

## Climate Change and Security Problems

Geographical and Functional Implications for Military Organizations

By Steen Nordstrøm

Report



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## Introduction

This report seeks to investigate the security implications of climate change from a Western, primarily Danish, military perspective. How can adaptation to climate change spur conflict and what implications does this have on military organizations? To answer these questions, the report parts from existing scenario-based analyses and take a mechanism-based approach. It describes the adaptation strategies that might lead to conflict and addresses in detail how climate change can act as channel, catalyst and trigger of conflict. In order to understand the future roles which military organizations are likely to face in response to climate change, it is useful to identify these mechanisms that link global warming to security problems. Furthermore, establishing the workings of mechanisms is useful because they can be monitored and thus give warning about future challenges that are slowly emerging.

New demands for Western military organizations as a result of climate-induced security problems are likely to materialize on two accounts. First, the consequences of global warming are testimony to the continued geographical expansion of security interests. Twenty years ago the frontline for European armed forces coincided with the Iron Curtain. A few years later Danish troops had been deployed to the Balkans and in the 21<sup>st</sup> century significant contributions have been made to the coalitions fighting wars in Iraq and Afghanistan. Rather quickly, the frontline for Danish and European security has been moved thousands of kilometers. The tensions that might follow in the wake of global warming will further accentuate the need for global presence of military forces. Secondly, the security problems potentially associated with climate change will result in new functional demands. In the 21<sup>st</sup> century military organizations must be able to field forces that have the capabilities to end conflicts, help alleviate humanitarian crises, and ensure the construction of viable state institutions. The cooperation between military and civilian actors entailed in the 'Comprehensive Approach', which is favored by Danish armed forces in today's conflicts, will likely become an even more useful tool in the future. It will, however, have to be adjusted slightly.

Many existing empirical analyses of the security implications of climate change or related phenomena rely on historical conflicts and knowledge of historical ecological conditions.<sup>1</sup> Such analyses might give us an idea about how changing climatic patterns can lead to conflict. But the question about how well historical events will be a good guide to the future remains. Can we generalize from the past to the future when it comes to social responses to climate change? Another common way to understand which security implications might be associated with climate change has been to use scenario building.<sup>2</sup> In scenarios, factors can be manipulated to depict relevant consequences and make the unimaginable accessible. Scenarios are highly useful to set the mind free and ensure that

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(1) Goldewijk 2005; Binningsbø, de Soysa et al. 2007; Haldén 2007; Mayer 2007

(2) Schwartz and Randall 2003

multiple pathways to future conflict and cooperation are explored. The drawback is often a lack of systematic treatment of data and a lack of identification of key elements in the processes.

To mitigate these shortcomings of existing approaches, this report seeks to understand the mechanisms through which climate change can obtain security implications. This approach is chosen for two reasons. First, mechanisms can be monitored and hence used to identify situations that could potentially result in conflict. Secondly, understanding which mechanisms need to be decoupled to prevent conflict will give hints about the demands military organizations are likely to face in the future. This report takes its point of departure in three specific mechanisms – catalyst, trigger, and channel – that the existing literature identify as potential ways of linking climate change with conflict and seek to show how they can result in different types of security problems.

## Is climate change a security issue?

Global climate change as a potential security issue has recently been scrutinized by the United States (US) intelligence community in collaboration with numerous experts from academia and elsewhere.<sup>3</sup> The resulting National Intelligence Assessment stresses the uncertainty related to the security implications of climate change. In the words of Director of National Intelligence, Dennis C. Blair:

*“We judge the most significant impact for the United States will be indirect and result from climate-driven effects on many other countries and their potential to seriously affect US national security interests. We assess climate change alone is unlikely to trigger state failure in any state out to 2030, but the impacts will worsen existing problems such as poverty, social tensions, environmental degradation, ineffectual leadership, and weak political institutions”.*<sup>4</sup>

In itself, climate change will hardly be the ultimate reason behind future conflicts, but other incompatibilities are likely to increase as a result of global warming. Even with a relatively narrow definition of national security, climate change is likely to have implications. Extreme weather events, sea-level rise, and changing rainfall patterns can affect the US homeland, its economic partners, and allies. Moreover, it can cause humanitarian disasters around the globe that would result in the call for assistance by armed forces. The US intelligence community does, in other words, foresee significant negative consequences of climate change but caution about believing that outright conflict will occur.

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(3) Director of National Intelligence 2008

(4) Director of National Intelligence 2009, p. 4

From a European perspective the outlook is similar. Global climate change need not lead to conflict. Many types of adaptation to the changing physical and social conditions are possible, and conflictual responses to climate change are the least likely ones. But absolute certainty can never be given in security politics. Military organizations need to be prepared for future demands to operate in new geographical settings or to fulfill new functions. Furthermore, it is not necessarily the firm scientific establishing of causal links between global warming and security issues that will shape the future demands for Western military organizations. Rather it is the perception and the political understanding of the connections between climate change and security that will determine what the future will bring. Keeping in mind that climate change is currently being securitized at an alarming rate by numerous actors, it is relevant to analyze the possible associations between climate change, conflict and the demands they are likely to result in.

## Perceptions matter

There is little evidence to suggest that climate change will have direct causal effects on international security issues, but a number of indirect effects have been discussed recently.<sup>5</sup> These include the security threats resulting from increased migration, wars over scarce resources and new territorial disputes.<sup>6</sup> The likelihood of such events is subject of discussion. Not only is current knowledge about climatic changes characterized by significant uncertainties, the social responses to unfolding events is adding an additional layer of uncertainty to the discussion.<sup>7</sup> Dire prophecies might become self-defeating because policy makers correctly identify future threats and counter them now. Contrarily, events that did not need to become security threats might end up being precisely that because they are talked about as such in the current debate. This is the argument behind securitization theory.<sup>8</sup>

Securitization of the environment, and more specifically climate change, is traditionally understood to imply that perceived environmental problems are elevated to a status where they can be potentially and legitimately solved through the use of force or threat thereof. However, as Buzan, Wæver, and de Wilde<sup>9</sup> point out:

*"It is not the actual disasters but their prediction that leads to securitization... The environmental sector displays more clearly than any other the propensity for dramatic securitizing moves but with comparatively little successful securitization effects (i.e. those that lead to extraordinary measures)."*

(5) See Salehyan (2008) or Buhaug, Gleditsch et al. (2008) for a thorough discussion of the absence of direct links. For a dissenting view, see Busby (2008) or the report by High Representative Solana and European Commission (2008).

(6) Center for Naval Analyses 2007; Smith 2007; Busby 2008

(7) Nordstrøm 2007

(8) Wæver 1995

(9) 1998, p.74

Obviously, the current debate about climate security in both scientific and political communities contains some of those dramatic securitization moves. Neologisms like 'climate wars' and 'climate refugees' are quickly finding their way into everyday language.<sup>10</sup> What measures will result from the securitization effort is too early to say. The point however, remains that the mere suggestion that climate change will have dramatic security effects, is likely to have political repercussions and hence shape the expectations of military organizations. Perceptions matter and the result is that militaries will be expected to consider the potential security implications of climate change, and determine ways to address these challenges.

## Strategies for adaptation

Security challenges can be prevented, managed, removed, or ignored. Traditionally security politics have been mostly concerned with removing threats by ensuring military capability to enforce decisions by force if necessary. In the post-cold war world this focus has shifted. Now there is a tendency in security politics to adhere to a logic that firstly promotes prevention of problems and secondly, in case they escalate, attempt to manage them rather than to remove them by force. Witness for instance how nuclear proliferation is being tackled, or the widespread acceptance of the Comprehensive Approach to strengthen nation building efforts and carry out counter-insurgency operations to prevent and manage global terrorism.

When it comes to the potential threat of climate change, prevention is unlikely in the short run. Even in its most optimistic scenarios the International Panel on Climate Change foresees further global warming throughout the 21<sup>st</sup> century.<sup>11</sup> The question is how the affected countries and populations will adapt. It is their strategies for adaptation that will shape the need for and scope of military intervention.

As noted, there is some disagreement about whether conflict or cooperation will result from climate change. Most analysts suggest that states and social groups are most likely to first seek cooperative solutions to the problems posed by climate change.<sup>12</sup> After all, technical or institutional solutions to distributional difficulties will typically be more efficient than conflict, which is prohibitively expensive, politically problematic, and likely to result in sub-optimal outcomes. Nevertheless, some suggest that various conflictual responses to climate change such as mass migration and resource wars will happen both at state and intra-state level.<sup>13</sup> The different strategies actors can take are summarized in figure 1.

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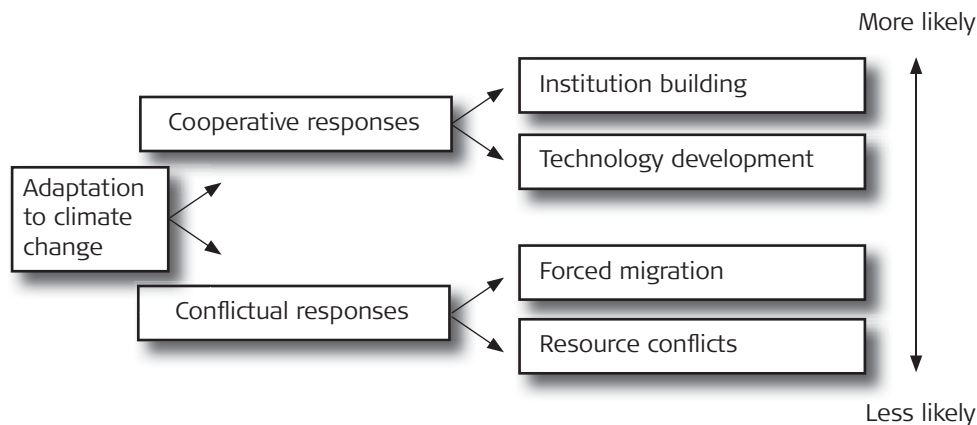
(10) E.g. Rasmussen 2007; Ejsing 2009

(11) IPCC 2008

(12) Stucki 2005; Salehyan 2007; Buhaug, Gleditsch et al. 2008

(13) High Representative and European Commission 2008

Figure 1. Strategies for adaptation to climate change



The figure is not meant as an exhaustive overview of possible strategies. Clearly there are several possible answers to the challenges posed by climate change depending on which situation and actors we look at. What adaptation strategy actors select in critical situations will depend on interaction between different stresses such as time pressure, financial concerns, perceived importance of a problem etc.<sup>14</sup> Fundamentally however, responses will be either cooperative or conflictual. The former are more likely, whereas the latter are the more interesting one from a military perspective. What roles military organization will have to take on in the future depend largely on how states and societies chose to adapt. Hence, in the following focus is on conflictual responses.<sup>15</sup>

Two of the most commonly cited conflictual responses to climate change are migration and conflict.

Migration can be conflictual if population groups are forced to leave their homeland or resources because of flooding or increased scarcity of arable land. This type of adaptation occurs already in drought-affected areas like the Horn of Africa or in hurricane-affected areas in Central America and the Caribbean. Climatic changes in general and extreme weather events in particular, have the potential to cause large-scale migration. Hurricane Mitch displaced some 3 million people in Central America. Most remained in their countries of origin but substantial numbers decided to emigrate, many to the US.<sup>16</sup> Prolonged droughts and desertification in Sudan and Kenya have likewise led to both internal and regional migration of large numbers of people.<sup>17</sup> Environmental refugees already exist and changing weather patterns is likely to act as a push factor to generate more. The lure

(14) A comprehensive analysis of when exactly various actors select specific adaptation strategies is beyond the scope of this report. It is, however, a key part of understanding the possible security implications of climate change.

(15) For an overview of cooperative responses, see Gleditsch and Thiesen (2006).

(16) Smith 2007, p. 624

(17) UNEP 2007; Cilliers 2009

of better financial opportunities in urban centers or in the West will be a powerful pull factor that increases the likelihood of population movement. The resulting displacement of people need not lead to conflict. However, if either migrants or people in the recipient area carry a strong group identity, trouble can be brewing.<sup>18</sup>

Resource conflicts are the most severe and most unlikely conflictual response to climate change. Intra-state conflict over resources is, however, relatively common even today and it is possible climate change could exacerbate this kind of problem in the future. Civil wars that revolve around renewable resources, frequently labeled neo-Malthusian conflicts,<sup>19</sup> display a striking continuity in their historical presence. Resources like arable land, water, and timber have shaped human development for thousands of years and continue to be of great importance to large societal groups in most countries. Neo-Malthusian conflict almost exclusively take place in developing states where large parts of the population depend on natural resources for basic livelihood. For instance, the central regions of the Philippines suffered from an insurgency in the 1980s and 1990s, which arguably had its roots in land degradation and increasing deprivation of landless agricultural workers.<sup>20</sup> Another illustrative example of the neo-Malthusian dynamic, where resource scarcity had negative and very elaborate consequences for social behavior, is pre-genocide Rwanda. Here a war pitched a rebel group based on landless refugees that wanted to return to Rwanda against government forces. The conflict did not end until the government forces were overrun by the rebels during the genocide in 1994. Ever since, conflict has lingered on in the Great Lakes region. The Rwandan conflict offers proof of how an intra-state conflict can morph into an international war with security implications for an entire region.

It should be noted that neither the conflict in the Philippines nor the one in Rwanda evolved solely due to resource problems. The conflicts were the result of deliberate actions taken by politicians and rebels. Bad governance and belligerent actors remain a precondition for resource conflicts.

Unlike intra-state conflict, international conflicts over scarce, renewable resources like water are rare. The 1989 skirmishes between Senegal and Mauritania are often used as empirical illustration of such events. Here approximately 400 people lost their lives due to hostilities over water rights and fertile land, and it took years for the countries to reestablish a normal relationship and diplomatic ties.<sup>21</sup> The example illustrates that scarce re-

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(18) Homer-Dixon and Blitt 1998

(19) Neo-Malthusian conflicts take their name from the British 18<sup>th</sup> century demographer Thomas Malthus, who suggested that human population would grow exponentially while food production could only be increased linearly. After a while population growth would outstrip food production with strife and conflict as a likely consequence. While Malthus focused exclusively on food scarcity in his path-breaking analysis, his intellectual heirs have expanded the scope of the conflict dynamic to include more than just strife to avoid food shortages. Contemporary conflicts are often given the neo-Malthusian label if they display linkages between natural resource scarcity and population pressure.

(20) Homer-Dixon 1999, p. 153; Kahl 2006

(21) Homer-Dixon 1999

sources or quick changes in environmental conditions can lead populations and politicians to choose conflictual strategies. Yet, these security problems are likely to emerge only if states and populations are vulnerable beforehand.

## A mechanism-based understanding of climate change and security

Having investigated select strategies for adaptation, focus can be turned to the specific mechanisms that might link climate change and conflict. Mechanisms in this context are defined as the processes that link a cause (climate change) with an effect (the specific response to a perceived security threat). Mechanisms are, in the words of George and Bennett: *“Ultimately unobservable physical, social, or psychological processes through which agents with causal capacities operate, but only in specific contexts or conditions, to transfer energy, information, or matter to other entities”*<sup>22</sup>

This implies that mechanisms operate at a different ontological level or have a different ontological status than the observable elements they connect.<sup>23</sup> Mechanisms do not act by themselves but instead shape the responses of actors, even if it is individuals, organizations, or nation-states, to real or perceived security problems.

By looking at mechanisms, this analysis takes a step away from the macro correlations between war and environmental change, which has become so commonplace to focus on in empirical analysis or scenario building exercises. The interesting aspect is not whether climate change mostly leads to conflict or cooperation but how these connections might come about. Trying to elaborate the workings of mechanisms rather than looking exclusively at single threats or establishing correlations helps to identify areas for policy intervention. This in turned can be translated into changed expectations to military organizations.

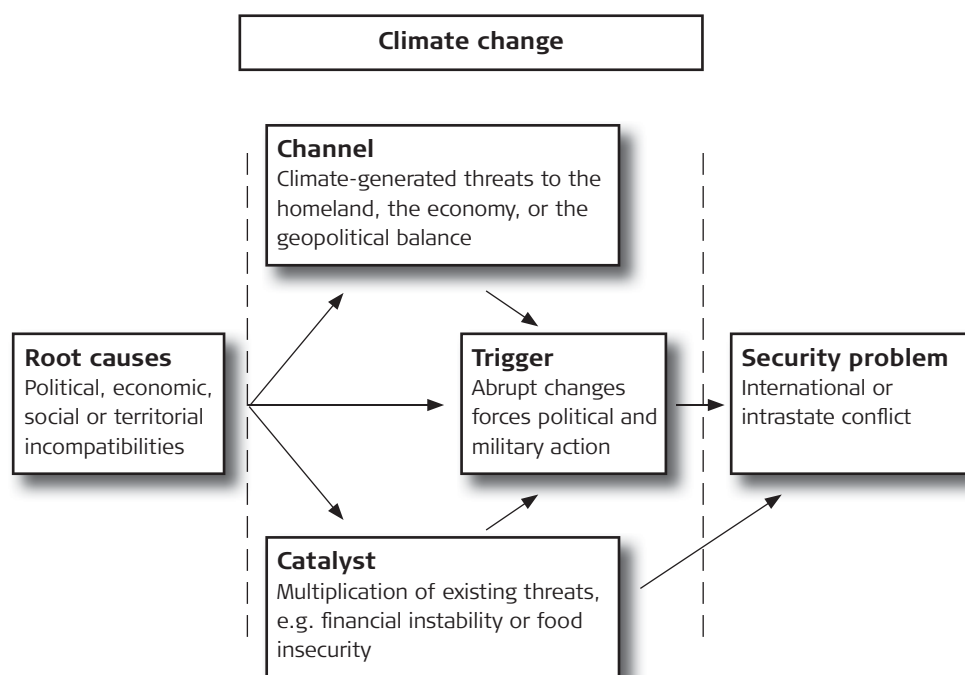
While the root causes of conflicts are likely to remain the same as we know today, climate change bears the potential to influence the way these causes materialize into security challenges, as illustrated in Figure 2.

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(22) 2005, p. 137

(23) Hedström and Swedberg 1998

Figure 2. Mechanisms that associate climate change with security problems<sup>24</sup>



The arrows in Figure 2 demonstrate the most common pathways from root causes to security problems. Climate change typically takes effect in the intermediate stage where it can act as catalyst, channel, or trigger. Triggers and catalysts are the only mechanisms with direct links to security problems because they either changes actors' preference from cooperation to conflict (triggers) or intensify an existing security problem (catalysts). Below each mechanisms is discussed in detail.

## Climate change as a catalyst or threat multiplier

In this context a catalyst can be defined as an event or condition that exacerbates an already negative situation. It is, in other words, something that amplifies negative factors and makes a security challenge more likely to happen, prolong it, or to increase its intensity. It follows from this definition that a catalyst is equal to the concept “threat multiplier”, which has gained some prominence in the climate security literature.<sup>25</sup>

(24) The figure is inspired by the investigation of causality in environmental conflicts carried out by Dessler (1994) and Baechler (1999). In addition to the three roles discussed here, Dessler suggests that the environment can also be a target in conflicts. That is, something that the warring parties tries to take control over. Clearly this observation is applicable to the physical environment (land, water etc.) rather than to a climatic phenomenon such as global warming.

(25) E.g. Center for Naval Analyses 2007

Climate change is probably most likely to induce security problems by acting as a catalyst. There can be little doubt that climate change has the potential to magnify problems around the globe. Even in its most moderate predictions, the IPCC (2008) finds that global temperatures will rise by 2-4 degrees centigrade by the end of the 21<sup>st</sup> century and that increasing temperatures will be accompanied by sea-level rise of 20-60 cm. and significant loss of biodiversity. Such dramatic changes in the natural systems of our planet will have social consequences. Agriculturally-based economies will suffer in the regions that will face droughts and desertification. This will be the case in much of sub-Saharan Africa and in parts of Asia. In places like Northern Europe and North America warmer climate will probably increase agricultural output. The combined effect on global food prices is uncertain, but chances are that some of the planet's most vulnerable populations will be negatively affected.

Economies are also likely to suffer from the costs of upgrading existing infrastructure to changed weather conditions. In some regions dikes and levees will need to be constructed and others will have to construct desalination plants to provide sufficient freshwater. While such costs might seem fairly trivial to Western societies, they can severely affect developing countries. In the Stern Review (2006) it is estimated that the total cost of climate change in the mid-21<sup>st</sup> century will be around 5 % of global GDP.

The social consequences are not limited to volatile food prices and economic problems. Migration patterns are also highly likely to be affected. There is much disagreement about how much migration climate change will result in. Estimates vary wildly with some suggesting a billion people could be affected within a century.<sup>26</sup> Other studies have led to more moderate but still significant numbers. The Stern Review (2006) reaches a total figure of 200 million over the course of a century.

Clearly, the economic challenges and displacement of populations can have negative effects. The question is, if this will escalate into conflict. Climate change is a gradual process and hence the migration is likely to happen slowly, which will leave both migrants and recipient societies time to adapt. This should minimize the risk of security problems. Moreover, unlike some existing refugee populations, climate-related migrants will have no common political agenda. They will have no dictator, they want to topple or an ethnic group to blame for their misfortunes. Again this detracts from the conflict potential in the situation. Nevertheless, the multiple stresses resulting from suffering economies, moving populations and food insecurity can well be perceived as a security problem catalyst in unstable societies.

Climate change alone is neither sufficient nor a necessary cause for security problems. But together with political animosity, social instability, and economic difficulties it might facilitate pressures that eventually result in conflict.

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(26) Christian Aid 2007

In order to disrupt the catalyst mechanism, the multiple stresses that could interact to cause security problems must be monitored. If negative interaction between various stresses is diagnosed in time, traditional foreign policy tools such as financial and humanitarian aid might easily and relative inexpensively prevent the problem from escalating to a level where military involvement is needed. Hence, increasing the monitoring of societies that are vulnerable to political, social, economical and climatic stresses is an important first step. Moreover, it should be acknowledged that addressing one problem – for instance improving economic conditions in a society – might not be sufficient to avoid a security crisis from evolving. The introduction of a potent catalyst like climate change can cause negative interaction between multiple social and economic ingredients, and cause a seemingly normal reaction to spin out of control.

## **Climate change as a channel**

A channel is a fault line in a conflict or an issue around which opponents rally supporters. Political leaders may prey on the hardship of populations adversely affected by climate change to challenge rivals or promulgate violent policies.

Frequently cited channels to security problems are ethnicity or social identity. However, physical elements can also be used as channels in conflicts. This is the case when leaders portray a specific territory as 'sacred' or of special importance to a state. Climate change acts as a channel when the threats (real or imagined) it poses are used by actors to mobilize groups and sharpen their collective identity in conflict with other groups.

Environmental concerns can be quite powerful when justification for violence is needed. Rebels in Nigeria's Niger delta have skillfully stressed environmental destruction by foreign oil companies as part of the grievances that have led them to take up arms. Similarly, locals at Bougainville Island in Papua New Guinea focused on pollution caused by an Australian copper mining company when they rebelled in the 1990s. Lately Somali pirates operating in the Gulf of Aden and Somali Basin have pointed to overexploitation of marine resources and dumping of toxic waste by foreign vessels as a justification for hijacking ships.

In a global climate change context, extreme weather events or sea-level rise that threatens the homeland of different states could become a channel. Several Pacific island nations can credibly argue that climate change poses an existential threat to them. The question is who belligerence would be directed towards in such cases? Clearly it would be impossible to pinpoint the blame as in the abovementioned cases of rebellion and piracy. It is possible, but until now unsubstantiated, that weak groups inside the states could be targeted as scapegoats. A more likely channel concerns territories that will become accessible as the earth heats up. Witness for instance the current diplomatic struggle for control with the Arctic region and the symbolic value attached by some countries to the North Pole. Here belligerence can be easily directed towards other claimants.

## Climate change as trigger of security problems

A trigger causes actors, who were previously opposed to conflictual responses, to prefer such action. Triggers are per definition sudden events, strictly limited in time and space. In a climate change context, extreme weather events like hurricanes and floods are potential triggers of security problems. Such dramatic event will typically demand quick reactions and in such cases cooperative responses might be considered too time-consuming or otherwise unattainable. It has been suggested that the events that followed in the wake of Hurricane Katrina, which hit New Orleans in 2005 killing more than 1.800 people and causing damages in the excess of \$ 80 billion, were indeed security problems triggered by a dramatic weather phenomenon. After the hurricane had destroyed the levees around the city, 270.000 people were forced to flee, state of emergency was declared, and Federal and National Guard troops were deployed to prevent looting and manage anarchy.<sup>27</sup> While Katrina herself might not be a result of climate change, although that is possible, the dynamics that followed her are taken as an example of how quickly members of an otherwise well-functioning society can opt for negative responses to changes. Buhaug, Gleditsch et al.<sup>28</sup> suggest that natural disasters might hitherto have been somewhat overlooked as security problems that can be triggered by climate change, and that more research should be conducted on security implications of such disasters. Homer-Dixon<sup>29</sup> has carried out numerous studies of environmental change and the responses scarcity brings up in affected populations. These studies indicated that sudden degradation of natural resources can lead to security problems but that distributional and/or political problems in the affected societies is a prerequisite for large-scale violence.

Triggers are almost per definition hard to predict or monitor. However, by acknowledging that climate change can sometimes cause rapid changes – and that this will most likely be extreme weather events that potentially causes damage to cities, infrastructure or agriculture – it becomes clearer what to look out for and what type of security problems might occur. These will not be well-planned conflicts but sudden bursts of violence and humanitarian misery.

## Geographical and functional policy perspectives

Breaking the links between root causes and security problems can prevent conflicts or minimize their negative consequences. Hence, it is imperative to monitor if climate change starts to act as catalyst, channel, or trigger in volatile situations. Military organizations need to be ready to monitor these developments and to act on them if required. Such requirements point to new geographical and functional demands. In figure 3 security problems are classified on two dimensions: The first is their strategic implications and the

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(27) Busby 2008

(28) 2008, p. 37

(29) 1991; 1994; 1999

second the scale of the problem. The resulting four types of problems illustrate the challenges that militaries are likely to face in light of global warming. I use these problems as a starting point for the discussion of future geographical and functional demands.

Figure 3. Classification of climate-induced security problems<sup>30</sup>

		Scale of Security Problem	
		Large	Small
Importance of Security Problem	High Strategic Importance	<u>Strategic problem</u> <ul style="list-style-type: none"> <li>• Geopolitical instability, e.g. due to territorial disputes</li> <li>• Major disruptions of energy infrastructure</li> </ul>	<u>Monitoring-demanding problem</u> <ul style="list-style-type: none"> <li>• Increased possibility for civil/military presence in sensitive areas</li> <li>• Immigration</li> </ul>
	Low Strategic Importance	<u>Moral problem</u> <ul style="list-style-type: none"> <li>• Sub-Saharan civil wars</li> <li>• Significant natural disasters</li> <li>• Disruption of law and order</li> </ul>	<u>Minor problem</u> <ul style="list-style-type: none"> <li>• Political instability in small states, food riots etc.</li> <li>• Low-level skirmishes over e.g. land or water rights</li> </ul>

The threat matrix contains selected examples of security problems that climate change can potentially induce. The examples given do not necessarily require climate change to act as catalyst, channel, or trigger to occur. Interplay between other negative factors could result in similar problems. Nevertheless, the examples are selected because they are indicative of the challenges militaries need to be ready to face.

### Geographical changes

The globalization of security challenges that has become a defining characteristic of the post-cold war world is likely to continue in the coming decades when the effects of climate change become clearer. As a result the political processes that have transformed national forces to expeditionary, and regional organizations to global ones, will continue. Climate change will be felt around the globe and Western militaries will likely find themselves solving both territorial and extraterritorial tasks.

The strategic problems outlined in figure 3 involve increasing balancing between great powers – US, Russia, China, India, and perhaps the European Union (EU) – and attempts by these actors to shore up control with the sea-lanes and transit areas of vital interest to them and their strategic partners. Climatic changes might lead to increased patrolling in Arctic waters by some of these states and by the states that need to enforce their sovereignty in the area.

However, the greatest need for military involvement is likely to be found in what is com-

(30) This classification draws on the dimensions developed by Busby (2008).

monly referred to as the Arc of Instability; the moon-shaped region running from the Sub-Saharan conflicts in DRC and the Horn of Africa up through the Middle Eastern conflicts and Afghanistan and down towards South-East Asia.<sup>31</sup> Countries in the Arc of Instability suffer disproportionately from security problems already and will face additional challenges when climate change further stresses the societies. There is widespread agreement that these countries will suffer significantly from climate-induced problems like desertification, sea-level rise and water shortages, while at the same time having the lowest coping capacities because of weaknesses in their economies and state institutions. Hence, the military focus currently afforded the region is likely to grow in the future.

Less than 25 % of African borders are demarcated. Therefore it is not only in the Arctic region that territorial disputes can occur. In fact, African territorial disputes might potentially be more explosive because border disputes can interact with ethnic cleavages, and the easy access to small weapons that facilitate insurgencies and proxy wars.

The security problems in the Arc of Instability differ from the geopolitical challenges because of the low level of strategic importance many of the affected countries have. This implies that problems will fall in the moral or minor problem categories. While this might diminish the likelihood of large-scale military intervention, it does not rule out humanitarian operations or short-run stabilization operations akin to the ones carried out by the EU in DRC or Chad. Demand for such operations is likely to increase in the future.

### **Functional changes**

Security problems cover a broad spectrum from diplomatic tension over local skirmishes to international wars. Arguably, there is a great variation in the likelihood of global climate change leading to these different problems. Opting for war will probably be the last resort for groups negatively affected by climate change and hence a rare outcome. Other less intensive but still conflictual responses to climate change might occur more frequently. The various security problems require different solutions and cooperation between multiple agencies. There is little doubt that dealing with wars and enforcing peace is the job of militaries. However, dealing with less intensive security problems is a much more muddled affair. In Western countries the job of mitigating, the adverse effects of climate change on vulnerable populations in other countries, will typically be considered a job for development agencies, foreign ministries and NGOs in tandem with the affected states. Yet, some of these actors might hesitate to get involved in situations where conflicts are escalating or some of them might lack technical or organizational capacities to ensure that humanitarian crisis do not evolve into full-fledged political and security crisis. The greatest functional challenge posed by climate change to Danish and comparable Western militaries is likely to be the creation of institutional routines that clarify the role of different state agencies and non-state actors, and ensure cooperation between them. Building on the experiences from the implementation of the Comprehensive Approach in conflict-ridden

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(31) National Intelligence Council 2008

settings is recommended. The coordination between military and civilian contributions will be necessary to effectively address the security challenges driven by climate change. The Comprehensive Approach will, however, require some adjustment to become applicable to climate-related problems. Rebuilding infrastructure damaged by climatic events and establishing institutions that ensure peaceful division of scarce resource will require civilian expertise. Hence, it is necessary to develop the Comprehensive Approach to encompass these aspects too. In fact, most of these potential security problems to stem from climate change will most efficiently be addressed from the civilian side, i.e. through development aid, promotion of good governance, and institution building. Yet military efforts may of course be needed to end hostilities and enforce peace agreements, but military capacities could also be drawn on for technical assistance and capacity building in the security sectors of the affected societies. Finally a military component could be expected to work on confidence building between different actors such as government forces and rebels; locals and migrants; and different ethnic groups.

In addition to the adjustment of the Comprehensive Approach, climate change can be expected to result in two functional demands.

First, as a consequence of the global reach of climate change and its impacts on the geopolitical balance and in the Arc of Instability, expeditionary forces and local partnerships will be required. Expeditionary forces have long been a mantra in North Atlantic Treaty Organization (NATO) but partnerships with countries outside the Western world are still in their infancy. In order to counter some of the moral and minor problems in the Arc of Instability, a strategy of establishing partnerships and building capacities in selected states in regions should be pursued. Given the low capacity and the abundance of security challenges in especially the Sub-Saharan region, this would be an obvious place to start. The capacities which need development in this context are primarily training for humanitarian missions including disaster relief. Strategically these aspects fit well with the overall goals of the Danish Africa strategy, which among other things entails support for the creation of an African Standby Force and establishment of capacity building programs.<sup>32</sup>

Secondly, creating early warning systems that monitor when climate-induced problems move towards becoming a security issue is often talked about, but rarely carried out. It should, however, be seriously considered to establish such a system either nationally or in a multilateral setting. Part of the reason why early warning systems rarely succeed is of course that security problems are complex social phenomena, which are notoriously hard to predict. Yet, the specific subset of problems that relate to climate change might lend itself to an early warning system because it involves the monitoring of natural systems such as extreme weather events, desertification, soil erosion and water scarcity, which are easier to identify than social changes. Systematic collection of data on such issues already exists. The challenge will be to combine this knowledge of natural effects

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(32) Udenrigsministeriet 2004; Udenrigsministeriet 2007

of climate change with intelligence on existing social behavior, security problems and instability. As an appendix to the need for an early warning system, there is also a need for greater understanding of the interaction between natural and social systems. While this might not be a functional challenge to militaries per se, but also to social science, it is crucial to improve the understanding of human response to the challenges induced to by climate change. It is frequently suggested that when pressured by external factors humans face the choice between fight or flight – between conflict and migration.<sup>33</sup> Yet, much more peaceful adaptation strategies are of course the primary choice – either by necessity, because many groups lack the means to fight for resources or to migrate, or by conscious decision to create new institutions or apply new technologies to the problems at hand. An understanding of what conditions might tilt situations towards the conflictual responses, like armed conflict or forced migration, would be a great improvement in light of the current securitization of climate change.

## Conclusion

What scenarios the future has in store when it comes to climate-related security problems is the matter of a great debate and many inquiries. In this report I have shed light on some of the key mechanism that can – but not necessarily will – lead climate change to obtain security implications. When the global climate changes societies and populations will become affected. States and people will try to adapt and fundamentally their responses to climate change will be either cooperative or conflictual. The former are the most likely, whereas the latter are the interesting one from a military perspective.

For practical purposes, this report has focused on three mechanisms that might link climate change to security problems: catalyst, channel, and trigger. The advantage of studying mechanisms is that it leads to knowledge at a higher level of generalization than would be acquired by studying single threats. As a result militaries can prepare for generic problems rather than specific conflicts. This is especially preferable when considering how to prepare new geographical and functional demands that might arise in the long run.

An additional advantage of focusing on mechanisms is that it gives a hint about what processes must be disrupted to prevent security problems from escalating. If for instance a trigger mechanism is correctly identified, specific interventions can be carried out to minimize the risk of large-scale violence.

Climate change and the mechanisms that might lead it to have security implications result in new demands to Western militaries. Both functional and geographical adaptation will be required. Geographically, future forces involved in climate change related intervention must be able to operate in all areas of the Arc of Instability. These countries are likely to

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(33) E.g. Buhaug, Gleditsch et al. 2008

be hit hardest by adverse effects of climate change and simultaneously have the weakest institutions for preventing conflictual responses. Moreover, many countries in this region already harbor security problems and social cleavages that increase the risk of turmoil. There might also be a need to increase enforcement of sovereignty in the Arctic.

Functionally, climate-induced security problems will require militaries to possess a large tool-box: Ideally they must be able to carry out operations ranging from disaster relief, humanitarian intervention, and rebuilding of state institutions to outright peace enforcement in resource conflicts. All of these roles are likely to require civil-military cooperation and hence the Comprehensive Approach should be developed to encompass these challenges. It is worth underlining that most of these functions are well-known to military organizations in the post Cold War era. Climate change is most likely to result in security problems that resemble existing challenges, albeit at a greater scale.

To improve the understanding of conflict mechanisms and the resulting demands to militaries, further research is needed. There is an obvious need for military organizations to analyze the adaptation strategies employed by actors that are negatively affected by climate change. Much of the existing literature on climate change and security challenges focus on negative responses, i.e. fight or flight. It is clear that these responses to climate change can lead to security problems, which could require international intervention, but it is equally important to understand the prevalence of these negative responses in comparison to other responses. Knowing what kind of deterrence or incentives might shift conflictual responses to cooperative ones would be very beneficial.

In addition, more attention should be paid to less dramatic security problems. Small-scale violence and tension will likely be the most frequent security problems to result from climate change, but they receive comparatively little attention in relation to climate wars and mass migration. To improve the understanding of what some of the smaller missions future militaries might face, more knowledge about the political and social processes that result in minor security problems is needed.

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