Climate War in the Middle East? Drought, the Syrian Civil War and the State of Climate-Conflict Research

Abstract:

Purpose of review: This article reviews existing evidence for a climate-conflict link in Syria and examines how the respective debate reproduces three important shortcomings of climate-conflict research.

Recent findings: The potential climate-conflict link for Syria can be conceived of as a four-stage process, with various levels of scientific evidence and consensus existing for each stage: (i) climate change inducing the heavy 2006-9 drought (plausible, but not proven); (ii) massive loss of agricultural livelihoods, significantly attributable to the drought (supported by a majority of studies, but contested); (iii) massive rural-to-urban migration triggered by livelihood loss in combination with other factors (supported by a majority of studies, but contested); and (iv) migration intensifying existing grievances and facilitating the onset of protests and the subsequent civil war (possible, but little knowledge exists)

Summary: The debate about the Syrian case reproduces three important shortcomings of climate-conflict research: limited dialogue between different methods, an overstatement of differences, and a lack of theoretical engagement. These shortcomings also have adverse impacts in terms of policy advice.

Keywords: climate change; drought; conflict; civil war; Syria; Middle East; migration

Introduction

> *So, kids, if you want to understand the politics of the Middle East today, study Arabic and Farsi, Hebrew and Turkish — but most of all, study environmental science.*
>
> Thomas L. Friedman [1]

The civil war in Syria has so far resulted in more than 300,000 battle-related fatalities, large numbers of civilian casualties and refugees, and significant regional instability [2]. The onset of the war in 2011 was preceded by an intense drought hitting the country between 2006 and 2009, which was at is most harsh during 2007 and 2008. As indicated by the introductory quotation, this has fuelled speculation by the media and by policy makers, including former US president Barak Obama and current UN Secretary General António Guterres, that climate change not only caused the drought, but was also an important driver of the subsequent civil war.

Researchers have also intensively discussed the existence of such a nexus in recent years. Gleick as well as Werrell et al. were among the first to hypothesise a link between climate change, drought and the onset of the Syrian civil war, while de Châtel contested such claims [3-5]. The study by Kelley et al. made the hypothesis both more credible and more well-known among scholars and wider audiences [6]. Further studies followed that supported or contested a link between climate change and conflict in Syria, although some remained ambivalent [7-10]. Recently, the debate was escalated by a paper by Selby et al., published in *Political Geography*, that heavily criticised proponents of a climate-conflict nexus for Syria. This was followed by three rejoinders by Gleick, Hendrix and Kelley et al., another reply by the authors of the original study [11-15] and a follow-up article by Selby [16]. Researchers have also speculated that the civil war and the resulting large-scale migration movements in Syria have caused immense environmental degradation, which could set the stage for future conflicts triggered by resource scarcity and livelihood insecurity [17]. Indeed, another major drought struck the country in winter 2017/2018, further undermining food security and rural livelihoods in the wake of immense destruction and with little adaptive capacity available [18].

Scholars have rightly pointed out that research on climate change and conflict has so far focussed on a few high profile and/or accessible cases – Syria being among them. For the research field as a whole, such a focus limits its ability to provide policy advice and raises questions about external validity and biased findings [19]. However, due to its high political relevance as a "canary in the coal mine" in terms of the security implications of climate change, and because it can illustrate the results of several quantitative studies finding a link between drought and conflict, the Syrian civil war will remain a "paradigmatic case" [20: 230] within climate-conflict research for the foreseeable future. The aims of this paper are hence twofold: Firstly, it reviews the scientific debate about the potential links between climate change and the Syrian civil war. Secondly, it explains how this debate exemplifies three key weaknesses of climate-conflict research and suggests ways to address these issues. The conclusion summarises the main findings and highlights how the identified weaknesses of climate-conflict research limit the ability of researchers to provide policy advice.

Climate Change and the Onset of the Civil War in Syria

Studies claiming that climate change played a role in the onset of the Syrian civil war tend to use four stages of argumentation (figure 1):

The first argument is that Syria experienced a major drought between 2006 and 2009. As "three consecutive dry winters […] combined to produce the driest three-year period in the instrumental

record" [14: 245], it seems unlikely that this drought can be explained by natural variation alone. Rather, it was very likely an expression of a long-term drying trend induced by climate change.

The second argument is that the drought hit the north-eastern, agricultural areas of Syria very hard, particularly the governorate of Al-Hasakah, but also Deir ez-Zor and Raqqa. In the absence of adequate local adaptation capabilities or external support, the regional agricultural and pastoral economy collapsed, leading to massive loss of livelihoods. According to a UN report, "some 1.3 million inhabitants of eastern Syria have been affected by this disaster, out of which 803,000 have lost almost all of their livelihoods and face extreme hardship"[21: 1].

The third argument claims that this loss of livelihoods and economic perspectives triggered a massive migration from the affected rural regions to peri-urban areas and the outskirts of major cities, including Aleppo, Damascus, Dara'a (often identified as the place where major anti-regime protests started in March 2011), Hama and Homs.

Finally, this massive migration aggravated problems related to social service provision and resource availability (e.g., jobs, education, food aid) in (peri-)urban areas. These problems were already severe prior to the drought due to a liberalisation of the economy, political mismanagement and the influx of more than one million Iraqi refugees. The related grievances resulted in a higher willingness to participate in anti-regime protests. The addition of heavy-handed repression by the regime and state fragility set the stage for the onset of the civil war in summer 2011.

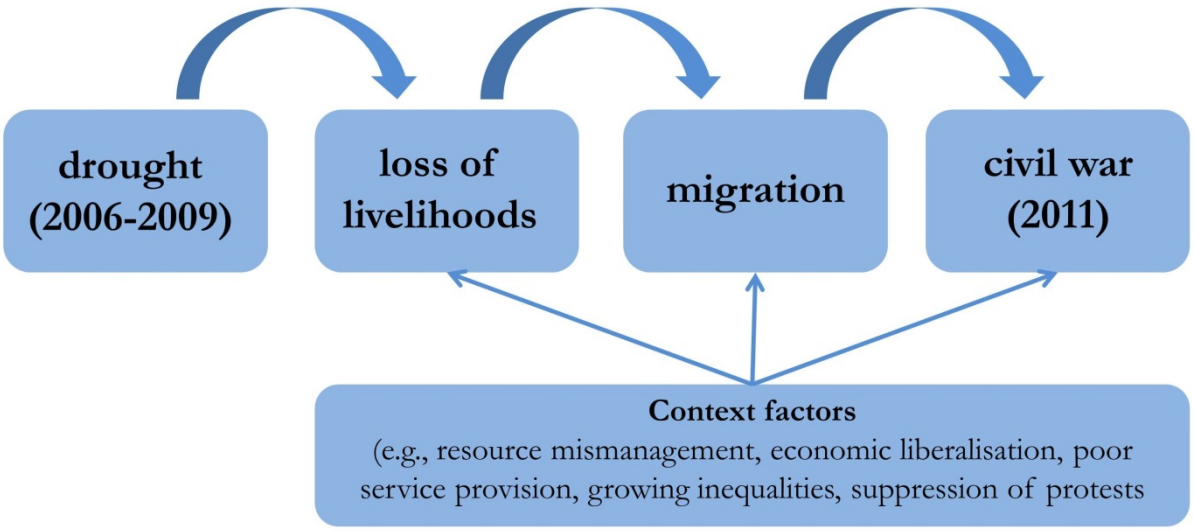

Figure 1: Alleged four-stage link between climate change and the onset of the Syrian civil war in 2011

Regarding the first stage of the link, connecting climate change to drought, it is consensual that the drought between 2006 and 2009 was unusually severe when compared to the historical record (Figure 2). Kelley et al. argue that this drought was part of a long-term drying trend in the region [6,14]. Selby et al. contest this claim [11], but other recent studies seem to support the position of Kelley et al. [22-24]. However, the question of attribution remains difficult. While the last IPCC report considered the attribution of droughts to human-induced climatic changes difficult [25: 871], rapid progress has been made recently in detecting whether extreme weather events are rendered significantly more likely by humanity's CO_2 emissions. The World Weather Attribution project, for instance, found such evidence for the 2017 Mediterranean heat wave, but not for a number of East African droughts [26]. While the study by Kelley et al. is a useful first step [6], more thorough attribution analyses for the 2006-9 Syrian drought would greatly enhance the debate.

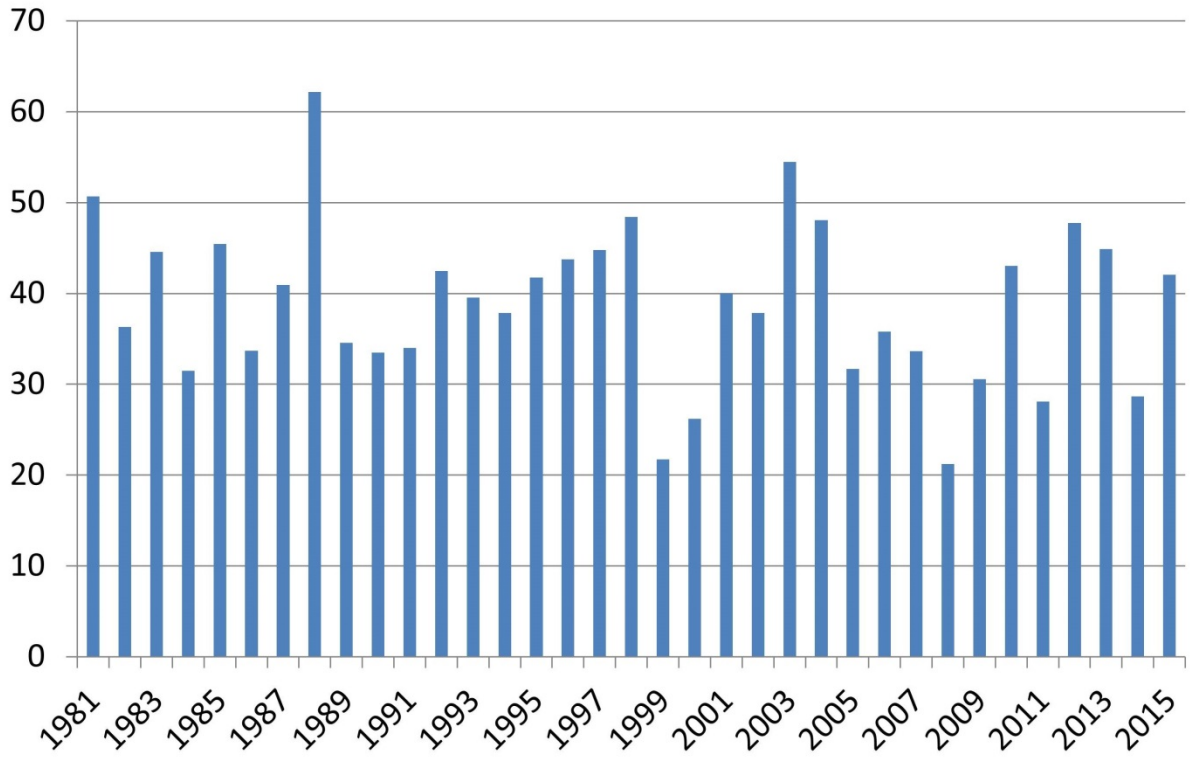

Figure 2: Winter rainfall (October-March) between 1980/81 and 2014/15 in Syria in mm, based on data from the World Bank [27]

When it comes to the links between the drought and the loss of livelihoods (stage 2), all available studies agree that a number of political-economic factors increased vulnerability to drought and undermined livelihoods, especially in north-eastern Syria. These factors include: the mismanagement and overexploitation of local groundwater resources, desertification due to

overgrazing, the liberalisation of the agricultural sector in the 2000s, the removal of fuel and fertiliser subsidies in 2008/9, inadequate and unequally distributed drought relief, and limited geopolitical support for Syria (e.g. additional water releases from the Euphrates dams in Turkey or international food aid). However, Dukhan, Femia &Werrell, Gleick, Kelley et al., Werrell et al. and to a lesser degree also Feitelson & Tubi and Weinthal et al. still argue that the drought added to and amplified the impact of these factors significantly, and was hence a main driver of livelihood loss [3,4,6-8,10,28]. de Châtel, Selby and to a certain degree Eklund & Thompson, by contrast, remain sceptical about the relevance of the drought for large-scale livelihood loss when compared with the political-economic factors mentioned above [5,16,29].

The third aspect of the proposed climate-conflict link, connecting loss of livelihoods to migration, is also far from universally accepted. All the above-mentioned authors argue that loss of livelihoods in rural areas was a driver of (at least in the mid-term) permanent migration to peri-urban areas and urban outskirts. But there are intensive disputes about the number of people that migrated. Kelley et al. argue that "[e]stimates of the number of people internally displaced […] are as high as 1.5 million" [6: 3242], a claim subsequently cited by other studies. Selby et al. reply that such numbers are "without foundation" [15: 254] and state 40-60,000 families as a more reliable guess (the reasons for these different estimates and their respective reliability is further discussed in the subsequent section).

The fourth and final relevant stage connects rural-to-urban migration to the 2011 protests and the subsequent onset of civil war. There is little doubt that the conflict between the Assad regime and large segments of the population was driven by range of factors, including discrimination against non-Alawite groups, heavy state repression, economic liberalisation and rising unemployment, poor public service provision, a widening gap between rich and poor (especially in urban areas), and the events of the Arab Spring in Egypt and Tunisia [30,31]. However, a highly contested point remains whether the migration flows played a substantive role in the onset of the civil war. One might argue that (a) the migrants had substantial grievances and hence joined the anti-regime protests, (b) the migrants contributed to (peri-)urban grievances by putting further strains of (already quite limited) public service provision and employment opportunities, and (c) migration and socio-economic pressures resulted in a large pool of deprived individuals who could be more easily recruited by armed groups once the fighting started.

While the last argument is firmly rooted in the climate-conflict literature, no one has formulated or tested it for the Syrian case yet [32]. Dukhan, who conducted interviews with tribal communities in Syria, identifies the collapse of the rural economy, accelerated by the 2006-9 drought, as a trigger for the 2011 uprising in tribal areas [28]. Basing her argument on field research and interviews, de Châtel also concludes that "the government's failure to adequately

respond to this crisis [loss of rural livelihoods and the associated migration] was one of the triggers of the protests that started in March 2011" [5: 532], thus implying that migrants joined the anti-regime protests. In contrast, based on interviews with Syrian refuges, Fröhlich argues that most migrants stayed passive or returned to rural areas once the protests started [9].

This debate, however, tells us little about whether migration might have contributed to general social grievances in urban areas. Kelly et al. imply such a link, but provide little concrete evidence for it [6]. Selby et al. highlight that the demands of the initial protests referred to political repression and a lack of democratic freedoms [11], but it is still possible that more general social grievances contributed to the mobilization of political protestors, especially as they were inspired by the preceding political revolutions in Tunisia and Egypt.

Taken together, one can argue that the 2006-9 drought in Syria is part of a long-term drying trend, but further detailed attribution analyses exploring the impact of anthropogenic climate change on the likelihood for such a drought are needed. The relevance (i) of the drought for the loss of rural livelihoods and (ii) of livelihood loss for rural-to-urban migration remains contested, especially relative to political and economic drivers. Currently, the majority of the studies support the existence of a significant drought-livelihood loss-migration nexus, but more critical voices also put forward convincing arguments [13]. Finally, the impact of migration to (peri-)urban areas on the beginning of the protests and the subsequent civil war is not well understood yet and requires further study.

The Syrian Case in the Context of Climate-Conflict Research

All the studies cited above have considerable merits in providing valuable information on potential climate-conflicts links in Syria. However, the debate on the Syrian civil war also illustrates and reproduces several key shortcomings in wider climate-conflict research. Three points are particularly salient in this context and can provide directions for future research, both on the Syrian civil war and on climate-conflict links in general.

Firstly, mutual acceptance and interaction between scholars using different methods is limited and there are few studies using both quantitative and qualitative evidence [but see 33,34]. Solow argues that there is a sharp divide between quantitative and qualitative scholars in climate-conflict research [35]. Ide picks up this claim by stating that the research field is dominated by quantitative studies and does not pay sufficient attention to qualitative evidence [36]. Scepticism by qualitative scholars towards statistical methods is frequently quite intense [37,38].

In their critique of studies claiming a climate-conflict link in Syria, for example, Selby et al. argue that statements about an existing, yet neither primary nor quantifiable link between climate change and conflict "are essentially unfalsifiable" [11: 233]. This is an important argument as

many proponents of such a link do not argue that the drought was a primary trigger for the onset of the Syrian civil war, but struggle to specify the importance of drought, especially relative to other factors. However, this argument only holds for single-case research designs. As soon as a multi-case comparative design is used, the relative (and primarily unknown) relevance of individual factors can be assessed with greater certainty.

A first step in this direction is the analysis by Feitelson & Tubi, which studies the conflict-relevance of the 2006-9 drought in six Middle Eastern countries [8]. Also, one might compare the 2011 protests with earlier, less violent instances of intrastate conflict (for instance from mid-2005 to early 2006) or previous intense droughts (for instance during the 1990s, see Figure 2) in Syria. Focusing on such less-violent or non-violent cases would also increase our understanding of peaceful adaptation to climate extremes, which is highly relevant to the design of adequate policy measures [19].

Going one step further, large-N, statistical analyses are well suited to revealing correlations (that indicate causal links) which are hard to observe and whose strength is not well-known or is weak, for instance between higher temperatures, aggressive individual behaviour, and small-scale conflict escalation [39,40]. But while there is considerable progress in quantitative climate-conflict research [41-43], the large majority of these studies focus on Africa [but see 44], so future investigations of the Middle East in general or Syria in particular would be worthwhile [19]. Certainly, these statistical analyses demonstrate a number of problems, such as poor data, inadequate models or a misspecification of control variables [36,45]. But cross-case, medium- to large-N studies are still able to enhance our knowledge of weak or indirect climate-conflict links, including in the case of Syria. The same is true for attribution studies on the 2006-9 Syrian drought and other extreme events (see above).

At the other end of the methods spectrum, most studies assume that the people who migrated to (peri-)urban areas due to livelihood loss had significant grievances against the regime and participated in the 2011 protests. However, knowledge about the motivation, capabilities and actual actions of these migrants is very limited. In this context, the in-depth, interview-based studies of de Châtel, Dukhan and especially Fröhlich are extremely helpful [5,9,28]. However, Gleick contends that given the small number of participants (n=30) in Fröhlich's study, "such interviews […] have no validity scientifically" [12: 249]. Such claims undervalue in-depth approaches to particular contexts, which can shed light on causal pathways, cultural contexts and human agency — factors often missed by quantitative approaches [46,47]. In sum, just like in climate-conflict research in general, opportunities for fruitful and policy-relevant insights are missed due to a lack of mutual acceptance between proponents of various methods in the debate on drought and the civil war in Syria.

Secondly, while there are significant disagreements within climate-conflict research [48,49], the differences between various positions are also often overstated (especially, but not solely when overlapping with methodological or disciplinary divides) [50]. Consequentially, possibilities for complementarity, mutual inspiration and scholarly compromise are missed. For instance, evidence that cattle raids in Kenya are more violent during unusually wet periods and that the onset of the civil war in Darfur was preceded by above-average precipitation has been interpreted as undermining arguments about climate-conflicts links in East Africa [51,52]. However, mixed-method research that draws on quantitative and qualitative evidence has shown that wet-season raids in Kenya can indeed be linked to previous droughts [53], while a landscape comprising both drought-affected and rainfall-abundant areas (adding up to above-average precipitation for the area as a whole) may have contributed to severe grievances in Darfur [34].

Similar polarisation patterns can also be detected in the debate about climate change and conflict in Syria. Consider the case of the number of people who migrated from the drought-affected regions to (peri-)urban areas. Kelley et al. claim that their number could be "as high as 1.5 million" [6: 3242] and further cite a UN-OCHA document stating that roughly 300,000 families were displaced [14,54]. Selby et al., using a variety of other documents, consider 40-60,000 families the best estimate [11]. As this estimate already includes regular rural-to-urban migration (a phenomenon well known in pre-drought Syria), the "'excess migration' must have been lower" [11: 239] They further argue that the estimate of 1.5 million people is based on a single and not particularly accurate source, while the UN-OCHA document provides no estimate of 300,000 families.

In this aspect (as in many others in this debate), both sides have taken starkly contrasting positions based on particular sources rather than searching for a more reliable middle ground based on the triangulation of different information. It is indeed correct that the 1.5 million figure has no empirical backing and that the UN-OCHA document nowhere refers to 300,000 families [54]. And while this criticism by Selby et al. is pretty straightforward, Kelley et al. still do not acknowledge it in their rejoinder [14]. However, according to another UN-OCHA document, 36,000 displaced families roughly equals 200-300,000 displaced individuals [21]. Based on a more reliable estimate of 40-65,000 displaced families [54], this would add up to approximately 332-539,000 persons that migrated from the drought affected areas.

In addition, Ali argues that the estimate of 40-65,000 families already refers to the excess migration and hypothesises that "the real figures are likely to be much more than what is stated in the official numbers" [55: 7]. Finally, these numbers were usually stated between late 2009 and early 2010. As we know that mid- to long-term migration of entire families is often a last resort coping strategy[56], many more families are likely to have migrated by the onset of the Syrian civil

war in early 2011 (especially as the dry 2010/11 winter put further strains on rural livelihoods, see Figure 2). The UN, for example, provides an estimate of 50,000 families (around 277-417,000 individuals) for the year 2010 [57].

In sum, the figure of up to 1.5 million refuges used by Kelley et al., but also by Femia &Werrell, Feitelson & Tubi, Gleick, and Werrell et al. is almost certainly overstated [3,4,6,8,10]. But it is still very likely that several hundreds of thousands of additional people migrated from the drought-affected areas to the outskirts of urban centres. This number is more significant than implied by the estimates provided by Selby et al. and could have had considerable negative impacts on social service provision and resource availability [11]. Overstating such differences (and not triangulating existing information) makes it harder for scholars not (yet) familiar with the field and for policy makers to draw on relevant insights. One way to resolve such issues could be mediated meetings that enable scholars to identify areas of agreement and origins of disagreements, such as the recent workshop on climate change and security by the Woods Institute for the Environment [58].

Thirdly, climate-conflict research could improve existing theoretical approaches or help in the development of new ones. It is true that researchers have made innovative theoretical contributions to climate-conflict literature, for instance by drawing on the strategy of war literature [59] or by using ethnographic and political ecology perspectives [46,60]. However, "in general, the quantitative comparative literature is weak on theory, and explanations for observed patterns […] are often made *post hoc*" [61: 270]. Case studies also frequently either refer to empirical findings from other studies or to the theoretical ideas developed by Homer-Dixon two decades ago [50].

The debate on climate change and the Syrian civil war would also benefit from more theoretical engagement. The analyses by de Châtel, Femia & Werrell, Gleick, and Kelley et al. do not draw upon, and indeed barely refer to, wider theoretical debates on climate security, environmental conflicts, civil wars, and conflict dynamics [3,5,6,10]. The study by Selby et al. and the follow-up study by Selby make several brief theoretical references, but largely provide an empirical critique of the climate-conflict link in Syria [11,16]. Fröhlich strongly draws on social movement theory to show why migrants were unlikely to initiate the protests, but does not consider the possibility that they subsequently joined protests or the armed resistance [9]. The positive exceptions in this debate are Feitelson & Tubi, who develop a comprehensive theoretical framework outlining physical, geopolitical and internal factors to explain why severe drought facilitated intense conflict in Syria and, to a lesser degree, in Iraq, but not in Israel, Jordan, Lebanon and Turkey [8].

Such a lack of theoretical engagement impedes the ability to learn from past debates or to inspire future discussions beyond the narrow question of whether drought contributed to the onset of

civil war in Syria or not. The debate surrounding the Syrian case can draw on several theoretical debates as well as contribute to those debates. For example, the position of de Châtel and Selby et al., who argue that a purported natural disaster was primarily produced by political and economic factors at various scales, fits well with political ecology approaches [62]. Similarly, Gleick and Kelley et al. could draw on theories connecting environmental stress to reduced opportunity costs for participating in conflicts to strengthen their claims [32], while Fröhlich's findings challenge such theories to some extent.

Conclusion

This article firstly reviewed the available literature on climate change and the onset of civil war in Syria in 2011 while considering four stages of a purported causal link: climate change to drought, drought to livelihood loss, livelihood loss to migration, and migration to conflict. Although Syria faced a multi-decadal drying trend and the 2006-9 drought was unusually severe, comprehensive evidence through attribution studies of a (probabilistic) link to climate change is still lacking. Whether the drought was a relevant cause of rural livelihood loss and whether this livelihood loss facilitated a significant migration to urban areas remains contested, although the majority of studies support these claims. Currently, we know little about whether, and if so how, this migration contributed to the onset of the anti-regime protests in 2011 and the associated civil war.

What is clear from the existing literature, however, is that even if the 2006-9 drought played an important role in the chain of events leading to the onset of the civil war, the fact does not depoliticise the conflict. There is a broad consensus that the inadequate reactions of the Assad regime to existing political, economic and ethnic tensions, to the drought, to the rural-to-urban migration, and to the initial, legitimate protests were the principal drivers of the conflict.

Secondly, the paper showed how the debate surrounding the Syrian case illustrates and reproduces three important shortcomings of climate-conflict research: limited dialogue between proponents of different methods and a lack of acceptance of contrasting approaches, an overstatement of differences rather than a triangulation of findings and search for a reliable middle ground, and a lack of theoretical engagement.

These shortcomings are not only an issue in the scientific debate, but also have adverse impacts in terms of policy advice. Limited dialogue between researchers using different methods and a lack of theoretical engagement are obstacles to disentangling the complex causal chains and multiple context factors relevant for a potential climate-conflict link [61,36]. Ultimately, policy makers might be less interested in whether climate change was linked to conflict in the specific case of Syria rather than in the (causal and context) factors relevant to preventing climate-related

instability in the future [63]. Furthermore, an overstatement of differences runs the danger of facilitating the kind of instrumental and technocratic politics that draw on whatever stream of the scientific debate is most suitable to legitimising their specific interests. German and US climate change doubters, for instance, have misused critical arguments regarding a climate-conflict link in Syria to claim that climate research in general is founded on prematurely drawn conclusions [64,65].

Addressing the abovementioned shortcomings will improve knowledge on climate-conflict links in Syria, but will also advance wider debates about the security implications of climate change and increase the ability of researchers to provide policy-relevant advice.

Conflict of Interest Statement

The author states that there is no conflict of interest.

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