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Abstract: In debates of climate action, low carbon development has been widely advocated as an opportunity arising from climate change. This paper problematises low carbon development, arguing that there are undesirable, unintended or perverse effects that give rise to distinct and serious security concerns. The literature on climate security has addressed the effects of climate threats on conflict but there is a notable paucity of research analysing the security implications of responses to climate change in the form of low carbon development. The paper presents critical analysis of the ways low carbon development yields new security concerns as well as entrenching existing ones. Five dimensions of security are examined: spatially uneven effects of low carbon development; violent imaginaries of the global south and the production of 'ungoverned spaces'; non-violent yet harmful instances of conflict; marginalisation and dispossession; depoliticised, techno-managerial effects of resilience. The paper shows that climate (in)security manifests in variegated ways between different populations and spatial scales. Consequently, how, when for whom low carbon development becomes a threat or opportunity is socially constructed and deeply political.

Keywords: adaptation, climate security, conflict, fragility, imaginary, low carbon development, mitigation, power, resilience

1. Introduction

The United Nations Framework Convention on Climate Change (UNFCCC) and the Paris Agreement crystallise the global significance, ambition and requirements to deal with climate change. The UN Secretary-General, António Guterres, urgently called for action to deal with climate change in 2017 as it is “an unprecedented and growing threat — to peace and prosperity” but also “a massive opportunity that we cannot afford to miss” (Guterres, 2017). As this statement demonstrates, on one hand, climate change is often discussed as the ‘threat multiplier’ that can lead to conflicts and instability (CNA, 2007). On the other hand, opportunities of dealing with climate change are taking shape in the form of low carbon development, combining mitigation and adaptation strategies. With governments committing to Intended Nationally Determined Contributions (INDCs), calls have been made for a “ ‘decisive transition’ towards low carbon economies” spurred by international collective action (OECD, 2017:19).

Studies on climate security, and more broadly on environmental security, demonstrate numerous effects of changing environments. These studies provide diverging explanations on causal relations between environment and conflict/insecurity, characterised by a broad spectrum of approaches (Salehyan, 2008, 2014). However, there is a notable paucity of research analysing the security implications of the various responses to climate change, particularly in the form of low carbon development. This lack of attention is problematic when development paradigms have no choice but to face climate change and its impacts (Boyd et al. , 2009). After all in an anthropocene era, “what kind of nature gets produced is now the political question of our times” (Dalby, 2013a: 185). Therefore, there is a need to better understand climate security not only as a result of climate change but also as a result of mitigating and adapting to it. What are the security implications of low carbon development? Are they simply opportunities not to be missed without any dangers or risks? The purpose of this paper is not to discredit or deny low carbon development efforts, since we acknowledge their critical importance in dealing with climate change in many

parts of the world; but to question how, when, for whom low carbon development matters and the security implications it brings about.

The paper presents critical analysis of the ways low carbon development yields new security concerns as well as entrench existing concerns with problematic effects. Low carbon development can throw up inadvertent and undesirable effects-- and even intentional perverse ones-- on local communities and their livelihoods, ecosystems, the state and its stability. This study contributes to an emerging body of work on the interface of maladaptation and security (Adger et al., 2014; Haldén, 2007; Swatuk et al., 2018; Tänzler et al., 2013). The paper demonstrates how mitigation or adaptation efforts can produce and perpetuate spaces of danger, crudely dividing problems and solutions into those of the global north and south. In addition, such spaces tend to be regions and parts of society where burdens of reacting to and preventing climate change are experienced the most by marginalised groups - often through coercive means. The paper advances analytical development of climate security to incorporate these unanticipated or perverse effects as a result of addressing climate change. The significance of such advancement is that it allows further exploration of the political framing of climate change.

The rest of the paper is structured as follows. The next section defines low carbon development and identifies the critiques regarding its effects on social tensions and inequalities. These implications are related to the literature on climate security, which focuses on conflict and violence associated with climate change. The paper then presents five key dimensions of security for a critical examination of low carbon development and its implications: the spatially uneven effects of low carbon development (Section 3); violent imaginaries of the global south and the production of 'ungoverned spaces', demarcating spaces of insecurity (Hartmann, 2010) (Section 4); non-violent yet harmful instances of conflict, mediated through political control (Section 5); marginalisation and dispossession of groups within society (Section 6); and depoliticised, techno-managerial effects of resilience that evade addressing sources of contention (Section 7). Based on these arguments, section eight suggests productive

avenues to further climate security research. The paper concludes with the significance of low carbon development for climate security scholarship in light of global and national policies for climate change.

2. Problematising low carbon development

Low carbon development covers a range of economic growth approaches and carbon reduction strategies (Mulugetta and Urban, 2010; Urban, 2010). While there is no unified definition, reducing emissions or maintaining low levels is one of the key objectives while simultaneously seeking growth. This entails processes that: 1) change carbon production for more efficiency; 2) replace carbon with other sources; 3) refocus growth on different economic sectors and bring about structural changes in economy; 4) influence consumption through behavioural and lifestyle changes (Urban 2010). Definitions of low carbon development often tend to focus on developed countries and their possibilities for mitigation only. However, low carbon development may offer opportunities for developing countries as well, increasing access to alternative energy sources and avoiding high costs of a carbon-intensive economy amongst others (Urban, 2010). Adaptation is also part of low carbon development especially if understood not simply as technical responses to consequences of climate change, but as socio-political transformation with redistributive effects (Tänzler et al., 2010). Adaptation that is coordinated and governed across different actors can address views of vulnerable groups within society and provide distributive justice (Huitema et al., 2016). The United Nations Framework Convention on Climate Change (UNFCCC), which initially set out ideas on low carbon development, specify “forward-looking, climate-friendly growth strategies that can highlight a country’s priority actions for climate mitigation *and* adaptation, and a country’s role in the global effort against climate change [emphasis added]” (Clapp et al., 2010: 11).

In least developed country contexts, low carbon development can be particularly effective in areas of land-use change including agriculture and deforestation practices. In addition to land-use, electrification is considered another area where low carbon approaches can be applied at low cost (Bowen and

Fankhauser, 2011). Mainstreaming adaptation to development has been argued for more effectiveness, indicating that adaptation and development are interlinked (Ayers et al., 2014). However, these interventions are not necessarily without trade-offs. Mitigation and adaptation efforts may rely on land investments or large-scale infrastructure development that alter access to natural resources, giving rise to conflict if property rights or institutional mechanisms are not robust enough (Adger et al., 2014). It has been cautioned that low carbon development does not guarantee poverty reduction effects; in fact there could be no benefits to the poor and incur negative impacts to differentiated groups within society (Funder et al., 2009).

Indeed, existing studies on adaptation demonstrate growing evidence that maladaptation may further exacerbate existing tensions and inequalities between different parts of society (Adger et al., 2014; Eriksen et al., 2011; Magnan et al., 2016). These maladaptations highlight further vulnerabilities, often across a range of dimensions. They are not only environmental or socio-economic vulnerabilities but also extend to political, cultural or institutional dimensions. Moreover, maladaptation may affect those beyond the immediate locale of low carbon initiatives and have uncertain temporal manifestations into the future (Magnan et al., 2016). Attempts to avoid maladaptation itself could have consequences such that they could be 'adding insult to injury', leaving those vulnerable further exposed to harms (Marino and Ribot, 2012). The concept of divergent adaptation by Snorek et al. (2014) also points to new risks when adaptive capacity differs between groups in society. In their study of responses to climate vulnerability in Niger between pastoral and agricultural groups, they found that the adaptive capacity of one social group could be contingent on another. This leads to a situation where those with weakened adaptive capacity end up resorting to violence. Thus, adaptation can in fact, "bring about unequal access to entitlements, institutions and resources; change social networks; limit one's option to response to climatic hazards" (Snorek et al., 2014: 384).

However, the security implication of low carbon development has been hardly discussed. Climate security has generated multiple discourses, for example, on

dangers to the state and to individuals that are immediate and presenting existential threats. Other discourses are on risks that are diffuse and with impacts likely to manifest in the future. Climate security also involves discourses on resilience to external shocks (Dietz et al., 2016; Corry, 2012). While there is no agreed definition of climate security, it can be understood as, “a condition where people, communities, and states have the capacity to manage stresses emerging from climate change and variability” (Dellmuth et al., 2018: 3). It covers a very broad spectrum of policy areas from traditional security, diplomacy, peace and conflict, development, disaster risk reduction and refugees (Dellmuth et al., 2018), many of which are relevant for low carbon development initiatives. If reviewing low carbon development as an active strategy or an opportunity to pursue against the impacts of climate change, then climate security studies need to look beyond risks simply associated with events of drought, flooding or temperature rise.

The discourse of climate security is vital in shaping “who is in need of protection from the threat posed by climate change; who is capable of providing this protection; and (crucially) what forms responses to these threats might take” (McDonald, 2013: 49). By extending these questions to inadvertent, perverse, undesirable effects of low carbon development, it is possible to further deepen our understanding of measures of prevention or response.

The notion of security is relative and multiple discourses exist, highlighting multiple referent objects: the nation-state; people; international society; biosphere (McDonald, 2013; Gemenne et al., 2014). Studies hitherto have attempted to explain how climate change is associated with conflict, in particular violent conflict such as food (in)security correlated to riots and protests (Natalini et al., 2015; Kelley et al., 2015; Jones et al., 2017; Fjelde, 2015) or increased water insecurity as a conflict driver between and within states (UNEP, 2011; Homer-Dixon, 1999). Other studies examine when temperature or precipitation gives rise to increased incidence of communal conflict or interpersonal violence (e.g. Hsiang and Burke, 2014; Hsiang et al., 2013; Anderson and DeLisi, 2015; Hendrix and Saleyhan, 2012). Alternatively, studies have focused on

vulnerabilities of individuals and communities to better understand for whom climate change matters, often through increased burdens and erosion of vulnerabilities. These studies argue that climate risks are embedded in a range of factors such as ethnicity, class, gender, age, and associated political economy factors. Combined, they shape inequalities of resource access, opportunities for response, alternative livelihoods options and influence decision-making (IPCC, 2012; IPCC, 2014; Kurtz and McMahon, 2015; Adano et al., 2012; UNEP, 2011; Blaikie et al., 2004; Vivekanada, 2011; Goulden and Few, 2011; Raleigh, 2010; Okpara et al., 2015; Weir and Virani 2011). While this is not the place for a systematic review of climate security and by extension the environmental security literature (instead see recent reviews such as Adger et al., 2014; Brzoska, 2018; Forsyth and Schomerus, 2013; Gemenne et al., 2014; Ide and Scheffran, 2014; Lewis and Lenton, 2015), it is important to address the notable gap in analysing unintended or unforeseen implications of dealing with climate change.

There is nascent consideration of security implications for example by Haldén (2007: 107) who highlighted a “double boomerang effect” where action intended without harm such as an adaptation strategy may generate risk. Addressing this risk further creates other kinds of risk such that states would end up “binding themselves to the recursive nature of risk-generation” (ibid: 108). He contends that dealing with climate change, such as the militarisation of the Arctic territories, may throw up further risks of international conflict. Similarly, it has been suggested by Swatuk et al. (2018) that there are ‘boomerang effects’ where adaptation and mitigation bring about unexpected, perverse effects on communities through social, political, economic and ecological impacts, which then ends up “manifesting as threats to economic stability, state authority and/or ecological sustainability” (ibid: 5). They argued that the boomerang effect could destabilise the state in which mitigation or adaptation was taken or be transboundary, affecting another state.

These studies usefully highlight the temporal and spatial dimension of climate security. Furthermore, the study by Swatuk et al. (2018) points out that the

state is often the harbinger of insecurity itself when local level impacts, while unintended, are often deemed tolerable by the state, thereby passing on the burdens to local communities.¹ Nevertheless, these studies do not account for all security aspects of low carbon development and do not provide a full picture of those most needing protection from stresses and threats. Studies need to analyse the socio-economic, political and institutional conditions that underlie the perverse repetition of risks.

Policy debates have drawn attention to the need for more conflict sensitive adaptation to avoid the ‘backdraft’ of security risks, including violence and social and political contentions (Tänzler et al., 2013). More recently, the 2015 report, ‘A New Climate for Peace’, commissioned by the G7 governments noted that the unintended impacts of implementing climate policies required further attention (Rüttinger et al., 2015). While there is certainly a need to refocus attention to these knock-on risks and implications, it is crucial to redress underlying notions of violence and fragility—as we demonstrate later in section 4. If experiences of vulnerabilities are different across society, then analytical perspectives of those situated in developing contexts as well as from a cross-section of society is further needed to flesh out security concerns. There is a need to parse out how contentions emerge and better identify their security dimensions.

3. Uneven low carbon development

The unintended effects of low carbon development relate to the uneven effects of mitigation or adaptation measures. Low carbon development has been criticised for being typically couched in a narrow economic narrative excluding non-economic indicators, such as well-being. This renders the discussion on bridging development and climate action depoliticised and technocratic (Ficklin et al., 2018). Low carbon development initiatives are at the risk of implementing adaptive measures that “effectively [treat] climate change as an externality”, forgoing discussion on ecological factors and environmental dynamics (Brooks et al., 2009: 752). Climate mitigation efforts have also been challenged as being blinkered by patriarchal assumptions, utilising a masculine perspective particularly around inclusion/exclusion of participation and decision-making

(Boyd, 2002). The materialities of the resource itself used for low carbon development can also produce differences in how local communities and individuals benefit more than others. For example, small-scale hydropower projects under the clean development mechanism in Honduras enabled more development benefits to accrue in communities close to the project sites or to those that were able to provide reforestation areas. The context in which benefits are negotiated is highly localised and can intensify conflict over resources access (Newell and Bumpus, 2012). A broader perspective on the differentiated processes and outcomes of low carbon development assists understanding on how, when and for whom climate security matters.

Moving away from a carbon-based energy system generates geographical difference through alternative energy systems and the structures that support them. In her study of renewable energy transitions in South Africa, McEwan (2017) found that new territories were created where public and private actors could establish power and authority and extend infrastructure systems, often resulting in skewed access and allocation of benefits. Spatial differentiation gives rise to uneven development (Bridge et al., 2013). This is exemplified with climate engineering that alter precipitation patterns.² The trans-regional effects of climate engineering open up competition for strategic investments and potential conflict dynamics. Furthermore, producing a specific regional climate has political implications: investments in climate engineering could be a way to advance political influence by managing and altering trans-regional effects (Maas and Scheffran et al., 2012).

Uneven effects are bound up in the working of power so that insecurities manifest not only at international or national levels but also between and within communities. In their study of 11 case studies in the Middle East, the Sahel and the Mediterranean, Zografos et al. (2014) argued that interventions to provide certain aspects of security come at the expense of reduced human security due to unequal power relations between different societal groups. They underscored “the micro-politics of human security, i.e. the heterogeneous practices, thoughts, and the routines in which various persons and groups engage” for a nuanced

understanding of the political and economic dimensions of insecurity (Zografos et al., 2014: 332). Similarly, in assessing the difference of climate change vulnerabilities at the sub-community level in Bangladesh, Coirolo and Rahman (2014) identified that vulnerability is buffered by power exercised through networking with people of influence or by enforcing rights to resources for protection or expansion of livelihood options.

Low carbon development raises questions regarding the assumptions of the security-development nexus. This nexus ties together poverty, underdevelopment and insecurity. Moreover it is predicated on a notion that there can and *ought* to be a linear transition of development giving rise to security. The notion of security in the face of changing climate in developing countries may reinforce a supposed 'normal' progress, rejecting "deviation from the ideal typical imagination of what a successful nation state ought to be" (Shah, 2014: 132). Problematically, this process could merely be a reproduction of the insecurities it is aiming to combat (Shah, 2014; 2009). It is important to point out that the assumption of growth based on a neo-liberal agenda is not limited to developing country contexts and can be seen in examples of adapting to natural disaster in industrialised economies. In their case study of landslide disaster in south-west Italy, D'Alisa and Kallis (2016) analysed the way costly infrastructure was built in the name of adaptation only to enable citizens to continue living in a disaster prone area and for state investment to accrue. They argued that disaster capitalism, or the process of capital accumulation in the wake of a disaster, can occur through the consensus between state and civil society for options that would seek economic growth.

Grove (2010) makes a pertinent point about climate risk incorporated into development as something that goes beyond mere economic instruments and works as an apparatus of biopolitics and geopolitics proffering the global north. The effects of development agendas led by the UN and World Bank, which have taken up risk management and catastrophe insurance, have significant political effects that render life as an object of security. The implication of this biopolitical approach is that risk management or insurance is no longer "benign"

means of climate security (Grove, 2010: 541). Instead, they are used to “profitably manage a risky and emergent transactional economy between a disjointed ‘subject’ and its surroundings” (ibid: 546). Similarly, adaptation strategies can also target “those yet-to-be-made governable under the global neoliberal order”, thereby justifying coercive measures to discipline and shape these supposed dangerous populations (Bettini, 2014: 187). Biopolitics of climate change work in tandem with the geopolitics that sever the global north from the ‘undeveloped’ global south.

4. Violent imaginaries and ‘ungoverned spaces’

The severing of the global south from the north due to the dangers they pose is buttressed by discourses securitising climate change. The climate security discourse that foregrounds existential threats presents an alarmist portrayal of a violent world in need of urgent action to prevent future crisis (Stripple, 2017). Despite scholarship making it clear that “research to date has failed to converge on a specific and direct association between climate and violent conflict” (Buhaug et al., 2014: 4), governments of Australia, UK, Germany, France, India and China have placed, or have considered placing, climate change within the purview of the military (Gilbert, 2012). In particular, the US Department of Defense and intelligence community have investigated scenarios of climate change impacts since 2003 (Hartmann, 2010) and position climate change as a matter of national security (see Quadrennial Defense Review of the Department of Defense, 2010; 2014; CNA, 2007; CAN Military Advisory Board, 2014; Fingar, 2008; White House, 2015). When the security of the state is at stake, not only is it about abating climate-related crises but also the ways migration or terrorism get bound up in concerns of climate-induced conflict. Military intervention and spending on conflicts arising from climate change is conveniently justified (Brzoska, 2009; Gilbert, 2012). From this perspective, vulnerable, fragile or failed states abroad become a particular concern.

The urgency, then, is to identify factors that could threaten the current geopolitical order, or more specifically, the industrialised states (Diez et al., 2016). A stark distinction is made between the industrialised countries and the

periphery subject to them within a system of 'carboniferous capitalism' (Dalby, 2013a). The military sector that invokes climate security focuses on seeking immediate adaptive measures, rather than long-term plans of mitigation (Diez et al., 2016). Subsequently, development assistance and humanitarian aid become tightly intertwined with providing stability in fragile regions, further expanding the powers of the military. The effect is spaces of insecurity being produced: it is assumed that 'ungoverned spaces' are where threats emanate from (Hartmann, 2010). An imaginary of threat is created where ungoverned spaces are characterised by fragility, instability and conflict. Unhelpfully, it "reproduce[s] stereotypes of an uncivilised and dangerous other" (Ide 2016: 68). Moreover, actually reversing carbon emissions and changing tack in development processes become highly challenging. This is because it maintains "an imperial framework here in the specification of peripheral dangers to a metropolitan civilization, one that is worrisome indeed for anyone concerned to think about security beyond the maintenance of the geopolitical status quo that has caused the problem in the first place" (Dalby, 2013b: 41).

Here, climate security scholarship and environmental security studies more broadly are hampered by a salient analytical omission that does not afford a critical look into low carbon development. Despite the framing of the 'South' as violent or fragile, fragility is hard to define in concrete terms. In their study, Vivekananda et al. (2014) focus on both formal and informal institutions that fail to serve citizens and community members in areas of security and basic service provision. These institutions may lack the capacity or intention to uphold the rule of law for example. While this definition has merit in including not only governments but also locale-specific informal institutions, the concept of fragility is nonetheless heavily criticised for its biased normative underpinnings in the development literature. Nay (2014) offered a critique that the development and dissemination of fragility in global discourses is dominated by a Western interpretation of state-building that focuses on a permanent state with exclusive legitimacy to control its peoples and territory. Consequently, biased standards of good governance are set. Moreover, this notion furthers a donor-driven agenda that ultimately seeks to maintain an "international hegemony [that] is

... tied to their capacity to maintain a Westphalian order based on stable and predictable transactions among central government” (Nay, 2014: 228). Discourses on climate security that seek to maintain sovereignty and international order have hitherto been effective (McDonald, 2013). Coupling this discourse with the notion of fragility severely curtails the benefits of low carbon development for those in developing regions.

The notion of ungoverned spaces holds deeply problematic and unfounded notion of a growing poor population who, for example, might end up as climate refugees threatening international security (Hartmann, 2010). Development assistance is seen an antidote to abate escalation of conflict (ibid). The geopolitics of climate intervention is supported by what Chaturvedi and Doyle (2010: 220) call ‘imaginative geographies’ of fear and doom drawn up by “Northerncentric cartographic anxieties”. It thus ends up retaining the notion of impoverished regions and countries requiring assistance from industrialised economies.

These geographical imaginaries also put in place deeply problematic assumptions that those in the global south are irresponsible and incapable of environmental problems (Ide 2016). The effect is that the historical context of ecological degradation is obfuscated (Chaturvedi and Doyle, 2016). Such assumptions provide an easy excuse to couple with environmental determinism to portray a doomed fate of climate wars and insecurity riddled dystopia in places such as Africa (Verhoeven, 2014). But this portrayal misses the fact that this narrative is also groomed by African elites with vested interests in continuing to receive international support and tighten their grip on political power. The colonial narrative utilising environmental determinism are purposely reproduced in the postcolonial era such as in the case of Ethiopia so that “Ethiopian elites [profess] about the need for top-down development and tight political control, because ordinary famers cannot be trusted with the land or water” (Verhoeven 2014: 797). Selby and Hoffman (2014: 362) point out that environmental scarcity/abundance is a “state-centric political imaginary” that obfuscates the causes on contention. At the same time, this single-scale focus

overlooks the multi-scale political ecology of environmental problems. Consequently, states devise environmental policies, plans and governance mechanism that seemingly presents an orderly, cohesive approach within its territorial boundaries but ignores transboundary considerations (Ahlers et al., 2014). These points shed light on the fact that government mitigation and adaptation strategies such as green-grabbing may in fact be another form of state-building through which power is consolidated by elites (Camargo and Ojeda, 2017).

The effects of low carbon development are embedded in decision-making processes of access and allocation of resources, distribution of benefits as well as burdens. These processes are layered with socio-economic, political, institutional and cultural factors and thus highly contextual. Imaginaries of threats from violent, dangerous regions of the 'South' are not only simplistic notions but also those that conceal the political economy and political ecology that further entrench inequalities.

5. Covert conflict over low carbon development

Rebutting the application of ungoverned spaces requires a critical understanding of conflict. The notion of conflict is not well discussed in the climate security literature. Acute, direct violence is often used as an indicator of conflict (see e.g. Scheffran et al., 2012). There are studies that highlight 'hotspots' or 'risk areas' that are likely to be at the intersection of climate and instability (Sherbinin, 2014; Gemenne et al., 2014; Busby, 2017). Organising understanding around maps of hotspots or risk areas enables policy-makers and practitioners to prioritise and justify efforts. However, problematically, the baselines of analysis are set by data collected through global or 'northern' datasets, leaving little room to meaningfully integrate locally derived, grounded data and knowledge (Sherbinin, 2014). Recent studies also point to the English language bias to sample cases of climate and conflict, not only skewing our understanding but also potentially leading to maladaptive policy responses (Adams et al., 2018).

Moreover, as studies of resource allocation such as transboundary water have shown, conflict is —more often than not— non-violent and that these types of conflict perpetuate inequalities and unsustainable practices (Zeitoun and Warner, 2006). If acute violence is an indicator for analysing conflict, then it becomes difficult to capture incidents of non-acute or indirect violence and to examine them in relationship to climate change. It has been argued that cases of transboundary water management are better understood as coexistence of conflictive and cooperative actions (Mirumachi, 2015). This approach helps shed light on the power relationships, geopolitical drivers as well as the materiality of infrastructure that affect how actors engage with water resources management (ibid). In addition, compliance to unequal arrangements is often manufactured such that power asymmetry is not easily questioned (Zeitoun et al. 2011). O’Lear (2016: 4) calls these non-acute effects of such compliance slow violence, or “indirect, latent, neglectful human suffering resulting from particular actions or decisions”. If climate change is dealt in a way that depoliticises or universalises the discussion, then it benefits certain powerful groups of people and cause slow violence to others that is rendered as an inevitability (ibid). Understanding these forms of conflict and violence is particularly pertinent for low carbon development where unevenness of its effects is not only spatial but also temporal. In other words, communities may experience the burdens and trade-offs not immediately and instead in the longer term. For example, dams built as low carbon initiatives may cause incremental, latent changes to livelihoods that are not necessarily measured or monitored. Consequently, grievances may not be easy to identify in pre-project impact assessments or even post-hoc. Furthermore, in cases of slow violence, because suffering are purposely neglected grievances may be ignored when raised.

Conflict can thus be both overt ---as apparent violence-- and covert—as coerced consent and compliance. The causes of these are deeply associated with means of exerting political power to control access and allocation to resources (see e.g. Watts and Peet, 2004; Zeitoun and Warner, 2006; Zeitoun et al., 2011). Political expedience is one manifestation of the way power is utilised when low carbon developments are taken up in an opportunistic fashion. For example, in

Pakistan, political elites have portrayed dams as the “best adaptation strategy”, implying environmental threats are being taken care of, but in fact, these water infrastructures are arguably worsening political fissures within and between Pakistan’s provinces (Ahkter, 2015: 745). Dealing with flood disasters have also become part of political agendas of powerful Pakistani state actors: “the state addresses disasters (even) in conflict areas through the same processes of neoliberal marketisation, imperial expansion, and power and privilege that helped to create them in the first instance” (Siddiqi, 2018b: S164). In this way, the discourse of adaptation can be used effectively to promote vested interests. Elites can mobilise large groups of citizens and engage in conflict that benefits them by intentionally exploiting local grievances related to resource access exacerbated by the impacts of climate change. Insights from the Sudans and Kenya demonstrate government and non-governmental armies/forces playing to long-standing grievances between groups for recruitment and support (van Baalen and Mobjörk, 2016). In these processes, conflict can be overt and covert but nevertheless reveal power relations between institutions and actors that have much to gain or to lose from new low carbon interventions.

6. Marginalisation and dispossession

Assessing the winners and losers of low carbon development is challenged especially when the state of knowledge on the effects of climate change and variability on violent conflict is yet to be determined (Adger et al., 2014). Deligiannis (2012: 84) called it the “black box [that] are specific impacts on people’s livelihoods of environmental scarcities and people’s adaptations to them”. However, there are some hints to be gleaned. For example, natural resource scarcities exacerbated by climate change are examined in their relation to insecurities, such as intensification of terrorist group activities, (e.g. Mwiturubani and van Wyk, 2010; International Conference of Defence Ministers and Senior Officials, 2015; GRO, 2014). Studies like Adano et al. (2012:77) found that contrary to popular belief, in Kenya’s drylands “more conflicts and killings take place in wet season times of relative abundance, and less in dry season times of relative scarcity, when people reconcile their differences and cooperate”. The authors demonstrated that the determinant of violence between

poor and marginalised ethnic groups was the absence of social and governmental institutions to mediate tensions during the wet seasons, not the changing environmental conditions. These studies offer insight as to how the contentions around low carbon development has less to do with climate and more with pre-existing grievances, power struggles and practices of inclusion/exclusion in decision-making.

In sub-Saharan Africa, it has been suggested that the core factor determining violent outcomes related to climate change is political marginalisation (Raleigh, 2010) and those neglected communities blame and direct aggression to the government for climatic shocks (Detges, 2017). Without addressing power, adaptation can particularly affect marginalised groups and communities (Taylor, 2013). Problematically, states are not always held accountable to adaptation efforts, which is compounded by problems of difficulty in defining and measuring adaptation (Hall and Persson, 2017). In fact, dealing with climate change challenges state-society relationships such that the politics of climatic disasters defy generic processes through which outcomes of conflict can be associated (Siddiqi, 2014; 2018b). Issues such as citizenship become critical in dealing with welfare after disasters, as Siddiqi's (2018a) study of flooding in Pakistan showed. Thus, addressing grievances against the state requires measures such as conferring rights in the form of citizenship.

Low carbon development can exacerbate exclusion and marginalisation of specific communities and render them simply as 'wasteful lives' (Gidwani, 2003 in Yenneti et al., 2016). They are dispossessed of their livelihoods and resources redistributed "upwards to classes considered to be more capable (and therefore deserving)" (ibid: 97). The example of the large-scale Chranka solar park in Gujarat, India crucially reveals coercive measures of capturing land from those least able to rebuke compulsory asset acquisition and those without alternatives livelihoods. Such actions are made in the name of clean energy and progressive development. By deeming agricultural or pastoral land 'wasteful' and solar energy production more valuable, the government agencies further entrench marginalisation (ibid). Dispossession is not restricted to rural livelihoods and

extends to urban contexts such as that of municipal waste management in Mbale, Uganda (Silver 2018). Waste turned into compost becomes a way to trade carbon credits and utilise the clean development mechanism. Converting the waste dump into low carbon infrastructure has meant that those who relied on waste collection and picking had livelihood options denied. These waste-pickers, already at the margins of society and struggling to meet their needs for food, housing and education, face socio-ecological violence arising from dealing with climate change that only worsens their precarious lives (ibid). These examples hold pertinent lessons on the need to unveil effects of low carbon development in a critical light because dispossession and marginalisation do not 'just happen' and are purposefully enacted. Otherwise, simply coping to the adverse effects becomes normalised for marginalised groups.

7. Resilience as a technology of governance

Normalising the adverse effects of low carbon development can also be found in strategies of resilience. Low carbon development can be framed as a means to address climate risks and to build in precautionary measures. In these cases, low carbon development incorporates resilience based on the argument that climate change makes it impossible to maintain static conditions. Thus, dealing with external shocks and changes are necessary and development can strengthen resilience (Corry, 2012).³ Resilience is enhanced by learning through which local agency is exercised (Schilling et al., 2017). Resilience incorporates aspects of temporalities between past insecurities and future risks, highlighting complexity that cannot be dealt with simple technical fixes (ibid).

However, while resilience implies possible positive action towards improving the capacity to cope, adapt or learn, there are shortcomings. It has been reported that resilience may come at the expense of vulnerability at other spatial scales, as in the case of flooding in central Vietnam (Beckman, 2011). In addition, there are arguments that resilience could depoliticise disasters such that they are presumed inevitable and require coping and surviving to them: structural causes of disasters are ignored. Critical studies of resilience point out that concepts such as power need to be seriously engaged to avoid climate

interventions being depoliticised (Olsson et al., 2015). The inevitability denies political agency of people to counter and change conditions to avoid disasters (Schilling et al., 2017). Mason (2014) provided incisive analysis on the implications of UN agencies pursuing a human security approach to climate insecurities particularly in post-conflict areas. He contended that by taking a politically neutral stance in post-conflict situations, UN agencies have adopted techno-managerial measures to increase resilience against climate risks. Focus transfers from the “social and ecological conditions of life to the bodily or corporeal vulnerability on individuals” (ibid: 812). However, despite the intentions to address vulnerability, techno-managerial measures do not rectify the political conditions in which certain groups are marginalised or excluded in the first place from participating in and contributing to capacity building. The ‘neutral’ intervention aims to provide stability and order in a post-conflict context but in fact preserves the geopolitical conditions that give rise to social and ecological harm (ibid). By treating effects of climate change as inevitable, they are managed through contingent measures that emphasise preparedness and enhancing coping (Oels, 2013). Low carbon development becomes an instrument of such contingency with depoliticising effects.

Resilience may not be sufficient and instead entrench existing status quo and power relations (Pelling, 2011; Boas and Rothe, 2016). Importantly, it has been suggested that resilience needs to be socialised so that interventions such as the introduction of rights address historically and institutionally perpetuated inequalities and exposure to risk and vulnerability (Ensor et al., 2018). Otherwise, as Duffield (2007) sharply pointed out, resilience only serves to keep those populations where they are, halting them from encroaching on the global north, further feeding into the geographical imaginaries of the global south as mentioned in section 4. It is argued that the security concerns of these industrialised countries drive interventions: an intentional, purposeful set of actions that allow for “coercive measures to be applied on the unfit” under the guise of resilience (Bettini, 2014: 190). The perverse effects of using resilience as a technology of governance could be that low carbon development ends up

making 'ungoverned spaces' further ungovernable in reality and missing the mark on causes of harm.

This point has implications for policy that position climate adaptation and development as part of an integrated agenda of resilience (e.g. above-mentioned G7 report). The complex nature of climate risk means that development, humanitarian or peacebuilding efforts cannot take a siloed approach to deal with a particular effect of climate change. It requires a more detailed look at improving structures for development and livelihoods (see Henly-Shepard et al., 2018; Schilling et al., 2017). At the same time, these inventions cannot inadvertently normalise coping to harm.

Furthermore, there is much scope for scholarship on climate security to engage with ideas on the limitations of adaptation and resilience. Adaptation limits highlight that depending on the actor, tolerance for risk can vary and be dynamic temporally (Dow et al., 2013). Currently, the governance of adaptation is limited in addressing temporal changes of adaptive effects. Moreover, the complex factors contributing to such effects cannot be captured in a simple evaluation of adaptation (Ford et al., 2013). After all, "adaptation to climate change has the potential to leave some people behind while others manage to steer their livelihoods towards a more 'climate-proof' future" (Mikulewicz, 2018: 21). These points could help crystallise inadvertent effects of low carbon interventions and specify the variegated pathways of insecurities depending on individuals and social groups.

8. Furthering security analysis of low carbon development

As we have argued above, the focus of climate security should not only be on the climatic events but also on the interventions to deal with climate change, whether for mitigation or adaptation. The five dimensions of security implications demonstrate the variegated impacts of low carbon development. Climate security thus does not manifest in a universal way across different populations and spatial scales. How, when, for whom low carbon development is

an opportunity or a threat is socially constructed and deeply political. A critical analysis of low carbon development presents an insight into the power relations between industrialised regions and ungoverned spaces. Rather than equating this power asymmetry to a generic division between the global north and south, there are some promising lines of inquiry to further understand the way low carbon development is experienced.

As argued, patterns of uneven development differ spatially. In African countries, 'climate-resilient and low carbon development' calls for strengthening existing policies and practices but also physically scale up for the provision of low carbon energy (World Bank, 2015). Such emphasis on expanded infrastructure, whether it be in the form of hydropower dams, solar farms or geothermal facilities, will likely reconfigure space and change the flow of capital. The notion of territoriality by Bridge et al. (2013) can be a useful way to shed light on the ways social and political power is used to produce geographical differences in low carbon development. By focusing on territoriality, analysis of climate security can be more attentive to the variety and role of actors. Governments, military, paramilitary groups and companies can contribute to militarisation and marketisation of nature in the name of addressing climate change. While the existing literature warns of dangers, the notion of climate change leading to conflict can become a self-fulfilling prophecy if the mechanisms that enable "enclosure, territorialisation, and market strategies of accumulation by dispossession" are left unchecked (Dunlap and Fairhead, 2014: 955). Directing attention to spatiality and actors probes the distribution of power involved in managing 'opportunities' of low carbon development. This angle of territoriality can complement existing studies that demonstrate how vulnerability is affected by intersecting axes of power and marginalisation.

Another productive avenue of further research concerns the agency of climate security. Many of the examples above showed the central role of the government in implementing low carbon development and thus bring up the question of how state and non-state agency work in polycentric governance of climate change (Jordan et al., 2018). In a context where governments are looking to further

engage the private sector to achieve INDCs and Sustainable Development Goals, state and private sector relationships need to be further scrutinised. Private sector actors routinely operate in so-called 'fragile' regions and often in natural resource sectors whilst trying to assess complex social conditions in which their business activities are embedded. Low carbon infrastructure projects are often being implemented in developing countries but through businesses that are global and headquartered in the Global North. This creates a situation where host governments have an impetus on attaining foreign direct investment and the government may end up being the purveyor of risk and vulnerability to its people. Policy debates have begun to call for conflict-sensitive business practices (International Alert, 2005, 2015; Graff and Iff, 2014). It is argued that such practice would minimize the impact of businesses on local conflict dynamics with a better grasp on environmental, social and political risks. Examining conflict-sensitive practices can give better indications of private sector agency and its influence on government and local stakeholders and on the networks they establish with other actors. However, analysis should not only extend to business practices but also to the vested interests shared between the state, private sector and any middle-men or intermediaries. Power relationships need to be questioned so that conflict-sensitive practices allow for a better identification of stakeholder grievances.

Finally, noting that challenges of marginalisation and coercive practices of low carbon development, climate security can better address the uneven effects of dealing with climate change through concepts of accountability. Geographical and political economic studies on climate adaptation point to major structural problems of the capitalist system that continuously encourage resource extraction (e.g. Dalby, 2013a). White (2014: 846) goes further to argue that the global neoliberal structure condones "policy and practice that assigns responsibility for welfare, employment, consumption and resource use to the individual, that views accountability through the lens of the market". The increased efforts at global governance of environmental issues mean that accountability mechanisms with a state-oriented focus will not be sufficient, given the range of non-state actors like global businesses and transnational civil

society networks (Biermann and Gupta, 2011). Yet, accountability mechanisms of global governance may not be sufficient to grasp the political-economic dimensions of unevenness. Spagnuolo (2011) argued that legal measures such as global administrative law may be more advantageous to those in the global north, transposing a hegemonic set of rules and norms to the global south.

This is not to say that accountability mechanisms developed under a global governance framework are unsuitable. New projects of low carbon development that have an impact on indigenous communities could be better guided by The United Nations Declaration on the Rights of Indigenous Peoples (UN General Assembly, 2007). Analysts can be better attuned to the practices of applying global norms and instruments to specific cases, such as Free Prior Informed Consent. However, Dunlap (2017) argued that in Mexico, Free, Prior and Informed Consent for wind energy projects became a 'bureaucratic trap' which undermined indigenous autonomy, reinforced political and economic marginalisation and prioritised corporate interests. Gupta and Mason (2016) cautioned that transparency as a means to provide accountability can be privatised, constraining disclosure in a way that would benefit private actors and their authority, as well as be technocratised, narrowing focus to the design of accountability systems with less regard to their purpose. They argued that if information of risks is treated as private goods, then exercising the right to know, participation and making informed choices would be more difficult or exclusionary for some actors. Hence, it is worth critically examining these accountability measures for potential problems and bias in its application. Accountability mechanisms themselves may be part of the problem of unevenness.

9. Conclusion

The paper questioned how, when and for whom climate change matters when mitigation and adaptation measures sometimes inadvertently, at times intentionally, contribute to insecurity. By focusing on low carbon developments, five problematic security implications were considered: uneven low carbon development; violent imaginaries and production of 'ungoverned spaces'; non-

violent, covert conflict; marginalisation and dispossession; and depoliticising effects of resilience. Clearly, low carbon development is not value neutral or with benefits only. Undesirable, perverse and unexpected effects exist and could further deepen conditions of insecurity. By positioning low carbon development as deeply political, the paper offered new insights on the way climate security issues not only manifest but also are socially constructed and produced. Examining low carbon development raises questions about ungoverned spaces and where they lay. More importantly, it sheds light on the various mechanisms that attempt to contain such spaces. Particular scrutiny is needed on power structures embedded in any local context in which specific mitigation or adaptation projects are implemented.

As efforts to implement INDCs accelerate, policy will need to carefully highlight the implications of this course of action. The weak and contested evidence base on the impacts and implications of dealing with climate change leads to piecemeal and inconsistent policy uptake of findings (Peters and Vivekanada, 2014; Lewis and Lenton, 2015; Scheffran et al., 2014). Further systematic examination of security implications is needed as well as widening the analytical scope on climate security as we have argued. It has been suggested that a strategic narrative could help build buy-in to act on concerns of climate change from the public and other stakeholders (Bushell et al., 2015). A strategic narrative from a refreshed perspective of climate security could point to the risks and opportunities of low carbon development. Furthering climate security in this regard helps point out the problematic assumptions and potential blind spots in understanding inequalities of low carbon development. Refined climate security analysis could hold promise for challenging and changing the very structures and conditions in which low carbon development occur.

¹ Swatuk et al. (2018) point out that these impacts are possible to anticipate but nevertheless left unaddressed.

² Specific types of climate engineering cut across mitigation and adaptation, as classified by Boucher et al., 2013

³ The UK government, which first discussed climate security as an international agenda, has shifted its policy to take up the language of resilience in a major way

to aid developing countries and to foster international cooperation (e.g. UK government, 2018).

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