

Hydro-climatic change, conflict and security

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Abstract Climate change is likely to increase the frequency and intensity of water-related hazards on human populations. This has generated security concerns and calls for urgent policy action. However, the simplified narrative that links climate change to security via water and violent conflict is wanting. First, it is not confirmed by empirical evidence. Second, it ignores the varied character and implications of hydro-climatic hazards, the multi-faceted nature of conflict and adaptive action, and crucial intricacies of security. Integrating for the first time research and findings from diverse disciplines, we provide a more nuanced picture of the climate-water-security nexus. We consider findings from the transboundary waters, armed conflict, vulnerability, and political ecology literatures and specify the implications and priorities for policy relevant research. Although the social effects of future hydro-climatic change cannot be safely predicted, there is a good understanding of the factors that aggravate risks to social wellbeing. To reduce vulnerability, pertinent democratic and social/civil security institutions should be strengthened where they exist, and promoted where they are still absent.

1 Introduction

Concerns about the implications of climate change for security through its impact on hydrological resources have been expressed at the highest political level (Obama 2009; Ban 2007; UN Security Council 2011). However, research has still not established a causal link between hydro-climatic variability (or water scarcity) and international or civil violence (Wolf 2009; Buhaug 2010). Alarmist media messages and political exclamations may be exaggerated (Nordås and Gleditsch 2007). Even so, there are complex ways in which hydro-climatic change, conflict and security interact and a multitude of threats to social welfare beyond war and communal violence. For example, not only violence, but also social and

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political conflict matter and security concerns extend to political instability or large population dislocations.

The objective of this article is to unpack this complexity, map out its causal structure and evaluate the state of our knowledge through a critical review of current knowledge on the complexity and explanation of the climate change and security nexus. We benefit from an exhaustive literature review and incorporate the preliminary insights of the European Commission (EC) funded Framework Programme 7 (FP7) research project Climate Change, Hydro-conflicts, and Human Security (CLICO) (www.clico.org; Ludwig et al. 2011).

The next section presents the dominant way in which climate change, water and security are problematized and argues that it is over-simplified. Section 3 reviews and evaluates the contribution of four relevant bodies of literature for understanding better the climate-water-security nexus. Section 4 outlines a more complicated causal model emerging from the literature and discusses research gaps and priorities. Complicating the picture is crucial both because claims of simplified links between climate change and security are well-established in the public imaginary and gain credit in policy cycles, and because this allows us to identify problems that typically escape political and analytical radars. Section 5 concludes with policy implications.

2 Climate, water and security: the simple view

Media and policy reports regularly assume a particular simple causal structure linking water, conflict and security (Fig. 1): hydro-climatic change causes water scarcity which in turn increases conflict, and hence impacts negatively upon national (and human) security. In a positive feedback loop, more insecurity can cause more conflict and vice versa conflict breeds insecurity. Adaptive action is needed to reduce the likelihood of conflict and/or increase security. Although not always stated, such nexus accounts tacitly equate hydro-climatic hazards with water scarcity and conflict with violent conflict, i.e. the intentional use of threatened or actual physical force resulting in death, injury, psychological harm or deprivation (WHO 1996). Similarly, they mostly identify security with either a generalised notion of “being protected from or not being exposed to danger” (Barnett 2003:7) or national security.

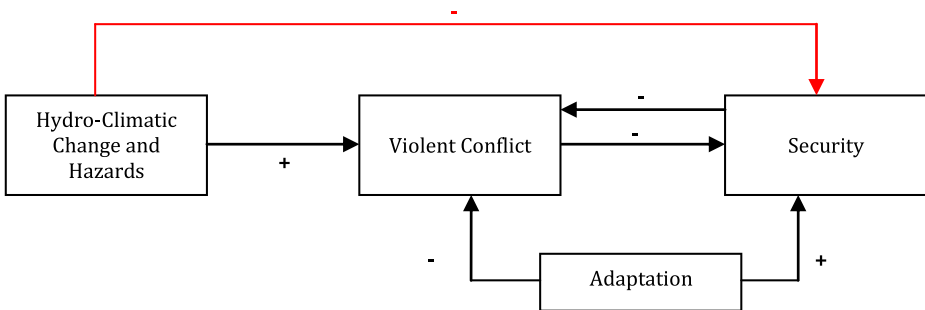


Fig. 1 Graphic illustration of the simple narrative linking climate change to security via water scarcity and violent conflict (*red line* indicates the direct impacts of floods or droughts on human security independent of conflict) A ‘+’ sign means that the two components change in the same direction, e.g. an increase in conflict causes an increase in insecurity, and a decrease in conflict a decrease in insecurity. A ‘-’ sign suggests that they move inversely, i.e. an increases in one decreases the other

Five observations can briefly make the case that this over-simplified narrative that has dominated public debate is seriously wanting:

First, climate and security are not linked only through violent conflict. Droughts or floods threaten the security of communities also directly via physical or economic damage, dislocation of people or effects in food supply (red line in Fig. 1).

Second, water scarcity is not the only natural hazard of concern. Droughts, floods, sea-water rise (with saline water intrusion to groundwater or flooding of lowlands) may destabilise societies in different ways and in differing time-frames. There are also subtle differences within each hazard that determine the spatial and temporal characteristics of impacts: for example, aridity, an average effect, is not the same as drought, a temporal aberration compared to social expectations (Kallis 2008). Flash-floods differ from normal floods, etc.

Third, conflict is a multi-faceted phenomenon. Conflict can be armed or non-armed and violent or non-violent (e.g. political conflict, protests). It can be bad, but also good, such as when it instigates progressive institutional change. It can be visible or hidden and it can take place at various scales from the international down to the inter-communal, or conflict within households, as revealed in gendered aspects of water access (Crow and Sultana 2002). Conflict can trigger cooperation,¹ but also cooperation can mask conflict (Zeitoun and Mirumachi 2008).

Fourth, there are varying scales and understandings of security: national security (protection of borders and institutions of nation state), human security (protection of individuals from danger and fear) (UNDP 1994) and the older notions of social security and civil security/protection, that have been particularly important in dealing with crises and disasters.

Fifth, a wide variety of technical and institutional measures may qualify as “adaptation” ranging from dams and desalination plants to water markets and pricing reforms, to changes in entitlement schemes and land-use controls. Not all are *necessarily* benign. Some responses in the name of adaptation can make more harm than good to vulnerable parts of the population, or they can increase carbon emissions. This has been called “mal-adaptation” (Barnett and O’Neill 2010).

Therefore there is a need for more complicated understandings of the causal routes linking climate, water, conflict and security. Fortunately, there are a variety of communities of research with relevant findings (Table 1) and to their contribution we turn next.

3 What we know from the literature

3.1 Transboundary basins and water wars

This field examines relations between hydro-climatic factors, conflict and adaptation at the national scale (Table 1). Findings suggest that cooperation trumps violent conflict by far, and that acute disputes involving violence are very limited with the only evidence for a genuinely water war pointing to an event 4,500 year ago (Wolf 2007). Countries sharing rivers engage more in disputes (Gleditsch et al. 2006) but when separating the effects of shared border and shared water the significance of the latter is reduced (Toset et al. 2000).

¹ Cooperation is understood here as positive, collaborative interactions in pursuit of common and individual benefit.

Table 1 Main communities and lines of research on climate change, water and conflict

Line of research	Disciplines	Scale	Questions	Methods	Policy recommendations
Transboundary (International) water relations	Geography International Relations	International	Do nations go to war over water? How to design good transboundary agreements? Which are the international basins most susceptible to conflict?	Qualitative case-studies Quantitative and qualitative analysis of datasets of treaties and disputes	Improve transboundary governance and institutions.
Climate, water and armed conflict	Political Science Economics	International Intra-national (civil wars)	Does climate change or water scarcity increase the likelihood of international, civil or domestic violence? Which other factors affect the likelihood of violence?	Large-N regressions of violence, hydro-climatic and socio-economic indicators	Economic development and spread of democracy reduce conflict.
Vulnerability studies	Geography Environmental studies Physical and Human Geography Hydrology	Domestic National Regional Local	What determines the comparative vulnerability of different regions, groups and sectors to hydro-climatic change?	Qualitative case-studies Indicator-based comparative assessments	Direct aid and preventative action to more vulnerable areas and develop institutions and local capabilities there.
Political ecology of water	Human geography Sociology Anthropology Ecological economics	Multi-scalar ("global") Local	How does social power affect access and use of water and related conflicts? How is access to water and vulnerability distributed along lines of class, gender and ethnicity?	Qualitative case-studies	Correct injustices perpetuated due to economic growth and market expansion. Address power asymmetries and injustices in international or domestic relations.

Drought has no influence on disputes but the size of the basin does, suggesting that water abundance and related economic opportunities (e.g. hydropower) may be causing conflict (Gleditsch et al. 2006).

What accounts for this relative lack of hydro-scarcity conflict? Institutional arrangements seem to mitigate the risk of conflict (Tir and Stinnett 2012) depending on the design and efficacy of international water treaties. Countries with larger shared basins and larger GDP and population differences are more likely to enter a treaty agreement (Song and Whittington 2004). Compensations and side-payments are a common treaty mechanism in water quality agreements, but not in water quantity ones (Dombrowsky 2007). In a climate change context, resilient treaties adopt portfolio approaches that spread uncertainty risks by including diverse management arrangements simultaneously in open-ended strategies rather than rigid, codified rules (Drieschova et al. 2011). Also, transboundary water management institutions that are unable to absorb and effectively manage change—which points to the importance of time given to absorb change – as well as large or rapid changes in a basin’s physical (e.g. dam construction) or political (e.g. breakup of a nation) setting can be two key conflict-likelihood increasing factors (Wolf 2009).

However, a more critical perspective on institutions and cooperation questions binary distinctions between cooperation and conflict and problematizes institutional ‘solutions’. The term hydro-hegemony refers to the covert use of power by a State to perpetuate water-sharing arrangements that while on the surface appear cooperative are in practice inequitable and unreasonable, yet tolerated and stable as they are not readily challenged (Woodhouse and Zeitoun 2008). Selby (2003) holds that Israelis and their neighbours do not fight over water; rather the Israeli Administration uses control of scarce water as a tool for subjugating Palestinians.

If water wars are unlikely, then why the media and policy hype? First, water may not be a cause of war *yet* but may become in the future due to climate change (De Stefano et al. 2012). Second, wars may not be fought over water, but caused by consequences of its scarcity, e.g. rising food prices or scarce arable land (Serageldin 2009). Possible wars related to land-grabs are a case in point. Finally, although unfounded, statements about water wars may persist because some key actors—policymakers, academics, journalists, and NGO activists—have incentives to exaggerate their probability (Katz 2011).

3.2 Climate, water and armed conflict

This field uses large-N datasets of countries or regions to examine correlations between hydro-climatic variability and civil conflict, controlling for socio-economic and political factors. Although under certain social conditions they might aggravate the risk of conflict, scarcity and climate change are overall not found to have an important association with armed conflict, especially if compared to poverty and dysfunctional institutions (Gleditsch 2012).

Lower rainfall levels and negative rainfall shocks are more associated to increased conflict risk in sub-Saharan Africa (Miguel et al. 2004), though the specification of rainfall intervals of the study has been criticised, and the result is not robust to different specifications (Ciccone 2011). In a similar study, Burke et al. 2009 find that global warming, could increase probabilities of armed conflict incidence in Africa by 54 % until 2030, but due to temperature increases, not rainfall changes. These results too are sensitive to the time period and severity threshold used and are not reproducible with alternative specifications (Buhaug 2010). Other studies conclude that climate variability is a poor predictor of armed conflict (Hendrix and Glaser 2007). Political exclusion of ethnic groups rather than a drought-conflict nexus drives conflict, and this is not influenced by drought occurrence, suggesting that water may not even be a threat multiplier (Theisen et al. 2011).

This literature has mostly focussed in Africa, since the prevalence of rainfed agriculture makes more likely there a link between climate, water and violent conflict. Global datasets that go beyond Africa confirm that climatic variability does not associate with violent conflict (Koubi et al. 2012); the link between climate, growth and conflict is contingent on the political system, with non-democratic countries facing higher risks. Extreme events such as flash-floods and intense storms negatively associate to GDP growth but not to the likelihood of armed conflict (Bergholt and Lujala 2012). A study that uses damage—instead of hazard—level variables finds that climate-related natural disasters decrease, rather than increase, the risk of civil war (Slettebak 2012).

Whereas most of this research focuses on armed conflict, the latest research on conflictive and cooperative events at the domestic, instead of the national scale, including violent and non-violent conflict, concludes that changes in demand-side drivers such as population growth, urbanization, and agricultural development have an impact on the risk of water conflict risk, while supply-side factors like climate change do not (Bernauer et al. 2012).

The large-N literature suggests also that economic growth and democracy are essential attributes of human security. Interestingly, whereas authoritarian regimes have less domestic water conflict than democracies, they have more *violent* conflict (Bernauer et al. 2012). Democracies in other words allow low-level conflict to be expressed and resolved avoiding violence, while autocracies stifle only for it to erupt as violence. Continued emphasis on climate and resources risks may crowd out attention and intervention in the most crucial leverages, such as poor governance and poverty (Slettebak 2012). Worse, framing climate issues as security concerns also risks creating a “self-fulfilling” prophecy, if perceptions affect also the actions of implicated parties (Gleditsch 2012).

3.3 Vulnerability and disasters

Vulnerability research acknowledges that, exposure to hydro-climatic risk and hazards is differential and distributed along lines of geography, income, age, gender, and ethnicity. Vulnerability mediates hazards and impacts and multiple, both physical and socio-economic stressors, influence it. The same meteorological event can have very different impacts depending e.g. on soil conditions or the type and spatial arrangement of regulating hydraulic infrastructure. Athens in 1992 for example was vulnerable to a climatic drought because of a prior period of fast urbanization and economic growth that emptied its reservoirs (Kallis and Coccossis 2003). Vulnerability analyses seek to either measure or qualitatively explore vulnerability determinants by investigating reasons behind unequal exposure.

A major line of work looks at indicators of physical vulnerability and social adaptive capacity, e.g. to droughts (Alcamo et al. 2008) and floods (Lehner et al. 2006). Drawing on risk-hazard models or “outcome-oriented” approaches (O’Brien and Wolf 2010), studies conduct vulnerability assessments typically at the national or regional scale, although recently other scales have been considered. For example, Bruggeman et al. (2011) assess drought vulnerability at the provincial level and find that the wet mountainous and rural areas of Cyprus are much more vulnerable than the more arid urban-coastal areas, because depopulation has reduced the capacity of elder farmers to cope with extremes.

Another line of research uses case-studies to examine causal structures of unequal vulnerability by looking at the context and processes that produce it. Recent frameworks consider “double exposures” to both climatic and economic (e.g. globalization) conditions and seek to articulate potential pathways of interaction between natural and human-made hazards (Leichenko and O’Brien 2008). As Dalby (2009) notes climatic changes combine with broader changes in land-use (e.g. urbanization) and the metabolism of societies through

economic growth and global trade, or broader geo-economic developments such as globalization and economic crises to produce vulnerable and insecure people and places.

Recently, a values-based approach to climate change vulnerability (O'Brien and Wolf 2010) has posited that climate change and responses to it might influence differentially things valued differently by different individuals, groups, or societies, and hence generate value conflicts as to e.g. what sort of insecurities and vulnerabilities should be prioritised with preventive policies. The approach questions policy decisions based on cost-benefit analyses and value exclusions and advocates value-inclusive processes of adaptation. Research reveals that flood boundaries are contested with practical implications for defining flood status and consequences for involved actors (Walker et al. 2011). By expanding the timeframe of the examination of vulnerability beyond the actual disaster event, studies find that vulnerability is crucially intertwined with ways in which recovery is managed (Whittle et al. 2010).

3.4 Political ecology

“Winners” and “losers” and the distribution of costs and benefits of socio-environmental change are the focus of political ecology, defined as the study of power over access and use of resources (Watts and Peet 1996). Political ecologists consider the expansive metabolism of societies and the uneven processes of globalizing capitalism. Together with the uneven distribution of power, these are seen as the fundamental causes of the unequal distribution of vulnerabilities and insecurities.

Political ecology has thrown light on the distributional and conflict aspects of new water technologies and institutions (Castro 2004). For example, it has been shown that adaptation technologies, such as desalination may introduce new vulnerabilities by increasing greenhouse gas emissions, inducing urban growth, producing brine discharge and chemical pollutants, increasing water prices, and shifting geopolitical relations of water security (McEvoy and Wilder 2012). Price reforms also, which have been promoted in the name of adapting to climate change and water scarcity, have impacted in some cases the most vulnerable social groups for whom water is an important component of household budget (Bakker 2004). Social protest and confrontation are often the results of market reforms. Urban water political conflicts around privatization and price hikes are common in Europe (Sauri 2012). In some parts of the world protests against water privatization have been repressed violently, most notably in Cochabamba, Bolivia.

Conflict over water is often an expression of conflict over the control of land (Swyngedouw 2007; Selby 2003; Otero et al. 2011). The practice of large land-procurement schemes (“land-grabs”) by nations or corporations in poor, frequently African, nations where the crops involved are often water-intensive and the importers water-scarce nations, is a source of mal-adaptation. Foreign investment regularly occurs in areas of informal, customary property rights and involves resource dispossession from disadvantaged groups, intersecting with previous inequalities and communal conflict (Peluso and Lund 2011), possibly producing new vulnerabilities and conflicts (Milman and Arsano 2012). In the longer-term, and in a context of global food or water shortages, foreign land procurement schemes run the danger of becoming the foci of civil or international tension and conflict. Also, land grabs may play out as inter-state or corporate conflicts at the international level, when they involve challenging hegemony over virtual water resources and consequently international agro-food commodity trade flows controlled by powerful agribusinesses (Sojamo et al. 2012).

Political ecologists have highlighted the potentially positive role of conflict when disadvantaged groups struggle against governments and corporations for their rights (Martinez-

Alier 2003). In oppressive situations, conflict, may help reduce vulnerability and improve the adaptive capacity of disadvantaged groups. “Adaptive conflicts” between herders and farmers in the Western Sahel have pushed for political change and State action to legitimise mobility, a vital adaptation strategy for drought-hit herders (Turner 2004). Likewise, the conflict and violence involved in the Arab Spring may contribute to a transition towards democracy, which could also address vulnerabilities. Some researchers have argued that the Arab revolts were linked to drought and to the rise of grain prices (Johnstone and Mazo 2011). Econometric studies confirm a link between droughts and democratic transitions for sub-Saharan countries (Bruckner and Ciccone 2011).

Finally, political ecologists have taken issue with alarming climate change, scarcity or security discourses. They show how for example scarcity discourses are often mobilised to promote technological fixes, such as desalination plants, which mask underlying problems and spawn additional risks (McEvoy and Wilder 2012). Political elites holding key institutional roles use water supply “emergencies” (e.g. droughts) to renew arguments for additional hydraulic infrastructures as effective policy responses (Giglioli and Swyngedouw 2008). Key for exploiting drought and flood emergencies and achieving unequal outcomes are social constructions of changing hydrological conditions as “natural hazards” (Bakker 2000) or “natural crises” (Kaika 2003), and conceptualisations of water supply crises as “state failures” (Bakker 2003). Such powerful knowledge-power formations are instrumental in bringing in deregulation, market liberalisation and privatisation, and establish particular sorts of environmental rule (Peet et al. 2011). They also provide opportunities for key capitalist institutions, such as the insurance industry, to pursue profit and reproduce conditions essential for their existence (Johnson 2011).

A similar argument has been made against securitizing discourses. National security discourses in relation to environmental problems prioritize military solutions as policy means (Grove 2010). There is a danger here, especially if conflict is considered as an unequivocal destabilizing force, to indirectly legitimize violent state repression of environmental or social protests. Similarly, the discourse on human security may legitimise international development or intervention policies which are themselves often at the heart of insecurities (Dalby 2013), or individualized hazard responsibility and privatized risk prevention and insurance that do not always reduce vulnerability (Grove 2010). A concern here is how particular framings of problems privilege some views of security (e.g. national, human) against others (e.g. social), and in particular how the shift to human security and individual/community responsibility plays in the hands of discourses that call for the dismantling of the welfare state that guaranteed social security in the face of crises (D’Alisa and Kallis 2012).

Political ecology focuses on injustice and power asymmetries and is critical of economic growth or the export of Western-type development, which are seen to cause inequality, intensify vulnerability, and generate conflict (Kallis et al. 2009). The findings of this research favour adaptation through more equitable distributions of power and a more deepened democracy.

4 New understandings, new questions

Figure 2 attempts to capture graphically this complicated picture and offers a new mental map to substitute the oversimplified narrative of Fig. 1. From the vulnerability literature it takes the insights that: first, there are not only climatic, but “double” (geo-political, geo-economic) exposures; and, second, environmental and social/institutional features mediate

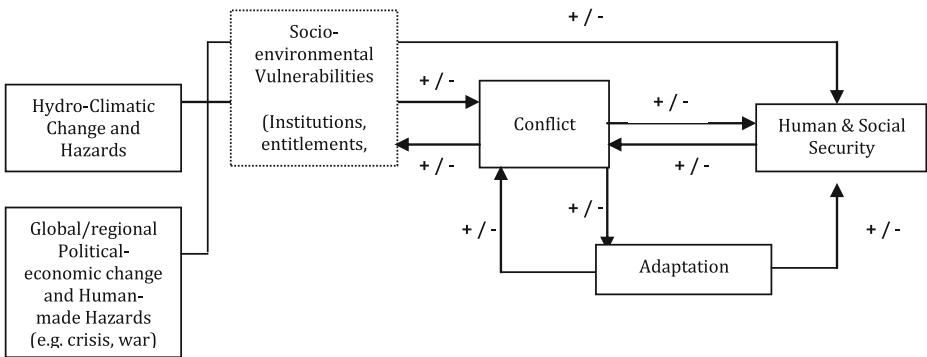


Fig. 2 A complicated understanding of the climate-water-security nexus

such hazards/exposures and their consequences on security. From the transboundary and armed-conflict literature it takes the recognition that: institutions mediate hazards and conflict or security; and, that good institutions may lead to less conflict and more security. From the political ecology literature it takes the insights that: adaptation may cause conflict and undermine security; conflict can be good and not only bad; and, social security should not be subsumed under human security.

A key finding of this literature review is that violent conflict over water is rare, and that there is no association between climate variability and likelihood of violent conflict. Nevertheless, statistically speaking, lack of evidence of a link does not mean exactly evidence of a lack of a link. Also the future may not resemble the past; extreme climatic change and variability in the future, unlike whatever we have seen in the recent past, *may* generate violent conflict. Unfortunately, we can only speculate about this. One thing is sure: the case for violent climate-driven water conflict as a security threat is over-blown. And violence is never the outcome of nature alone, so rather than climate the focus should be on institutions and social-political relations.

Beyond climate-triggered violent conflict there is a wider spectrum of problems and insecurities that merit attention. Already in Fig. 1 we noted the direct threat of climate change to human populations and their security (red line). Figure 2 adds the importance of factors that increase or reduce vulnerability. In addition, Fig. 3 deciphers other causal routes that might be of concern. First, violence, such as wars for example, instigated by geopolitical or geo-economic stressors create vulnerabilities that then make parts of the population more susceptible to direct damages from hydro-climatic change. Think of war refugees here susceptible to floods. Rather than climate change and water scarcity threatening human security, it is political and economic factors that generate vulnerabilities that threaten the security of populations (Selby and Hoffman 2013).

Second, if good institutions reduce conflict and enhance security, it follows that the dismantling of good institutions increases the likelihood of problems. We have a pretty good understanding of the types of institutions that improve security at the transboundary level, but less so at the national-domestic level. Democracies improve security, but why and how? Is it “development” and “democracy” in general that improve security, or more specific and concomitant institutional features, such as strong social and civil security systems, better health care provision, and resilient infrastructure for all? If so, what may be the implications of the weakening of social security systems and civil protection mechanisms for future human security in the face of hydro-climatic change?

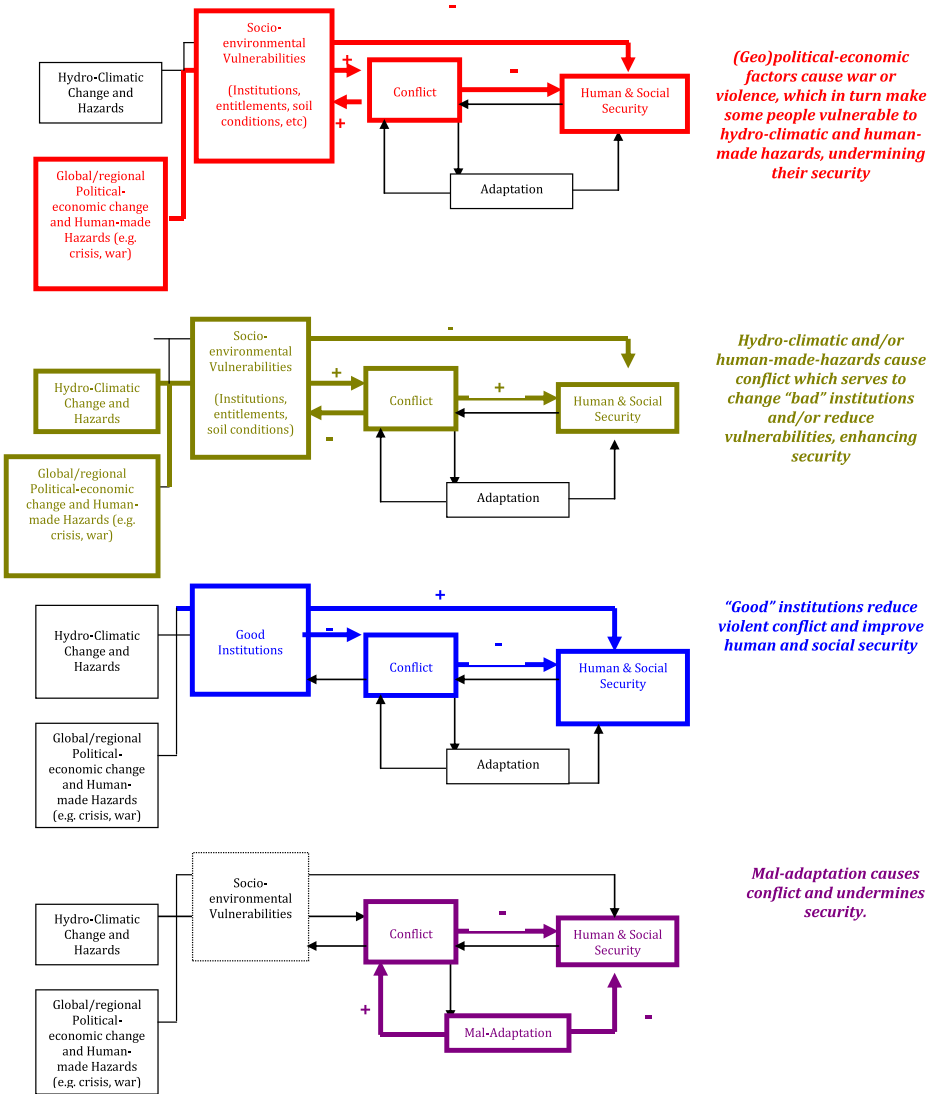


Fig. 3 Four different causal routes that are important for human and social security

Third, in certain instances conflict may change institutions and/or reduce vulnerabilities in ways that enhance human security. This is not about soft/political conflict being good and hard/violent conflict being bad. Even violent conflict, such as the Arab revolts, may have had socially positive effects. The question here is when and under what conditions, what type of conflict may be good? And may hydro-climatic change contribute to positive social conflict?

Fourth, certain adaptation interventions may generate conflict (mostly non-violent, but also potentially violent as in the case of contesting land-grabs or large dams). Mal-adaptations may also increase the vulnerability and undermine the security of certain parts of the population, e.g. those displaced by a dam built in the name of adapting to climate change. The question here is why, when and how do governments choose mal-adaptive

policies. It is important to understand how socially controversial and conflictive projects may be reframed by certain governments as “adaptation” measures.

Finally, let us note issues and questions of space and scale that cannot be captured in a two-dimensional graph. Specifically, what is good at one scale (e.g. national) may be bad at a different scale (e.g. human). A large dam that increases energy and national security may undermine the human security of local communities at its vicinity. This calls for multi-scalar analyses, or at least analyses and conclusions aware of the contingencies and implications of their scalar choices (Cook and Bakker 2012).

Moreover, whereas most analyses of hydro-climatic change and conflict/security tend to focus on spatially-confined units (nations, regions, cities, communities), effects of concern may travel through space with large disjunctures between the locations and timings of the hazard and of its consequences. We know very little about indirect ways in which hydro-climatic stresses contribute to conflict and insecurities through:

- i) grand-scale population dislocation and migration,
- ii) long-term changes in land-uses, locally or cross-border,
- iii) damage to crucial infrastructures and effects on global commodity chains.

The large-N literature which addresses indirect effects has not accounted for long-term or far distant effects since it tests the association of hydro-climatic and conflict variables for the same area and year (or for limited time lags); spill-over effects escape it. Similarly, although environmental change may not directly affect migration decisions that much, it can indirectly do so by influencing economic drivers of migration through changes upon average resource availability and pattern variability, or lower employment opportunities in labour-intensive sectors vulnerable to change, e.g. agriculture (Foresight 2011). Vulnerability studies focus on settled communities and do not capture the effects on/from moving populations or commodities. Qualitative case-studies of the political ecological sort could be mobilised to this end but, instead of place, these should be people or commodity-based, e.g. follow migrant populations dislocated by droughts and floods, or follow the impacts of regional droughts on strategic commodities (e.g. grain) through their commodity chain.

5 Policy conclusions

Climate and water alone are not causes of violent conflict, unless perhaps under very extreme conditions. Water scarcity may aggravate social conflict through the food production chain, but we still know very little about such links. However, we do know that hydro-climatic change poses an important threat to human security through direct impacts on economies and livelihoods, independent of the conflict channel. Framing hydro-climatic change as a national security and military concern not only diverts resources from where they are most needed, but also runs the risk of a self-fulfilling prophecy. Technological and institutional regulations of water, often in the name of climate change adaptation, are sources of tension. Such conflict is not necessarily bad; often it is constitutive of positive social change and leads to policies that address the needs of the most vulnerable and disadvantaged populations.

Although we cannot safely predict the social effects of future hydro-climatic change, we know the factors that aggravate the likelihood of conflict and the risks to social welfare. Poverty, inequality, lack of effective democracy, and lack of access to basic infrastructures of health, social and civil security, increase vulnerabilities and insecurities. In our view, a precautionary

policy of “no-regrets” should prioritise the strengthening of democratic and social/civil security institutions where they exist, and the promotion of their establishment and expansion where they are absent. Solving existing conflicts and addressing inequality-driven grief will also go a long way towards reducing future risks. In this sense, climate change does not raise new, military or other, challenges. It only calls for more intensive action on existing social problems and goes against the current trend of dismantling institutions that have provided social security for long.

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