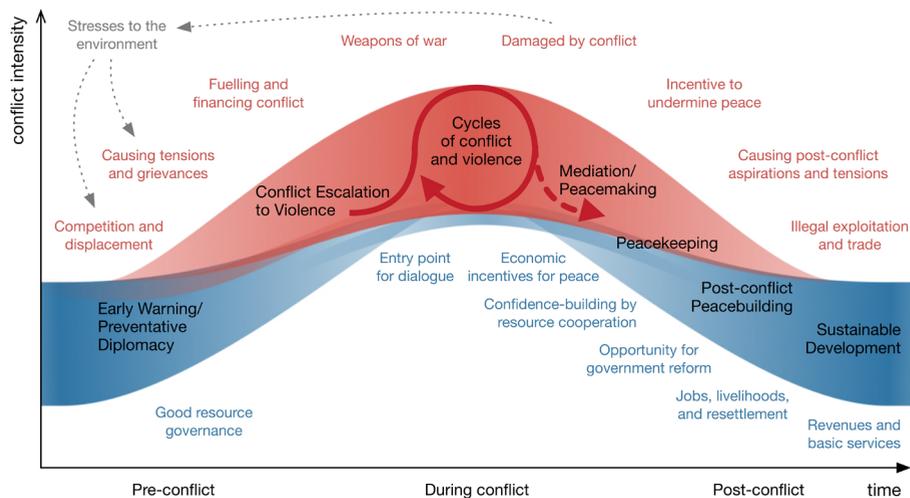
Source: Based on and with permission of UNEP 2016, adapted with information from UNEP 2009; UN DPA and UNEP 2015; Bruch et al. 2019; published in Schellens and Diemer 2020.

Natural resources play many different roles in each phase of the conflict cycle characterised by rising and decreasing intensities of violence. In the pre-, during-, and post-conflict phases, natural resources respectively contribute to grievances and trigger the onset of conflicts; intensifying and perpetuating the violence; and undermining initiatives for the conclusion of conflicts (UNFT 2011; UN DPA and UNEP 2015). The conflict cycle (Figure 2) highlights the risk of getting trapped into intractable cycles of conflict, violence, environmental destruction and underdevelopment. It is an insightful and useful framework to untangle the role of natural resources in different phases of violent conflicts, i.e. in different levels of violence and intensity of the conflict.

2.3.2 The geographical scales of natural resource conflict: local to global dynamics

Although the violence of natural resource conflicts plays out locally, actions and developments of natural resource conflicts occur at different geographical scales simultaneously (Buhaug and Lujala 2005; Schilling, Saulich, and Engwicht 2018). Their local, subnational, national, transboundary, regional, international, and global dynamics are interlinked and difficult to disentangle (Schilling, Saulich, and Engwicht 2018). Qualitative research on natural resource conflicts has mainly been in the form of case studies focused on local, subnational and national levels (e.g. Homer-Dixon 1994; Le Billon 2012), while regional and transnational studies are rather the exception. Quantitative methods have traditionally focused on national scale explanations because statistical data was mainly gathered and available at that spatial resolution (Collier, Hoeffler, and Rohner 2009; Raleigh et al. 2010; Rustad et al. 2011). More recently, quantitative resource conflict studies have also focused more on the local level thanks to the availability of geolocated conflict event data (e.g. Raleigh et al. 2010; Rustad et al. 2011). Raleigh et al. (2010, 653) stated that "if variables are not significant at the level at which the war is fought, conclusions of regional or national studies must be questioned", meaning that all conflicts are local and should be studied as such (Rustad et al. 2011). However, natural resource conflicts have different drivers and actors on different scales (Buhaug and Lujala 2005; Schilling, Saulich, and Engwicht 2018), and it would be inadequate to reduce all theoretical analyses and explanations to one geographical level.

Structuring and clarifying how dynamics at different geographical levels interact with each other will create a more comprehensive understanding of natural resource conflicts (Schilling, Saulich, and Engwicht 2018), and is, therefore, necessary for effective policy interventions to prevent new and curb existing resource conflicts. Figure 3 presents a general overview of actors and

stakeholders in natural resource conflicts from a local to a global scale by Schilling, Saulich, and Engwicht (2018). It provides an example and handle for untangling conflict actors and causal pathways on and across different spatial scales. An in-depth explanation of the scales of conflict pathways and examples at each scale can be found in Schilling, Saulich, and Engwicht (2018).

Figure 3: Actors and stakeholders in natural resource conflicts from a local to global scale
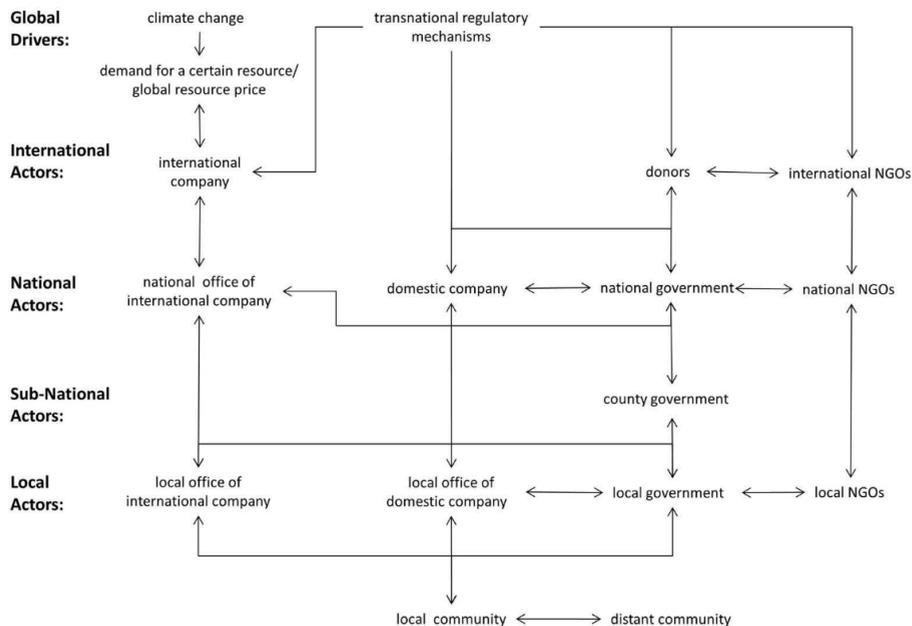
Source: Schilling, Saulich, and Engwicht (2018), with permission to replicate.

2.4   Included papers

The doctoral thesis that this Dissertation Development Brief summarizes has been developed through the work of one peer-reviewed encyclopaedia chapter, three papers, and one manuscript listed below. This Development Brief synthesizes the key results, distils policy implications for conflict prevention and peacebuilding, and reflects on the progress in the field since the publication of the dissertation.

1. Schellens, Marie K., and Arnaud Diemer. 2020. 'Natural Resource Conflicts: Definition and Three Frameworks to Aid Analysis'. Encyclopedia of the UN Sustainable Development Goals. https://doi.org/10.1007/978-3-319-71067-9_81-2

2. Schellens, Marie K., and Johanna Gisladottir. 2018. 'Critical Natural Resources: Challenging the Current Discourse and Proposal for a Holistic Definition'. *Resources* 7 (79): 1–28. doi.org/10.3390/resources7040079.

3. Halkia, Matina, Stefano Ferri, Marie K. Schellens, Michail Papazoglou, and Dimitrios Thomakos. 2020. 'The Global Conflict Risk Index: A Quantitative Tool for Policy Support on Conflict Prevention'. *Progress in Disaster Science* 6: 1–22. doi.org/10.1016/j.pdisas.2020.100069.

4. Schellens, Marie K., and Salim Belyazid. 2020. 'Revisiting the Contested Role of Natural Resources in Violent Conflict Risk through Machine Learning.' Sustainability 12 (16): 6574. https://doi.org/10.3390/su12166574

5. Schellens, Marie K., and Lucas Dawson. n.d. 'Natural Resource Conflicts: Clarifying the Causal Pathways and Identifying Leverage Points'. *Manuscript.*

3 Summary of main findings and discussion

3.1 Defining critical natural resources

Existing descriptions of critical natural resources overemphasize their economic importance at the expense of their ecosystem support and socio-cultural functions. Also, non-renewable resources are overrepresented compared to renewable resources (Schellens and Gisladottir 2018). Therefore, paper 2 of the thesis proposes a new, holistic, definition of criticality for natural resources, based on a hierarchy of human needs.

Based on a systematic literature review, taking into account the identified key components of criticality for natural resources and balancing its different aspects, the resulting definition of a *critical natural resource* is as follows.

Criticality is a relative and dynamic state of a natural resource. A critical natural resource is:

a. of decisive importance, ranked according to a hierarchy of human needs, in relation to the issue or interest group specified, and

b. attended with uncertainty or a threat.

This thesis argues that the importance of natural resources relates to a hierarchy of needs that resources fulfil, as developed by Mancini, Benini, and Sala (2016), i.e. the relative importance of their functions, based on the psychologist Maslow's pyramid of human needs (Figure 4). Further, I argued that this definition encourages a more balanced, holistic understanding of natural resource criticality. It can be applied to renewable as well as non-renewable resources, albeit, preferably to both at the same time, for example in criticality assessments with a wide array of natural resources.

Figure 4. A hierarchy of human needs for natural resources
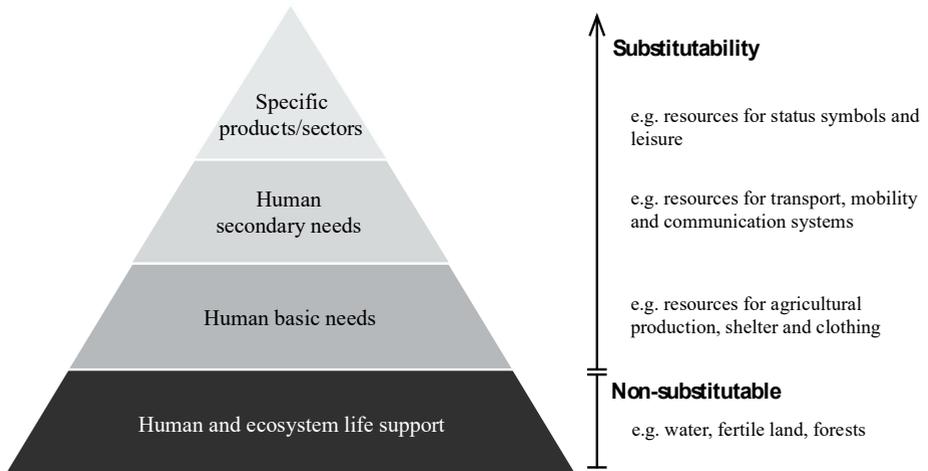
Source: Adapted from Mancini, Benini, and Sala (2016) by adding a substitutability scale on the right. ("Figure 3" in Paper 2.)

3.2 The link between natural resources and violent conflicts can be quantified

The third and fourth papers confirm the importance of natural resource variables in numerically predicting conflict, though their effects are often mediated by the intervening socio-economic variables. More specifically, renewables such as water and food are important predictors of conflict, while non-renewables are less important than prior research suggested. Of all the socio-environmental interactions identified, food production interacts most strongly with its economic and demographic context.

3.3 Core socio-environmental causal pathways linking natural resources and violent conflicts and the opportunities they present to prevent violent conflict related to resource use

The fifth paper identified key structural points on the causal paths towards natural resource conflicts, which potentially function towards effective prevention. To reverse vicious circles of conflict to virtuous circles of peace, my analysis found that it is necessary to improve state and natural resource management institutions, balance resource availability and demand, limit population movements, and ensure adequate livelihoods. My analysis further found that resource exploitation and the revenues generated thereof, as well as environmental conservation and curbing environmental degradation, can stabilize peaceful situations.

3.4 Policy implications for conflict prevention and peacebuilding

The discourse around critical natural resources ascribes certain resources to be more critical than others. Thereby, it has a large influence on the prioritisation of natural resources in decision-making. The proposed definition of natural resource criticality in one of the sub-studies (Schellens and Gisladottir 2018) attempts to balance out the focus on the economic importance of natural resources with other life support and socio-cultural functions. Thereby, natural resource governance based on the proposed definition will better balance out different needs and value orientations for different natural resources. It is mainly criticality assessments of natural resources that have communicative power and can be highly influential for policymaking. Along with building criticality assessments on the proposed definition to balance perspectives, the study argued that assessments should cover a wide range of natural resources, including renewable resources next to the traditional non-renewables (Schellens and Gisladottir 2018).

In line with these recommendations, we (Schellens and Gisladottir 2018) expect
other resources, such as clean water, clean air, forests, fertile soil, etc., to have
a much higher criticality level relative to certain metals and rare earth minerals
that are now commonly considered critical. Consequently, with this proposed
definition, these resources might gain more attention in policy circles. Most
criticality assessments, policy advice and response happen in Western countries
on a national or regional level (e.g. National Research Council 2008; European
Commission 2014; Ciacci et al. 2016). However, our proposed definition is
adaptable to different levels of analysis and interest groups. Thereby, the
criticality of natural resources can be assessed and provide balanced
recommendations for local communities, civil organisations, or companies, to
global civil society, NGOs and multinational corporations.

3.4.1   Conflict prevention and peacebuilding

Paper 5 (Schellens and Dawson, n.d.) provided a first step towards systemic
policy support for the prevention of and peace-building efforts within natural
resource conflicts. The identified key variables of the causal structure of the
conflict-resource nexus can act as indicators for early warning, peacebuilding
constraints, or points of intervention for prevention and peacebuilding. The
intervention points identified from the feedback loops (Figure 3 Paper 5),
clarify specific recommendations or responsibilities for specific actors. For
example, the quality of state institutions is a direct responsibility of national
governments, but can be enhanced by national-scale and international NGOs
or international governmental organisations. Environmental degradation is the
direct responsibility of the polluter, but they might need incentives from
governmental actors to pollute less or clean up afterwards. To be directly
relevant, effective, and actionable recommendations for policy interventions,
the broad analyses of the causal network would benefit from more
complementary analyses for leverage points (Graffy 2008; see section 6).

The causal network can be further aggregated by the same iterative clustering and structural reduction processes to arrive at a readable causal diagram that can function as an educational, informative tool showing the most important aggregated causal pathways, feedback loops, and intervention points for prevention and peacebuilding.

3.4.2　Conflict early warning systems

The validation of the Global Conflict Risk Index (GCRI) in Paper 3 supports the continued use of the predictive model for conflict early warning on the EU level. Publishing open access opened up wider feedback and collaborations from the academic research community for further improvements of a currently applied conflict early warning system. Juncos and Blockmans (2018) have, however, identified a gap between EU early warning and EU response for early action on conflict prevention and peacebuilding. Their research focused on several European national conflict prevention processes. At the EU level, there is not much publicly known about the responses for early preventative action after conflict early warning systems predict a high risk for conflict. This could be interesting and important follow-up research.

Paper 4 (Schellens and Belyazid 2020) demonstrated that precious conflict prevention time and strategies can be gained by considering natural resources in conflict early warning. On the one hand, it is not necessary to include natural resource variables in purely short-term predictive models for early warning – at least up to a risk period of four years into the future, as in this study's models. On the other hand, it is relevant to include natural resources in models that can account for complex interactions if the purpose is to investigate root causes of and complex causal pathways to violent conflicts – either for research or policy-making on conflict prevention. A number of early warning tools for natural resource stresses and conflicts exist, but those limit themselves to one resource,

for example, conflict forecasts based on water security (WPS 2018) or the Global Forest Watch (World Resources Institute 2014). Official international governmental institutes are keen on, but struggling to incorporate natural resource-related conflict risks in in their conflict early warning systems (Halkia 2019; Jensen 2020; both personal communication). Although more complex modelling techniques are better able to link natural resources and violent conflicts for prediction and explanatory purposes, their use in early warning systems will require closer communication and collaboration to foster transparency, understanding, and trust with the end-users compared to simpler prediction models, which would be unable to relevantly take into account natural resource trends (Athey 2017; Usanov and Sweijs 2017).

3.5 Lessons learned from research limitations

In a multi-methods approach, there are many different limitations to be found over the whole range of methods applied. Some of the limitations and challenges of a specific research method applied are balanced by the specific characteristics of another method within the mix of methods applied in this thesis. The publication bias in the systematic literature review is compensated by the quantitative data analyses of the predictive models. The subjectivity and coder bias in open coding are likewise balanced by the quantitative data analyses. Missing data problems of quantitative analyses are in turn counterbalanced by the systematic review of key causal literature on natural resource conflicts. The reduction of conflict observations to country-year units in the quantitative analyses is compensated by the systematic literature reviews and the causal network, which both can consider different spatiotemporal units of analysis at the same time. The problem of reversed causalities in quantitatively analysing conflicts that last longer than four years is partly buffered and revealed by the analysis of key short feedback loops in the causal network. The problem of multicollinearity and estimation of variable

importance in logistic regression models is tackled by the ability of machine learning methods to deal with more complex data patterns. The lack of consideration of and contribution to existing theory during the data selection and analysis of the predictive modelling efforts is balanced by the systemic reviews and causal network that extensively build on the existing body of literature and theory. And lastly, the lack of explanatory power of a simple, transparent conflict early warning model is counterbalanced by the analysis of complex data patterns with machine learning.

The methodological limitations that the multi-methods approach of this thesis did not (sufficiently) manage to address are: the lack of grey literature and non-English language documents in the systematic reviews, the quality of quantitative and qualitative data on natural resource conflicts coming from insecure contexts, the merging of conflict onset, duration, escalation and geographical diffusion in one dependent variable of conflict occurrence, the quality of global soil degradation data, the early stage of causal analysis with machine learning methods, the communication issues between predictive modelling output and policy relevance, the critical assessment of data, methods and interpretations underlying the coding of causal links, the change of the nature of information in causal networks with broadly a loss of agency and geographic relationships, and the completely quantitative identification of intervention points from the causal network. Despite the given limitations, the results can interpreted within the study boundaries, set by those limitations. Subsequently, the limitations and boundaries for interpreting the results provide interesting avenues for further research (see section 6 of the original dissertation 'Outlook towards future research').

# 4 Recent developments since the finalisation of the dissertation

Since the publication of my dissertation (October 2020), the field of environmental security has progressed significantly, both regarding research and practice. Below, I briefly summarize a number of, in my opinion, the most important in trends the field of environmental security, on which to reflect when going over the results of my dissertation.

4.1 A less peaceful world

Sadly, numerous examples show the **decrease in peace and security worldwide**. The Sahel region witnessed numerous national political crises and coups such as Mali (August 2020), Chad (April 2021), Burkina Faso (January and September 2022), Sudan (April 2023), and Niger (July 2023). The last couple of years have seen rising tensions and violence in unsettled border and territorial disputes such as Israel-Palestine and Nagorno-Karabakh (September 2020). Afghanistan saw the complete takeover by the Taliban (August 2021) and concurrent degradation of human, especially women's, rights. Political movements and spokespersons pushing for anti-democratic ideals have gained popularity throughout Europe and North America, while pro-democratic movements are violently suppressed, e.g. Hong Kong's democracy marches (2019–2020) and Iran's women's rights marches (September 2022). Lastly, the invasion of Russia in Ukraine (February 2022) reintroduced interstate warfare, east-west divide, and geopolitical theorizing/strategizing.

Think tanks such as ACLED and CrisisWatch show the systematic nature of this trend towards a less peaceful world through their structured data gathering of armed conflict and political crisis events (see Figure 5).

Figure 5: Number of armed conflict events between 1 January 2010 and 31 December 2022
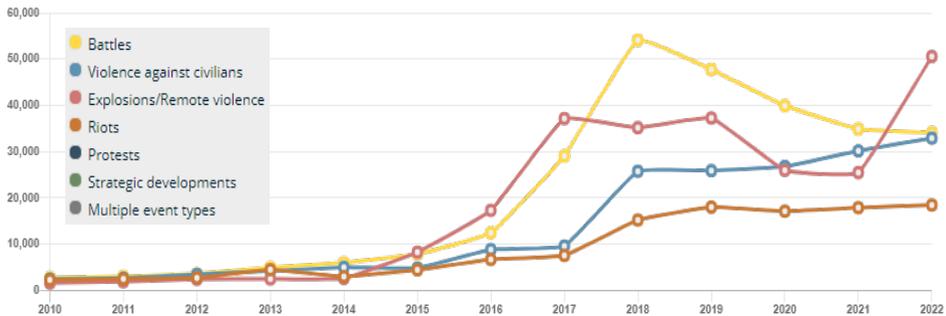
Source: ACLED dashboard 2023.

4.2 Little to no change to curb ever-increasing environmental degradation

Let's start with a little good news: in December 2022, a historical international agreement was adopted to protect and restore 30 percent of Earth's lands, oceans, coastal areas and inland waters (Convention on Biological Diversity, 2022). This was followed in July 2023 by the adoption of the Nature Restoration Law in the EU to place recovery measures on 20% of the EU's land and sea by 2030 (European Parliament, 2023). These are amazing results. Yet, the next steps are not easy: to **transform a global vision and political agreement into practice**. The climate crisis clarifies this hurdle and has only seen limited progress since the international political Paris agreement of 2015 to limit global warming by 1,5 °C by 2050 (Climate Change News, 2020). For a multitude of reasons, the implementation and financing of climate crisis solutions remains a big challenge.

In the meantime, the **triple planetary crisis**, as the UN Environment Programme describes it (UNEP, 2021), forges ahead disturbingly undisturbed, with unprecedented levels of (1) climate change impacts, (2) nature and biodiversity loss, and (3) pollution and waste.

4.3   Research on the natural resources – conflict nexus advances and expands in various strands

The research topic has touched the interest of many scholars and think tanks. Environmental security, geopolitics, climate security, natural resource conflicts, climate security, etc. All these strongly related topics have seen a rise in the number of research outputs over the last years (Ide et al., 2022), pulling in researchers from both the social and environmental sciences into this interdisciplinary field. An **active and growing research community** has resulted in 2 academic conferences – 2020 and 2022 – (Environmental Peacebuilding Association, 2023) and a specialized journal on the topic of 'Environment and Security' with its first publication in February 2023 (Swain et al., 2023). Most of the research still originates from the West and global north. More insights on the topic from other global regions, especially **conflicted-affected regions and communities** directly, would be very valuable and avoid neo-colonialist conclusions and recommendations to practitioners and policymakers.

With the sidenote that I do not follow the current academic publications and debates as extensively as during my time, I would like to share a couple of superficial impressions based on the research that has passed my eyes, referring back to the frameworks and methods applied in my dissertation.

Regarding the three frameworks of analysis presented in this thesis, (1) there is more attention to and explicit descriptions of the specific **scales** at which the conflict is analysed: local, subnational, national, transboundary, interstate, and

international. Yet, only little research aims to (dares to?) address causal pathways that **cross several scales**, such as the disruption of grain production in Ukraine, food security issues and political unrest in the Horn of Africa, or international climate migration.

(2) Regarding the types of **resources** studied, climate change receives the most attention, and with that resources related to a changing climate like freshwater and fertile land. There are issues in comparing studies about the relation between climate change impacts and conflict because of a multitude of approaches to define and measure both **climate change impacts and conflict**. The Inter-Sectoral Impact Model Intercomparison Project (ISIMIP) is a great scientific collaboration aiming towards the **standardisation** of climate change impact studies to make them more comparable. This should lead to useful climate change impact databases useful for climate change security researchers. On the conflict side, there are no efforts known to me to better define conflicts and standardize conflict observations.

(3) Regarding the **conflict cycle**, there is some, but too little, research that is explicit about the phase or the **temporal dynamics** of a conflict under study. This is partly due to a lack of (knowledge about?) research methods to study societal processes in transition.

Regarding the methods applied in this dissertation, a good development is that **machine learning** is applied more widely, both for forecasting and for better causal understanding of indirect causal pathways, e.g. in the Violence & Impacts Early-Warning System (VIEWS 2023) and the Weathering Risk Methodology (Rüttinger et al., 2023). It remains challenging to merge the complementary knowledge produced by **qualitative and quantitative** approaches. Policy-oriented think tanks, instead of academic institutes, are taking the lead on developing such **integrative approaches** (Alston-Voyticky and Kumskova, 2023; Rüttinger et al., 2023). Not a lot of research uses

methods from **system sciences**, which could help build the bridge between qualitative and quantitative insights, to deal with the temporal dynamics of conflicts and the cross-scale impacts of the natural resource–conflict nexus.

More and more environmental and climate data is being produced and shared openly, in more and more accessible ways (good examples are ACLED, CrisisWatch, and EarthMap.org). However, there is a **glaring lack of data literacy** among practitioners and decision-makers in the environmental, peace and security fields. Intricate climate, environmental or conflict modelling approaches are near-to-impossible to understand for non-researchers with only limited time to absorb new knowledge to implement in their daily job. Some practitioners trust the model results completely, even too much – blindly, without any capacity for critically assessing the results. Others, mainly in the peace and security field, are fundamentally distrustful of any quantitative assessments of security, peace and conflict, even more so predictive models. This leads to a **dangerous echo chamber** of well-communicated, although maybe not the most important, results and buzzwords such as "artificial intelligence" (AI), "threat multiplier", "climate conflict", etc. For researchers, this lays a lot of responsibility to clearly and accessibly communicate their results and go the extra mile of presenting their results at fora where practitioners and policy-makers are present.

4.4   Environmental security applied: high awareness, little policy and practice

Awareness about natural resource conflicts has increased significantly among governing and implementing organisations and actors, such as national and international policymakers, as well as peacebuilding practitioners. The knowledge base and understanding of the diverse and contextual pathways between environmental degradation and conflicts has increased a lot.

However much awareness and attention there is to the risks and issues of natural resource conflicts, there is a large implementation gap. This is the next step for this community of environmental security experts. Environmental organisations need to learn to implement peace-positive, conflict-sensitive initiatives; and vice-versa, peacebuilding actors need to learn about environmental no-harm and climate-sensitive approaches. More and more peace organisations are hiring environmental security experts towards that goal (Environmental Peacebuilding Association, 2023). Further, UNEP and PAX have started to build an evidence-base of positive examples of how environmental and peacebuilding action can go hand in hand towards sustainable peace: pilot projects of nature-based solutions for peace and security are gathered and showcased in an online interactive catalogue (PAX, 2023). Rigorous monitoring of environmental and peacebuilding impacts in the long-term is needed to learn, and distil best practices and challenges, actions to avoid, which should then be shared to inspire others e.g. through the online catalogue.

Many policy and implementing organisations are struggling with the interdisciplinary nature of the field: e.g. feeling they are losing focus, trying to tackle too many issues at once, not knowing where to find the right expertise, or not sure where to position the issue within their organisational structure or suite of services. I have heard the same interdisciplinary struggles being discussed within UN organisations, national governments, and NGOs.

Because an increasing amount of organisations getting involved in the research and the implementation of environmental security projects, there are many opportunities to join forces and leverage each other's strengths and expertise. It takes time and effort to create a joint vocabulary, productive collaborations, and strong alliances. Luckily, there have been organisations that have taken up a leading and driving role in building a strong, collaborative community: the Environmental Peacebuilding Association from the United States and the

Geneva Peace Platform from the European continent. It would be great to see such alliances initiated on other continents as well to ensure a non-neo-colonising collaborative working environment.

Lastly, the international legal framework has not yet incorporated environmental degradation from violent conflicts in any way. There are so far no international agreements on the protection of the environment during war, no guidelines on assessing environmental damage from war, and no mechanisms for declaring war damage to the environment and demanding compensation and restoration. The Ukrainian government is active on this front though, pushing the frontiers forward for compensating the damages done by the Russian invasion to the environment, based on, among others, the human right to a clean, healthy, and sustainable environment (UN, 2021).

5   Conclusions and recommendations

Although natural resource conflicts do receive sufficient attention from practitioners and policymakers, it is not always very clear how the latter should act to prevent or resolve violent natural resource conflicts. This thesis attempted to clarify some systemic interlinkages in the complex causal structure of natural resource conflicts and thereby produced a number of insights practically relevant to the prevention of violent intrastate natural resource conflicts. These include:

(1) holistic frameworks to aid the analysis and understanding of a certain environmental security context: i.e. the conflict life cycle and the scales and actors of drivers of natural resource conflicts;

(2) an in-depth diagnosis of the criticality of natural resources, where socio-cultural and life-support functions of natural resources should receive more weight in comparison with currently dominant economic aspects;

(3) the use of numerical tools for early warning and understanding,

(4) the identification of socio-economic and political leverage points along the causal pathways between critical natural resources and violent conflicts.

The above recommendations are only more relevant because of the decreasing trends of peacefulness and environmental health in our world. Based on the progress and trends in the environmental security field during the past years (section 4), I would like to add the following recommendations:

For research:

1. support research on environmental security within conflicted-affected regions by their communities directly to avoid neo-colonialist interpretations and recommendations to practitioners and policymakers;

2. request supported research to specify the conflict phase and geographical scales they are researching, and encourage them to research causal pathways that cross several scales and conflict phases;

3. support the standardisation of climate change impact studies as well as conflict definitions and observations to ensure studies become more comparable;

4. support research that applies integrative approaches, merging complementary knowledge from qualitative and quantitative approaches.

For policy and practice:

1. improve the data literacy among practitioners and decision-makers in the environmental and peace and security fields to avoid a dangerous echo chamber of well-communicated, although maybe not the most important, results and buzzwords;

2. fill the implementation gap by supporting rigorously designed, monitored and evaluated pilot projects on environmental peacebuilding, and share

their good practices and challenges, preferably implemented by conflict-affected communities directly.

3. support the alliance-builders of this field to ensure productive interdisciplinary collaborations;

4. support the development of internationally binding legal agreements on the protection and restoration of the environment from war damages.

References

Most references can be found in the original thesis bibliography (mainly from sections 1 to 3):

Schellens, M. K. (2020). 'Violent natural resource conflicts: From definitions to prevention'. Dissertations in Physical Geography, ISSN 2003-2358; 9. PhD dissertation, Department of Physical Geography, Stockholm University, and Department of Political Sciences, University of Iceland. Available at: http://www.diva-portal.org/smash/record.jsf?pid=diva2%3A1462874&dswid=6325

Additional references are listed below (mainly from section 4: 'Main developments since the finalisation of the thesis):

ACLED. 2023. Dashboard. Armed Conflict Location & Event Data Project. Accessed during August 2023 at: https://acleddata.com/dashboard/#/dashboard

Alston-Voyticky, Isaac Jeffrey Raphael, and Marina Kumskova. 2023. 'Localising Climate, Peace and Security: A Practical Step-by-Step Guidance Note for Local Peacebuilders'. Global Partnership for the Prevention of Armed Conflict. Accessible at: https://gppac.net/resources/localising-climate-peace-and-security-practical-step-step-guidance-note-local

Climate Change News. 2020. 'After five years, here are five things the Paris Agreement achieved – and didn't'. Published on 9 December 2020 at: https://www.climatechangenews.com/2020/12/09/five-years-five-things-paris-agreement-achieved-didnt/

Convention on Biological Diversity. 2022. 'COP15: Nations adopt four goals, 23 targets for 2030 in landmark un biodiversity agreement'. Official CBD Press Release. Published on 19 December 2022 at: https://www.cbd.int/article/cop15-cbd-press-release-final-19dec2022

Environmental Peacebuilding Association. 2023. 'Conferences'. Accessed during August 2023 at: https://www.environmentalpeacebuilding.org/conferences/

Environmental Peacebuilding Association. 2023. 'Jobs'. Accessed during August 2023 at: https://www.environmentalpeacebuilding.org/news/jobs/

European Commission. 2021. 'Conflict Minerals Regulation: The regulation explained'. Accessed during August 2023 at: https://policy.trade.ec.europa.eu/development-and-sustainability/conflict-minerals-regulation/regulation-explained_en

European Parliament. 2023. 'Nature restoration law: MEPs adopt position for negotiations with Council'. Press Releases. Published on 12 July 2023 at: https://www.europarl.europa.eu/news/en/press-room/20230707IPR02433/nature-restoration-law-meps-adopt-position-for-negotiations-with-council

Halkia, Matina, Stefano Ferri, Marie K. Schellens, Michail Papazoglou, and Dimitrios Thomakos. 2020. 'The Global Conflict Risk Index: A Quantitative Tool for Policy Support on Conflict Prevention'. Progress in Disaster Science 6: 1–22. doi.org/10.1016/j.pdisas.2020.100069.

Ide, Tobias, McKenzie F. Johnson, Jon Barnett, Florian Krampe, Philippe Le Billon, Lucile Maertens, Nina von Uexkull and Irene Vélez-Torres. 2023. 'The Future of Environmental Peace and Conflict Research'. Environmental Politics, DOI: 10.1080/09644016.2022.2156174.

PAX. 2023. 'Catalog of Nature-based Solutions for Peace and Security'. Available at: https://www.ecosystemforpeace.org/nature/

Schellens, Marie K., and Salim Belyazid. 2020. 'Revisiting the Contested Role of Natural Resources in Violent Conflict Risk through Machine Learning.' Sustainability 12 (16): 6574. https://doi.org/10.3390/su12166574

Schellens, Marie K., and Lucas Dawson. n.d. 'Natural Resource Conflicts: Clarifying the Causal Pathways and Identifying Leverage Points'. Manuscript.

Schellens, Marie K., and Arnaud Diemer. 2020. 'Natural Resource Conflicts: Definition and Three Frameworks to Aid Analysis'. Encyclopedia of the UN Sustainable Development Goals. https://doi.org/10.1007/978-3-319-71067-9_81-2

Schellens, Marie K., and Johanna Gisladottir. 2018. 'Critical Natural Resources: Challenging the Current Discourse and Proposal for a Holistic Definition'. Resources 7 (79): 1–28. doi.org/10.3390/resources7040079.

Swain, Ashok, Carl Bruch, Tobias Ide, Päivi Lujala, Richard Matthew, and Erika Weinthal (2023). 'Environment and security in the 21st century'. Environment and Security, 0(0). https://doi.org/10.1177/27538796221149609

UN. 2021. 'Access to a healthy environment, declared a human right by UN rights council'. UN News. Accessed at: https://news.un.org/en/story/2021/10/1102582

UNEP. 2021. 'Making Peace With Nature'. UN Environment Programme synthesis report. Accessible at: https://www.unep.org/resources/making-peace-nature

VIEWS. 2023. The Violence & Impacts Early-Warning System. Uppsala University and Peace Research Institute Oslo. Accessed during August 2023 at: https://viewsforecasting.org/

Rüttinger, Lukas, Janani Vivekananda, Christian König, Barbora Sedova. 2021. 'Weathering Risk Methodology'. adelphi and Potsdam Institute for Climate Impact Research (PIK). Accessible at: https://weatheringrisk.org/en/methodology

What are the mechanisms at play when conflicts related to natural resources become violent? That is one of the questions that this Development Dissertation Brief (DDB) tries to answer. To reverse vicious circles of conflict to virtuous circles of peace, it is necessary to improve state- and institutional management of natural resource.

Vilka mekanismer har betydelse när konflikter om naturresurser blir våldsamma? Det är en av frågorna som denna Development Dissertation Brief (DDB) försöker besvara. Att stärka staters och institutioners förvaltning av naturresurser kan bryta negativa cirklar av konflikt, och bidra till fredliga lösningar.

This is a Development Dissertation Brief (DDB), where EBA gives recent PhDs the opportunity to summarise their dissertation, focusing on its relevance for Swedish development cooperation. If you are interested in writing a DDB, please contact us: ud.eba@gov.se

The Expert Group for Aid Studies – EBA – is an independent government committee analyzing and evaluating Swedish International Development Aid.
www.eba.se