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The Many Faces of Environmental Security

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Abstract

This review surveys recent evidence on environmental security, bringing diverse approaches to the subject and evidence relating to different environmental issues into conversation with one another. We focus on the five environmental issues most commonly viewed as having conflict or security effects: climate change, water, forests and deforestation, biodiversity and conservation, and mining and industrial pollution. For each issue, we consider evidence along three dimensions: the impacts of environmental variables on violent conflict, the conflict impacts of policy and development interventions vis-à-vis these environmental issues, and their global policy framing and institutionalization. Through this, we draw particular attention to the poverty and/or inconsistency of the evidence relating to environmental variations, which stands in stark contrast to the extensive evidence on policy and development interventions; noting that policymakers have been much more concerned with the former theme than the latter, we call for this imbalance to be addressed.

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1. INTRODUCTION

Environmental security is, and has always been, something of a mystery. The origins of the term can no doubt be easily traced: the late 1980s and early 1990s; the United States, Canada, and Western Europe; and research and campaigning by assorted liberal, progressive, and environmentalist scholars and think tankers, and the foundations and funding agencies supporting them. But beyond this, the oddities pile up. For its early advocates, environmental security was never about securing the environment against the ravages of human exploitation. Its proponents never used it to systematically explore the impacts of war and militarism on the environment. They barely touched on certain types of environmental problems, including most notably industrial pollution and biodiversity loss. And they said next to nothing about the security consequences of policy and development actions vis-à-vis environmental issues. Instead, the overwhelming focus of this first-wave work, associated, for instance, with Tuchman Matthews (1), Gleick (2), Myers (3), and most famously Homer-Dixon (4, 5), was on how particular types of abstracted environmental issues and the social dynamics thought to be associated with them—and not all such issues or dynamics, by any means—were affecting, or might come to affect or determine, patterns of large-scale or acute violent conflict.

Moreover, in the intervening years, debates on environmental security have become more mysterious still. Both research and policy work on the subject have expanded hugely and become more institutionalized, including recently through the establishment of a new scholarly journal, *Environment and Security*. However, the same priorities and silences that characterized late-1980s and 1990s environmental security thinking continue to hold sway across mainstream academic and policy discourse on environment–security linkages. And in tandem with this, environmental security as a general thematic and comparative object of analysis has for all intents and purposes disappeared. Climate security—the question of the conflict and security implications of climate change—has replaced environmental security as the focus of most mainstream academic and policy analysis. Reviews are published most years on the former, but hardly any on the latter (the exception being the regular reviews of research on environmental peacebuilding) (6). Many non-climate issues (e.g., water- and deforestation-related conflicts) are now approached primarily through the lens of climate change, instead of being analyzed in their own right and with appropriate regard to their many non-climatic causes. And there is now little dialogue across, let alone comparison between, environmental issue areas (for example, comparison of the conflict and security consequences of climate change with those associated with deforestation or declining fish stocks). In addition, the last 20 years have seen a proliferation of new methodological, theoretical, and normative approaches to the study of environment–security relations, often combined with a failure to even acknowledge, let alone engage in dialogue across, these analytical divides. For instance, review essays and journal special issues on climate security routinely exclude everything but quantitative

studies (plus sometimes certain types of qualitative evidence) from their review data sets, wholly failing to engage with evidence from more critically informed perspectives and methodologies (7).

The objectives of this article, in this context, are to bring evidence relating to different environmental issues, and as analyzed using diverse theories and methods, into conversation with one another, and on this basis to identify commonalities, divergences, uncertainties, and knowledge gaps that apply to the environment–security *problematique* as a whole. Stated differently, our aim is to compare across the various substantive as well as analytical siloes that have come to characterize most research and policy discourse on the environment and security in recent years—what may be considered the many faces of environmental security. We focus specifically on those five environmental issues on which there is, in our judgement, the most extensive, if not necessarily the most consistent or robust, evidence: (*a*) climate change, (*b*) water, (*c*) biodiversity and conservation, (*d*) forests and deforestation, and (*e*) mining and industrial pollution. In the process, we consider findings relating to the full spectrum of spatial scales and geographical contexts; deriving from large-*N*, comparative, and case study research designs; using everything from quantitative to interview, ethnographic, and discourse analytical techniques; and informed by a range of theoretical approaches, including Malthusianism, political ecology, postcolonialism, and securitization theory.

We proceed as follows. Section 2 expands on the themes introduced above, by mapping out the major conceptual, theoretical, and methodological differences that bedevil environment–security research. This sets the stage for our substantive and comparative analysis of the evidence relating to climate change, water, biodiversity and conservation, forests and deforestation, and mining and industrial pollution. Section 3 pursues this by considering, for each of these five environmental issues, the evidence on the impacts of environmental variables themselves, and changes therein, on patterns of violent conflict. Section 4 turns to the impacts of policy and development interventions vis-à-vis these environmental issues on patterns of violent conflict. Section 5 examines the dominant global public and policy narratives on, and institutionalization of, environmental security, considering which environmental issues are focused on, how these are represented, and their fit with the evidence in previous sections. Section 6 concludes with summary comparative comments on the foregoing evidence, as well as recommendations for research and policy.

2. CONCEPTUAL, METHODOLOGICAL, AND THEORETICAL ISSUES

Research on the security implications of environmental problems and changes is characterized by four major cross-cutting sets of difference: on the meaning of security; the meaning of environment; and the appropriate theoretical premises, and the research designs and methods, for studying their relations. On all four fronts, dilemmas and disagreements currently loom large. Here we briefly survey these four sets of issues, before clarifying how we approach them within this review. Our comments here are necessarily brief, being intended merely to provide an overview of the range of existing approaches, and as a gateway to justifying our own.

The meaning of security within environmental security, firstly, has become subject to a huge diversity of interpretations, paralleling broader developments within post–Cold War security studies. Within the first wave of environment–security research, security was essentially equated with national and international security, and the substantive focus of this work was acute, and actually or potentially violent, large-scale civil conflict (4, 5); most contemporary mainstream environmental security research assumes similarly. Others, however, have sought to contest, or at least go beyond, such understandings. Thus, some, especially in public and policy framings, have focused on the implications of environmental change for interstate conflict and instability (8). Some have focused on local, diffuse, chronic, and/or slow forms of violence, viewing these as the more

common or likely correlates of environmental problems and changes (9). Others have focused on specific elite-led forms of violence, especially state repression and violence against environmental defenders, which are not well represented within mainstream environmental security research (10). Some have focused not just on acts of violence themselves but also on those material and rhetorical infrastructures that facilitate and help prepare for them—that is, on apparatuses of militarization (11). Building on the idea of human security, others have sought to shift away from a sole focus on violence to consider how environmental problems and changes are affecting human vulnerabilities and well-being more broadly (12). Some, slightly more narrowly, have framed the environmental security *problematique* as armed conflict plus large-scale environment-related humanitarian disasters (13). Others, taking the question of the referent object of security in a rather more radical direction, have defined security in ecological terms to encompass the rights and needs of ecosystems and nonhuman species (14). And still others have argued that security has no objective referent and is instead constructed through discourse, thus questioning the attempt to define it in objective terms (15).

The environmental component of environmental security is marked by different but no less significant conceptual disagreements. Within first-wave environmental security research, the main and often exclusive focus was on how the degradation or depletion of environmental resources may contribute to conflict (4), with this scarcity framing having since remained dominant across both research and policy. Against this mainstream, however, others have insisted that the conflict implications of environmental abundances should be considered as well as those associated with scarcity; that abstracting environmental change into an independent variable risks masking the political and economic causes both of environmental change and of any resulting conflicts; that policy and development environmental interventions (mega-dam construction or the establishment of conservation spaces, for instance) may also contribute to conflict; and that a failure to consider such dynamics can often segue into environmental determinism, even when variables besides environmental ones are considered (16–18). Beyond this, there are questions about the boundaries between environmental and non-environmental resource security issues (for instance, about whether minerals and fossil fuels, or indeed land, should be considered within environmental security research); about whether this research should focus just on changes over time, or also consider variations in physical geography (e.g., the associations between mountains, or different climatic zones, and conflict); about whether it should focus just on existing and historical environmental changes, or also on projected or anticipated ones; about the regular conflation of discussion of the environment as a contributory or causal factor, and the environment as a tactical context for or instrument within violence (e.g., the use of dams, fog, forests, or disasters within military or counterinsurgency tactics); and more broadly about the meaning of environment within environmental security research, as a discursive invention that is even more recent than security (19). And last, there are questions about which environmental issues should be analyzed, mainstream environmental security research having focused overwhelmingly on a narrow band of issues—especially climate change, as discussed, but also, within first-wave research, water (20).

Many of these differences can be mapped onto implicit or explicit theoretical commitments. Thus, first-wave environmental security research was overwhelmingly Malthusian (or neo-Malthusian) in its premises, taking resource scarcities as its point of departure, deeming these to be generally worsening, and in turn finding environmental change to be a significant and deepening source of conflict (2, 3, 5). Liberal (or neoliberal) readings have repeatedly questioned such conclusions, above all by disputing the strength of the evidence on environment-related conflicts and, theoretically, by insisting that resource scarcities may be overcome or at least mitigated via technological and economic developments and efficiencies (21). Political ecologists, in another

contrast, have sought to analyze environmental change and its consequences within the context of capitalist accumulation development and state-building processes, interpreted as inherently extractive, exploitative, and violent (16, 18). Discourse analysts have, from various theoretical starting points, warned against attempts to securitize the environment on the grounds that acts of securitization may be dangerous and potentially self-fulfilling (15, 22). Anthropologists have shown that the environment is a theater of war, and not just a resource or victim (23). Postcolonial scholars have questioned the prevailing focus of mainstream environmental security research on the Global South, and on specific local and internal types of conflict, viewing both as misleading and reflective of Eurocentrism and continuing Northern epistemic dominance and hierarchies (24). And feminist scholarship has drawn attention to the gendered nature and causes of environmental insecurities and violence, and the dominant framings of them (25).

Last, the environmental security field is also characterized by a diversity of research designs and methods. Common to these is recognition of the unavoidable complexities involved in studying environment–security relations—not only the many different environmental variables, and different types and scales of conflict and insecurity, but also (*a*) the multiplicity of indirect causal pathways and intervening variables through which environmental changes may affect patterns of conflict and insecurity; (*b*) the importance of contextual ecological, economic, social, and political factors; (*c*) the potentially long time lags between environmental changes and security effects (years or even decades); (*d*) problems of scale and location, given that both environmental changes and conflicts are often locally specific, and that environmental changes may have trans-local effects (e.g., via trade in resource commodities or via migration); (*e*) problems of data quality and availability; and (*f*) problems of case-selection bias (arising especially from a focus on conflictual/violent as against peaceful contexts) (26). Yet, despite little disagreement on these complexities, the methodological strategies for navigating them have varied greatly. Qualitative process tracing work has sought to trace linkages and pathways between environmental and conflict variables—but has been critiqued for its inability to specify their causal significance, and for its underestimation of political and economic contexts (27). Other qualitative research has paid much more attention to contexts, but has often as a result failed to reach cross-case or generalizable conclusions. Typically, such research has used single–case study or small-*N* comparative methods—though research in the former category has faced particularly acute problems with generalization, and even paired-case research designs using similar environmental conditions but different conflict outcomes do not provide a firm basis for comparison (13). An ever-growing body of quantitative research has sought to mitigate these problems by testing for correlations between specific environmental, conflict, and intermediary variables, for example, precipitation, agricultural production, and battle deaths—but this research, which is most extensive in relation to climate, is beset by both methodological problems and contradictory findings (28, 29). And other research has explicitly adopted mixed-methods strategies, combining quantitative with broad qualitative comparative analysis (30). There is clearly no methodological silver bullet for understanding environment–security linkages.

These conceptual, theoretical, and methodological differences are not a major focus here: We start with them simply to highlight the diversity of environment–security research and to help position and justify our approach within this review. The latter may be summarized as follows. First, we restrict our analysis to evidence relating to acts of and preparation for violent political conflict, understood as involving bodily harm or at least coercion. We thus exclude consideration of broader evidence relating to human and ecological security and humanitarian disasters, except insofar as these themselves contribute to violent conflict. We consider evidence relating to the full spectrum of forms and scales of such conflict, including state and elite violence against domestic populations and low-level and diffuse forms of violence and repression—both of which are

often neglected within conflict data sets and the mainstream analyses they inform. Though we sometimes use just the term conflict in what follows, we use this as an imperfect shorthand, acknowledging that conflict can take nonviolent (e.g., protests, judicial harassment) as well as violent forms, and restricting our analysis to the latter.

Second, we focus solely on the causal impacts of environmental variables, plus policy and development interventions relating to them, on this violent conflict, thus excluding consideration of the instrumental and tactical use of environments during fighting; of nonviolent, cooperative, and peaceful outcomes; and of the reverse causality, the effects of conflict, war, militarism, and, conversely, peacemaking on environmental degradation and insecurities (though we return to this issue in the conclusion). We consider evidence relating to a broad suite of environmental issues—as mentioned, climate change, water, biodiversity and conservation, forests and deforestation, and mining and industrial pollution—across them considering multiple causal pathways and processes. These include, crucially, both scarcity and abundance dynamics, both existing and anticipated environmental changes, and conflicts associated with both variations in time and space and environmental policy and development interventions. We survey findings from the full spectrum of theoretical and methodological approaches discussed above. We focus on contemporary and recent environment–security linkages, excluding evidence from before 1990 (except to discuss historical legacies to, and comparisons with, the present day) and also excluding discussion of the future (except to discuss how constructions of the future are affecting existing security practices and processes). We draw mostly upon academic literature but also sporadically refer to nonacademic sources where they provide crucial and robust evidence. Our overall approach is inductive, drawing upon a wide array of types of examples and evidence (including types that typically are not included in discussions of environmental security), and seeking to generalize from this with a minimum of a priori theorization. We recognize that this approach—and especially our restrictive focus on violent conflicts only, and on the consequences of environmental changes and interventions—involves the exclusion of certain types of thinking and evidence, but we opt to frame the review in this (quite orthodox) way to establish a basis for comparison and generalization, both between the five environmental issues noted above and between key theoretical approaches.

3. ENVIRONMENTAL VARIATIONS AND VIOLENT CONFLICT

We start by considering how environmental changes, and different environmental geographies, may have contributed to violent political conflict, in the process exploring the relative importance of scarcity and abundance dynamics within them.

Water was the leading focus of first-wave environmental security research, owing both to its undoubted importance and to fears that deepening water resource scarcities were generating (or were likely to generate) increased competition and in turn violent conflicts. This first-wave research was distinctly Malthusian in framework, in that it viewed water conflicts as essentially driven by scarcity-induced competition; moreover, it focused principally on the international level, examining the record of and potential for interstate "water wars" (20). However, even the main proponent of this early work recognized that there was "little empirical support" for the hypothesis that "environmental scarcity causes simple scarcity conflicts between states" (5, p. 18), and subsequent research has concluded that there is negligible evidence of transboundary water conflicts, and that water is much less associated with interstate conflict than with cooperation (31). As various liberal-oriented scholars and institutions have argued, technological and economic developments—especially the import of "virtual water," i.e., the offshoring of water demands by water-poor states through increased food and commodity imports—mean that local and regional

water scarcities do not necessarily translate into increased conflict pressures (32). The dominant pattern within international watercourses is instead hydro-hegemony, that is, the persistence of striking asymmetries in power over, and access to, water resources, without these translating into militarization or military conflicts (33) or, stated differently, the coexistence of cooperation and nonviolent conflict (34). Although certain particularly high-profile transboundary rivers, most notably the Nile and Euphrates, are regular focuses of acute political rhetoric and international policy concern, even in these cases there is negligible robust evidence of deepening water scarcities contributing, or needing to contribute, to military conflict (35).

The same applies on the internal, social level, there being only limited evidence of internal water scarcities, or poor water quality, contributing to violent conflict. Even in contexts like southern Iraq, where violent protests over water issues have occurred (36), as discussed below, the contribution of biophysical scarcity to this violence is unclear—it being unclear, for instance, whether the protests in question would have occurred in the absence of their more direct sociopolitical triggers. As for the evidence on how geographical variations in water availability affect conflict, although some studies have found that water-stretched countries see more militarized conflict over water, such findings typically rely on evidence of navigation disputes, within which water scarcity is not a factor, and so are not credible (37). Indeed, recent research has found violent conflict to be more closely correlated with biophysical water abundance than with water scarcity. For instance, there has long been military and civil violence over Israeli control of and access to the relatively abundant water resources of the West Bank, but nothing equivalent over the relatively scarce waters of Gaza (18).

Like water, forests were also approached within first-wave environmental security research, mainly through a scarcity optic, on the basis that the degradation and removal of forests were already contributing to violent conflict, and may come to do so increasingly in the future. Yet little evidence to this effect has emerged, besides one study finding that deforestation is correlated with low-intensity conflicts (38)—a finding that, by itself, does not distinguish between whether this deforestation is a contributor to or caused by conflict. Beyond this, research has mostly emphasized the links between forest abundance and violent conflict, through the contributions made by timber sales to rebel and military financing in contexts like Sierra Leone (39), Myanmar (40), and Colombia (41). Yet such particular cases aside, whether there is a general relationship is questionable. Whereas some research has found, for instance, that higher forest revenues are associated with a higher number of killings of environmental defenders (42), other research has concluded that the presence of abundant forest resources increases neither conflict incidence nor its duration (43).

By contrast with the above, first-wave environmental security researchers largely dismissed the possibility that biodiversity decline might contribute, or might already be contributing, to acute conflict, except in the most indirect of ways (4). Over the last decade and a half, however, a range of conservation actors, and some academic studies, have alleged direct links between wildlife poaching and terrorist and insurgent financing (44). Yet elsewhere, such "White Gold of Jihad," "poacher as terrorist," and "ivory terrorism" narratives have been shown to be empirically flawed and misleading (45–47). Beyond this, although conservation science work periodically notes that armed conflict and biodiversity hotspots often overlap (48), there is no reason to imagine—and no research has identified—a causal relationship between the two.

First-wave environmental security scholarship also said little about the conflict and security effects of mining and pollution and, indeed, with biodiversity, was skeptical about the significance of any such effects (4). (Although there is of course an extensive literature on "conflict minerals," this literature focuses on economic opportunities and incentives rather than environmental consequences and, hence, as in most environmental security scholarship, is not considered

here.) This silence has continued within most mainstream discussions, arguably reflecting the overwhelming preoccupation of mainstream research on environmental security with how abstracted environmental variations, especially scarcities, can contribute to conflict—a framing that is ill suited to understanding mining or pollution dynamics. Against this silence, the environmental consequences of mining are a regular factor in violence—but these cannot be understood as functions of environmental variations as such (as discussed in the next section). The closest one finds to evidence on environmental variations per se as contributors to violent conflict is research that finds a positive relationship between pollution exposure and the frequency and magnitude of social (rather than violent) conflicts, for instance in China (49).

Paralleling the early research on water and forests surveyed above, early work on climate change and security was also essentially Malthusian, being focused on how climate change might exacerbate scarcities and generally being deeply alarmist about looming climate wars and climate conflicts. Today, building upon this, the standard mainstream position is that climate is "a risk factor for conflict" (50). Yet both types of formulation are questionable: Whereas early Malthusian work on climate and conflict was more speculative than evidenced (51), and has now been superseded by a large body of research that questions the drawing of simple linkages, the claim that climate per se (and not just anthropogenic climate change) is a risk factor for conflict is without clear meaning, just as claiming the same of geography or the economy would be. At the very least, the question of how climate change may affect security requires disaggregating to consider the diverse environmental pathways through which it may do so.

The most obvious of these pathways is through impacts on temperature, with a significant body of research finding warmer temperatures to be correlated with increased social and political violence (and this finding typically being explained with reference to human physiology, or impacts on crop yields). One well-known study of sub-Saharan Africa, for instance, identifies an association between warmer years and increased civil war incidence during the same year, and on this basis projects a warming-induced increase in African battle deaths of approximately 54% by 2030 compared to the baseline 1981–2002 period (52). Other research has identified links to everything from interpersonal violence to criminal violence and civil war (7). Yet there are multiple problems with such findings (28). They are, first of all, less about global climate change impacts per se than about patterns associated with short-term weather fluctuations, and it is not self-evident that the latter provide a robust basis for drawing conclusions about the former. Such findings are also contradicted by others from previous historical eras, which find increased violence and instability to be associated not with warming but with periods of relative cold (53). There are always, in such studies, questions about coding assumptions, and hence about both internal and external validity. And questions also arise regarding this research's links to nineteenth- and early-twentieth-century climate determinism, when it was argued, based on racist assumptions, that more temperate climates made for more civilized, and less violent, societies (54). Though it is possible that global temperature rises are contributing to political violence, the evidence to this effect is far from clear.

On precipitation variations, especially droughts, something very similar applies. A large number of quantitative studies identify droughts as contributors to conflict through their impacts on agricultural production and livelihoods as well as migration. Some case study analyses have argued similarly, most notably in relation to the Syrian civil war (55) and the 2003–2005 war in Darfur (56). Yet from neither source type is the evidence convincing. Whereas some quantitative studies have found low rainfall to be associated with conflict, others have found this of high rainfall, still others have found high rainfall to be associated with reduced conflict, and still others have found no meaningful correlations either way (28). Moreover, the claimed impacts of climate change–induced droughts on civil war onset in Syria, Darfur, Mali, and elsewhere have been shown to be

somewhere between overstated and negligible, with other political and economic factors being the key determinants of environment-related conflicts and insecurities (18, 57–60).

The balance of evidence on disasters and conflict—which is sometimes framed in relation to climate change, sometimes not—is similar. Early work on this theme concluded that in the immediate aftermath of flooding or hurricanes there is increased coordination and cooperation between conflict parties, but little long-term effect (61). More recently, however, research has been divided, with some studies finding that disasters lead to scarcities that increase conflict incidence, some finding reduced violence post-disaster, and some finding no clear causal relationship either way (62). Still other research finds that disasters, although not important drivers of conflict, do nonetheless change the strategic environment in various ways, for instance, by increasing opportunities for rebel recruitment (30).

We draw three initial conclusions from all of this. First, across the five environmental issues surveyed, the evidence on the contribution of environmental variables to violent political conflict is thin, weak, uncertain, and/or contradictory. Notwithstanding headline claims about climate being "a risk factor for conflict," for instance, the consensus view of even the mainstream scholars who reached this verdict is that climate is a relatively low risk factor for conflict (evaluated as fourteenth out of 16 factors considered), is particularly uncertain (evaluated as the most uncertain of 16 factors), and is a factor over which there is "low confidence" in the mechanisms through which climate affects conflict (50). Second, scarcity accounts of environmental conflict, which focus on the security impacts of natural resource availability shortages, are particularly unconvincing, there being much stronger evidence on the conflict effects of relative resource abundance, as argued in "resource curse" or "honey pot" (63) interpretations of environmental conflict, and discussed further in the next section. And third, although the body of evidence on climatic variables and conflict is much more extensive than on the other environmental issues considered here, dominating climate–security research, it is no less uneven. Indeed, our assessment is that the evidence is most robust on water and forests, through resource curse dynamics; that it is most extensive but also mixed on climatic variables; and that it is thinnest in relation to biodiversity and pollution.

4. POLICY AND DEVELOPMENT INTERVENTIONS AND VIOLENT CONFLICT

Having surveyed the evidence on environmental variables and violent conflict, we now turn to policy and development interventions relating to the environment. We include under this heading three overlapping types of intervention that may involve or contribute to violent conflict: (*a*) purposeful actions to transform, access, or capture environmental resources; (*b*) purposeful actions to limit, mitigate, or otherwise respond to environmental problems and changes, including through what has been labeled green grabbing (64); and (*c*) actions to oppose these types of intervention, or to suppress any such opposition.

On water first, extensive evidence indicates that all three types of intervention involve or contribute to violence. There is now a large literature on "water grabbing," which details state and corporate practices of appropriating, and limiting others' access to, specific watercourses, aquifers, water-rich agricultural lands, and water supply networks, as well as the use of violence to these ends (65). Mega-dam construction and the flooding of lands behind them have long involved large-scale local livelihood destruction and displacement, accompanied by forced implementation, resistance and local repression, and the periodic spillover of such local (or trans-local) conflicts to the national level (66). Such processes continue today (67). Dam building also periodically contributes to significant interstate national security rhetoric and military tensions, if only rarely actual engagements; the conflict implications of even such controversial dams as the Grand Ethiopian Renaissance

Dam are widely overstated (68). The drainage of wetlands and destruction of wetland-dependent livelihoods have long been associated with the same. Processes of water privatization, and the accompanying commodification of and/or increases in the price of water supplies, have also periodically been met with civil resistance and violent state responses (69). Endemic water sector clientelism, corruption and mismanagement, and attendant health and livelihood consequences have triggered violent protests in contexts like southern Iraq (36). More broadly in contexts like Iraq, individual and nongovernmental organization (NGO) activism around water issues has been met with arbitrary arrests and violence, including kidnappings and torture (70). And there is also extensive evidence of gender-based violence in relation to water, especially of sexual and physical violence against women walking long distances to access it (71). Although such interventions and forms of violence are often presented as functions of or responses to scarcity, such representations both obscure the agency of those engaged in them and are contradicted by their standard deployment in relation to relatively abundant water resources. Indeed, instead of being understood as resulting from environmental variations, they are better understood within the context of established social and political structures, and/or long-term and ongoing processes of economic and political development, including processes of agricultural intensification, frontier colonization and state-building, and legacies that reach back to the colonial and early postcolonial eras (18).

There exists parallel evidence on forest spaces and conflict. This includes, most extensively, evidence of violent evictions as corollaries of deforestation programs; as a means to create, maintain, or expand protected areas and tackle encroachment by Indigenous and marginalized communities; and/or as a consequence of disputes over land tenure and access rights within the context of projects of scientific forest management and improvement. But there is additional evidence, for instance, relating to Colombia, of militia movements appropriating forest conservation ideas within their revolutionary nationalist programs, and on this basis engaging in coercive, if highly localized, forms of forest protection (72). There is extensive evidence of violent implementation of REDD and REDD+ (Reducing Emissions from Deforestation and Forest Degradation in Developing Countries) projects (73). And such dynamics often intersect with those arising from forests' character, or representation, as sites of danger, uncertain authority, and refuge (74, 75). Thus, in the India–Bhutan borderlands, a region plagued by decades of ethnic violence, forests have become important sites of both counterinsurgency operations and forced eviction and displacement of local communities, as the Indian forest department seeks to tackle encroachment (76). In Indonesia, as elsewhere, "REDD+ is accelerating the very violence and environmentally destructive behaviours it claims to discourage" (77, p. 136). And in Côte d'Ivoire, in 2016, more than 25,000 "illegal settlers" were forcibly evicted in Mont Péko National Park, with entire settlements and plantations being burned down without warning in the process, as part of a long-term plan to restore forest cover and biodiversity (78). As with water, such instances of violent conflict are part of a long-established pattern of violent forest management that can be traced back to the colonial era.

Paralleling this, internationally led responses to biodiversity loss have also been increasingly associated with violence. There is now an extensive literature on green militarization and the militarization of conservation, which documents the widespread use of military, paramilitary, and security actors and techniques—the use of private military companies, the training of park guards in counterinsurgency practices, the use of military surveillance systems and lethal force—to protect wildlife and police illegal wildlife crime (79–81). Claims such as those discussed above, linking poaching with terrorism, have been deployed to legitimize this militarization (80). For example, in Virunga National Park in the Democratic Republic of the Congo (DRC), the militarized and often violent enforcement of park borders has impeded local access to the park and its livelihood

resources, has enabled rebel groups to position themselves as protectors of these local interests, and has led to a convergence between the Congolese army and conservation authorities, with the result that park rangers have become direct targets of rebel attacks (82, 83). Meanwhile, in the northeastern parklands of the Central African Republic, the European Union–funded military training of park guards has had multiple negative consequences, with some of those trained subsequently joining the Seleka rebel alliance, which claimed power in the country in 2013 (84).

The environmental effects of mining and other polluting activities have repeatedly sparked or contributed to localized political violence, linked not to environmental changes in the abstract (as discussed above) but to arguments over corporate and elite interests and their responsibility for environmental damage and socio-environmental harms. This includes conflicts over the expropriation of and loss of access to land given over to mining activity (85); over parallel losses of access to water, or "water grabbing" (86); over the effects of mining and industrial pollution on soils, water, air, and human livelihoods and health (87); over the siting of polluting industries (88); and over fundamental political and value opposition to industrial extractivism, especially from Indigenous communities (89). Across these issues, the violence in question is, though sometimes bottom up, predominantly conducted by police, private security, and/or paramilitary actors against local communities and environmentalists, with mining operations being the number-one site of repression and killing of "environmental defenders" (42). For example, in the Cajamarca region of Peru, both state and private security forces have been implicated in the killing of local environmental activists opposed to gold mines, who, among other social and environmental grievances, have long mobilized to seek compensation for victims of a devastating mercury spill caused by corporate malfeasance (90). Protests following the 2015 Fundão tailings dam failure in Brazil—which unleashed more than 40 million cubic meters of mine waste, killing 19, and which is widely considered to be the country's worst ever environmental disaster—were met with repressive responses by state security forces (91). And from Amazonian Ecuador (92) to Canada (93) to the Niger Delta (94), a pattern of widespread conflict has emerged around the environmental consequences of oil extraction and pipeline infrastructures, including violent state security and police responses to Indigenous occupations and blockades.

Turning to policy and development interventions on climate change, here there is already abundant evidence of conflict linkages in three (overlapping) areas. There is, first, evidence relating to climate change adaptation and mitigation activities. In various locations, carbon offsetting projects have involved, or led to, violent conflicts over land rights and access, and the loss of attendant livelihood opportunities (95, 96), including as a result of REDD+ projects, already discussed. Land purchases motivated in part by climate change adaptation concerns have done similarly. In authoritarian contexts like Rwanda, the shift to climate-smart agriculture has been pursued in highly coercive ways (97). Increased dam building, pursued partly in response to climate adaptation and mitigation concerns, has led to widespread local anti-dam protests and violent state repression (67). Increased demand for minerals required for photovoltaics and electric batteries has led to local mining conflicts. And in at least two cases, such dynamics have contributed to violent national-level political conflict and change. In Paraguay, interests in expanded soybean production—promoted partly as a response to climate change—were central to the 2012 violence and subsequent soft coup against the government of then-President Lugo (98). And in Bolivia, interests around lithium production were central to the military- and internationally backed overthrow of the government of Evo Morales in 2019 following contested elections, as well as to subsequent protests, repression, and fatalities (99, 100).

Second, there is evidence that fears and narratives relating to claimed or anticipated climate change impacts are contributing to—or are legitimating—dispossession, militarization, and violence. In such cases, conflict is being caused less by climate change as an environmental variable

per se than by preemptive or exaggerated discourses on it. For example, Russia and to a lesser extent the United States have, since 2016, developed increasingly militarized postures on, and been increasing their military presence within, the Arctic, in anticipation of warming-induced changes across the region (101). In coastal southern Bangladesh, misleading narratives of land as about to be swallowed up by the sea are legitimizing pressures to abandon rice farming for shrimp aquaculture, accompanied by violent land grabs and livelihood reforms (102). In cities such as Karachi, Pakistan, people are being forcibly and violently evicted on the back of claims that their land is required for improved flood-risk management in response to climate change (103). Representations of dire climate security threats in Africa are, according to some analysts, helping to legitimate increased external surveillance of and military buildups across the continent, including by Western powers (22). And paralleling this, various authoritarian postcolonial states are invoking climate change to legitimate their own repressive, including counterinsurgency, activities (18).

Third, political differences over the existence, significance, causes of, and necessary responses to climate change are increasingly taking on violent dimensions. Climate protests have been met with violent state responses, and surveillance and criminalization of protest activity, across the Global North (104), including most notably in Germany in relation to ongoing coal extraction (105). For their part, some left-green actors now argue for strategic use of violence—or at least climate mitigation–justified property sabotage, or climatage—against fossil fuel interests (106), though there is not yet much evidence of this in practice. Climate change concerns have also become prominent within re-emergent eco-fascist discourse, featuring, for example, in the manifestos of the 2019 Christchurch and El Paso bombers (107).

The above suggests several conclusions. First, across the five environmental issues surveyed, there is extensive evidence of policy and development interventions in relation to them involving, or contributing to, violent conflict. This evidence typically takes a different form from that on environmental variations: It is mostly context specific rather than about general relationships or correlations, and it is mostly quite direct, in which the contribution of the environmental issue to violence is often beyond reasonable doubt (as, for instance, in cases of state repression during dam construction or climate protests). Being context specific, this evidence does not indicate that the environmental issues in question are always associated with the forms of conflict documented. There is no suggestion here that dam building always involves or contributes to violent conflict. On some issues, most notably mining, the precise contribution of environmental concerns to the conflicts in question is a matter of contention, and mediated by an array of contextual social factors (108). Nonetheless, and partly for these reasons, the evidence on policy and development interventions is much less uncertain, and much less contradictory, than it is on environmental variations. This evidence cuts across all five of the environmental issues surveyed, though it is particularly extensive in relation to climate change and water, and it cuts across all three types of intervention noted at the beginning of this section.

5. GLOBAL POLICY NARRATIVES AND INSTITUTIONALIZATION

Environmental security first garnered widespread public and policy concern under the Clinton administration, especially via the work of Homer-Dixon and its popularization by US commentator Kaplan (109), with questions of the conflict implications of environmental change being taken up by the State Department and Pentagon in particular. These institutional developments were premised on a standard first-wave understanding of environmental security that emphasized the potential for scarcity-induced conflicts and instability over key environmental resources, especially water. They also meshed well with US interests, arising during a moment of post–Cold War US hegemony; reflecting US military planners' interest in nonstandard threats to this order; and also

reflecting a view of the world focused on local or internal conflicts in the Global South to which the United States might take security measures in response.

The more recent rise of climate security concerns within international public and policy discourse also owes much to the US defense planning community: The earliest major scenario study on the subject was funded by the Pentagon (110), and the single most influential report on the implications of climate change for security—which framed climate change, famously, as a "threat multiplier" for instability—was authored by a group of senior retired US military figures (111). Yet in recent years a plurality of actors and sectors have embraced and institutionalized climate security discourse. Foreign policy, development, peace-building, and NGO actors have all voiced climate security concerns. New climate security–focused think tanks have been established, most notably the Center for Climate and Security in Washington, DC, while a number of existing think tanks, including the Berlin-based adelphi, the Clingendael Institute in the Netherlands, and the Stockholm International Peace Research Institute, have moved decisively into the climate security arena. These think tanks have spearheaded several international climate security forums, including the Planetary Security Initiative and the International Military Council on Climate and Security (112, 113). In turn, the security implications of climate change have, as of mid-2023, been the focus of nine UN Security Council debates (114), have been explicitly referenced in UN Security Council resolutions, and have been incorporated into the mandates of UN peacekeeping and political missions (114, 115). A UN Climate Security Mechanism has also been established to coordinate climate security risk assessments and response strategies within the UN system. Almost three-quarters of national security strategies published between 2008 and 2020 referenced climate change (116). Over the last decade and a half, there has in these regards been a very significant institutionalization of climate security concerns.

Yet in other respects the institutionalization of these concerns has been quite limited. Despite the widespread adoption of climate security language, this has not been accompanied by securitization as classically understood within security studies: It has not resulted in exceptional policy measures (117). Indeed, institutionalization has remained largely at the level of policy pronouncements, with limited translation into any on-the-ground initiatives (118, 119). In practice, most UN field operations have failed to integrate climate-sensitive programming into their work (115). And where climate security concerns have been integrated into programming, most notably within the development sector, there has often been a great deal of confusion over what this might entail (120). Divisions between those who see the UN Security Council as a crucial forum for action on climate change (especially the United States, United Kingdom, and France) and those who do not (especially China and Russia) have meant that climate change mandates and the precise role of the Security Council remain ill-defined (121). Moreover, even among proponents, climate security narratives have often been promoted less in response to climate security concerns per se than owing to political and bureaucratic interests in invoking climate change, or in highlighting the urgency of climate mitigation (122), such that fuller development or implementation of climate security programming has rarely been a priority. Last but not least, the institutionalization of climate security has been dominated by threat-multiplier and scarcity framings, and in particular by concerns with drought, extreme weather, and environmental degradation (116, 123). The most recent UN Security Council meeting on the subject held in June 2023, for example, was dominated by talk on how climate change is "diminishing natural resources, affecting social cohesion and driving conflict," especially in the Sahel region (124). There is next to no consideration in most policy fora of issues or perspectives that lie outside of such threat-multiplier and scarcity framings, and indeed a great deal of hostility to including them: Two of the coauthors of this article have experienced being disinvited or no-platformed from climate security policy fora when their views on the subject became known.

The treatment of other environmental issues within environmental security policy fora parallels this—except that these other issues have not been institutionalized to nearly the same degree as climate change. On biodiversity, the dominant policy framing has also conformed to a scarcity logic, viewing poachers as terrorists and suggesting that biodiversity loss is an "important driver of insecurity and conflict" that "increasingly impact[s] global peace and security" (125, p. 5). As indicated above, the evidential basis for such framings is extremely tenuous; they are promoted and reproduced less because of the strength of their supporting evidence than to legitimate militarized conservation approaches and support pitches for international donor funding (81, 126). That said, increased scrutiny and awareness over recent years of the counterproductive effects of militarized conservation, including extensive documentation of conservation-linked human rights violations, are now feeding into think tank and policy community narratives. The report just quoted, for instance, explicitly states that militarized responses to biodiversity crises are neither working nor desirable (125). Above all, the securitization of biodiversity has not yet been significantly institutionalized within international policy processes. The 2022 Global Biodiversity Framework, for example, includes nothing on conflict or security (127), and there have been no discussions of biodiversity and security within the UN Security Council, despite NGO lobbying for this (128).

On water, whereas US intelligence services periodically report on the potential global security implications of water scarcities (129), other countries have not done similarly. Several transnational networks and fora have produced work on water security and water for peace (130, 131). However, they have tended to frame their concerns in technical-normative or very generic terms—either by focusing on the potential for water to positively contribute to peacemaking or by taking human security as their referent without any deep consideration of water–violent conflict dynamics—and their work has not resulted in the development of formal policy mechanisms. The same applies to the UN Water Conference 2023, the outcomes of which were extremely vague on questions of conflict and security (132). Meanwhile, Security Council discussions of water have focused, perhaps appropriately, not on the contribution of water issues to international security but rather on the protection of water-related services and infrastructure during armed conflict (133).

Last, on mining and forests, though various governance initiatives have been developed to address and mitigate conflicts, these have developed separately from environmental security discussions and owe little to them. On mining, these have included the UN Global Compact on sustainable mining, Organisation for Economic Co-operation and Development guidelines, and a range of other corporate social responsibility initiatives, which set out voluntary standards on a range of issues, including for "conflict-sensitive mining." On forests, specific conflict-sensitive forestry initiatives have been developed in relation to Myanmar and the DRC, among others, but there are no overarching global frameworks, and the UN International Forest Principles and subsequent process around them include nothing on conflict specifically.

In sum, while there has in recent years been a significant institutionalization of climate security concerns, institutionalization of the other environmental issues considered here has been much more limited, and there has been no institutionalization of environmental security concerns per se. Moreover, even the institutionalization that has occurred has been dominated by a concern with the security implications of environmental variations, and especially scarcities. Within the policy narratives and fora analyzed above, there is little analysis of or policy formulation around the conflict or security implications of policy and development interventions vis-à-vis environmental issues. This pattern of uneven institutionalization is clearly not in line with the evidence previously surveyed.

6. CONCLUSIONS

In a series of withering assessments that are worth returning to despite being 20–30 years old, critics of first-wave environmental security thinking argued persuasively that there was little evidence in support of claims that environmental degradation and scarcity were contributing to wars; little logical reason to imagine that this would change fundamentally in the future; and little sense in Northern liberals, progressives, and environmentalists seeking to increase environmental awareness and action by tying their concerns to the emotive power of nationalism and apparatuses of state security. As Deudney and others observed, such a strategy may even prove counterproductive, undermining the globalist political sensibility that is so central to contemporary environmental practice (16, 134, 135). Despite the passage of years, these concerns remain just as valid as ever.

Yet these assessments also require updating and nuancing. Overall, the evidence on the contribution of environmental changes and differences, including scarcities, to violent conflict remains remarkably thin, especially in relation to the primary focus of first-wave discourse, large-scale civil conflict. However, there is stronger, if still uneven, evidence on the relations between environmental resource abundance and conflict linked to interests in developing, commodifying, and appropriating these resources for economic and political ends. And there is also extensive evidence of actions being taken to mitigate environmental degradation and destruction having wide-ranging conflict effects. Most environment-related violent conflict is of one of these types, the dominant form of environment-related violence being not biophysical scarcity induced, as per Homer-Dixon and the Malthusian tradition, but what Martinez-Alier (136) and other political ecologists call "ecological distribution conflicts," conflicts over the differential allocation and control of environmental harms and resources. These conflicts, though widespread, are typically dispersed, small-scale, and trans-local, very different from the large-scale forms of civil conflict imagined within mainstream environmental security thinking (though, as in the examples of Paraguay and Bolivia above, they sometimes do translate into national-level conflict).

Both public and policy narratives on, and the global institutionalization of, environmental security concerns are out of line with this balance of evidence. Across the range of environmental issues surveyed above, simplistic, depoliticized, and Eurocentric narratives of how environmental changes, and especially scarcities, may contribute to conflict and instability in the Global South continue to dominate global public and policy discourse and emergent policy processes. By contrast, there has been negligible engagement across these issues with the question of how policy and development interventions in relation to the environment—interventions to either exploit or protect it—are themselves contributing to widespread, if dispersed, forms of violence, including in the Global North. In addition, even on the issue that has seen the greatest amount of institutional innovation and development, climate change, the practical consequences of this institutionalization have been slim. Here, as elsewhere, environmental threats to security have often been highlighted less out of direct concern with this issue of security itself than as a form of signaling in relation to other issues (e.g., signaling in relation to climate mitigation). It deserves at least asking, in light of this, whether a greater degree of policy engagement with the question of the links between policy and development interventions and conflict—that is, a more explicitly politicized approach to environmental security—might not actually facilitate meaningful policy formulation and institutionalization.

The survey above also suggests some important differences, similarities, and lessons that might be learned between the five issues of climate change, water, forests and deforestation, biodiversity and conservation, and mining and industrial pollution. First, it is noteworthy that the above pattern of relatively strong and direct evidence on policy and development interventions, but at best inconsistent and indirect evidence on environmental variations, applies across the

five issues surveyed. Yet, second, there are distinct differences in the balance of research on these five issues. Most notably, whereas most research on climate change and security has focused on environmental variations as a cause of conflict, research on forestry, biodiversity, and mining has focused primarily on the conflict effects of policy and development interventions, especially resource extraction and/or protection. We suggest that climate security researchers and policymakers might usefully learn from research on forestry, biodiversity, and mining in this regard. And last, we wish to reiterate the point with which we began, namely, that there has in recent years been very little dialogue across, let alone comparison between, environmental issue areas, environmental security as a general thematic object of analysis having effectively disintegrated. We advocate much increased dialogue, comparison, and learning across environmental security's various issue areas and hope that this review inspires more such research.

To these conclusions, two qualifications are required. First, several points follow from our focus here just on violent outcomes, and lack of discussion of nonviolent, cooperative, or peaceful ones. This focus, we emphasize, does not mean that violent outcomes are the usual, or the more common, type of outcome. Moreover, this focus also means that we have not been able to explore, in the above, the specific political, economic, or environmental contextual and intervening factors that presumably explain why environmental variations and interventions translate into violent conflicts in some contexts but not in others. Notwithstanding our lack of discussion of these issues, they are of crucial importance, are explored within existing literature (108, 137), and should be considered within any future comparative research across environmental security's various issue areas.

Second, because this review has focused on existing contemporary and historical evidence, it has said nothing about the conflict implications of environmental variations and interventions in the future. This point gains significance given that it is sometimes argued, especially from Malthusian or threat-multiplier perspectives, that the scale and depth of environmental changes worldwide mean that lessons cannot be simply drawn from the past—as, for instance, in arguments that the end of climatic stationarity means that future conflict dynamics may be of a completely different order (138). Against this, others have pointed out that Malthusian reasoning has long approached the future as "another country. . .where the 'noise' of political economy can be blanked out," and speculation about looming conflicts can remain unhindered by evidence (139, pp. 154–55). Our assessment is that, although specific dynamics will of course change, contemporary and historical evidence probably provides a good guide and, in particular, that in the coming decades, policy and development interventions vis-à-vis the environment will probably continue to be more important than environmental variations in their causal contributions to conflict.

On this basis, we suggest a refocusing of both research and policy in three ways. First and most broadly, both mainstream research and policy should focus much more than they have on the conflict and security implications of policy and development interventions vis-à-vis the environment and move away from an exclusive or primary concern with environmental variations. Though politically challenging, we suggest that such a refocusing may actually help meaningful policy formulation and institutionalization. At the same time, we advocate increased dialogue and learning across environmental security's various issue areas. In particular, we suggest that research and policy on climate security—the dominant area of research within the field—might usefully learn from a fuller engagement with evidence relating to forests, biodiversity, water, and mining.

Second, much more work is needed on the environmental (or socio-environmental) consequences of violence, war, militarism, and, conversely, peacemaking. These issues have not been addressed in the above, but some closing comments on them are nonetheless required. For, although there already exists plentiful evidence relating to them—on the targeting of water infrastructures during war (140); on the impacts of this targeting on health and disease (141); on

the role of Cold War counterinsurgency strategies in the remaking of forest environments (74); on the impacts of civil war and post-conflict peace-building on deforestation, for instance, in Colombia (142); on the parallel impacts of armed conflict on biodiversity conservation (143); on the role of war logics in legitimating infrastructure developments and attendant environmental changes (144); on the politics of environmental disaster relief within counterinsurgency contexts (145); on the ways in which peace-building and peace processes can reproduce, or even worsen, environmental degradation and insecurities (146); on military global greenhouse gas emissions (147, 148); and more—this evidence is even more scattered than that discussed in the main body of this review. Especially given the apparent global increase in major wars, as evidenced at the time of writing by the ongoing acute violence in Ukraine, Myanmar, Sudan, Gaza, and elsewhere, there is urgent need for more research that investigates, compares, and synthesizes knowledge on the impacts of war and war preparation on the natural environment and environmental vulnerabilities.

Last, more research and policy consideration are in our view required on contexts of acute slow or structural violence that create or reproduce deep inequalities and vulnerabilities without leading to physically violent conflict, as well as on the arguably positive consequences of (some types of) environment-related violence. Most research and policy discourse on environment–conflict linkages is exclusively concerned with physically violent conflict, as against broader slow or structural forms, and approaches this violence simply as a bad against which security measures might be required. Yet both premises are questionable. Studies of trans-boundary hydro-hegemony (33), of racialized inequalities in water supply and precarity (149), of climate coloniality (150), and more broadly of environmental justice (151) all point to the widespread existence of forms of acute structural violence that are nonetheless widely naturalized and taken for granted, that rarely erupt into physical violence—and that thus fall outside, or are excluded from, most environment security discussions. Equally, certain forms of conflict, especially ecological distribution conflicts (152) and those that contest prevailing modes of environmental destruction (106), may potentially be considered positive, progressive, and necessary. In our assessment, the boundaries of environmental security discourse need loosening to include much fuller consideration of these crucial issues, in particular through increased engagement with research and activism on environmental justice.

SUMMARY POINTS

1. The literature related to environmental security includes some significant differences of interpretation, including over the meaning of security, the meaning of environment, and the appropriate theoretical premises, and research designs and methods, for studying their relations.
2. Research on climate security currently dominates the environmental security field, to the extent that environmental security as a general thematic and comparative object of analysis has for all intents and purposes disappeared.
3. Although both research and policy discourse on environmental security are dominated by a concern with the impacts of environmental variables on violent conflict, the evidence on these impacts is thin, weak, uncertain, contested, and/or contradictory, especially in relation to the primary focus of this research and policy discourse, large-scale civil conflict.

4. Scarcity accounts of environmental conflict, which focus on the security impacts of natural resource shortages, are particularly unconvincing. There is much stronger evidence that environmental resource abundance is associated with conflict and linked to interests in developing, commodifying, and appropriating these resources for economic and political ends.
5. Simplistic, depoliticized, and Eurocentric narratives of how environmental changes, and especially scarcities, may contribute to conflict and instability in the Global South continue to dominate global public and policy discourse on climate and environmental security.
6. There is extensive evidence of policy and development interventions vis-à-vis the environment involving, or contributing to, violent conflict. This includes evidence that actions being taken to mitigate environmental degradation and destruction are having wide-ranging, if mostly local, conflict effects.
7. Despite a significant expansion of policy interest in climate security in recent years, there has been little equivalent in relation to other environmental issues and no institutionalization of environmental security concerns per se.
8. The institutionalization that has occurred, most notably in relation to climate change, has mostly been limited to policy positions and statements, with limited translation of these into practice. In addition, institutionalization has been dominated by a concern with environmental variations, with little attention being paid to the security implications of policy and development interventions, despite the extensive evidence relating to them.

FUTURE ISSUES

1. More research is required that involves or facilitates dialogue, comparison, and learning across environmental security's various issue areas. In particular, climate security researchers and policymakers might usefully learn from research on forestry, biodiversity, and mining with regard to their understandings of environmental security dynamics.
2. Mainstream research should focus much more than it has done so far on the security implications of environmental policy and development interventions, including the implications of actions being taken to mitigate environmental degradation and destruction, and should move away from an exclusive or primary concern with the impacts of environmental variations on conflict.
3. There is urgent need for more research that investigates, compares, and synthesizes knowledge on the impacts of war and war preparation on the natural environment and environmental vulnerabilities.
4. The boundaries of environmental security research need loosening to include much fuller consideration of the links between environmental changes and interventions on the one hand and contexts of acute slow or structural violence on the other, in particular through increased engagement with research on environmental justice.

5. Researchers and policymakers should reflect on whether increased policy engagement with the question of the links between policy and development interventions and conflict—that is, a more explicitly politicized approach to environmental security—might not actually facilitate more meaningful policy formulation and institutionalization.

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AUTHOR CONTRIBUTIONS

J.S. conceived the overall framing, invited coauthors, and lead-authored the text. G.D., A.S., and J.S. led on climate change; M.Z. and J.S. led on water; A.D. led on forests and deforestation; E.M. led on biodiversity and conservation; and J.K.G. led on mining and industrial pollution. All authors contributed to framework refining, cross-issue comparison, and editing the article as a whole.

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