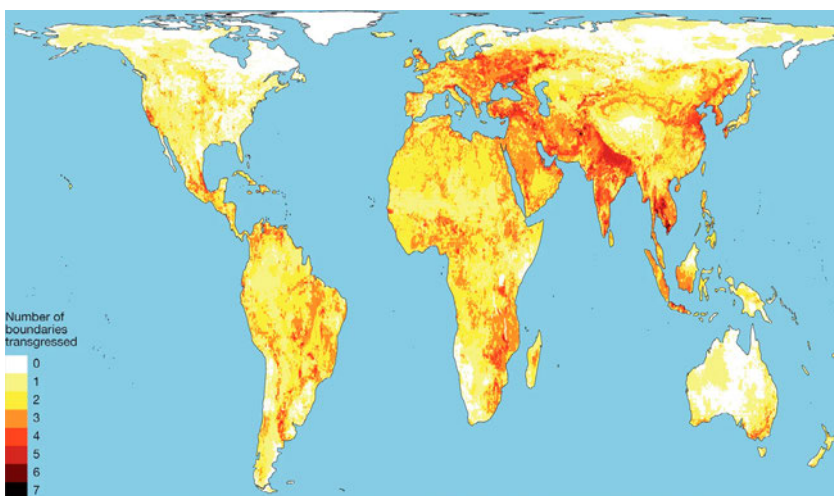


Introduction to Climate Security and the Military

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Climate change and the overuse of resources has a serious impact on human well-being across the world and leads to increasing security risks and conflicts (Scheffrena & Battaglini, 2011). While the impact of climate change is global, its effect on access to food, water, energy and infrastructure and the associated security risk varies strongly across regions of the world (Rockström, et al., 2023; Scheffrena & Battaglini, 2011). Many hotspots of climate change impact are in conflict areas, such as the Middle East, Afghanistan and Ukraine, as shown in Figure 0.1 (from Rockström, et al., 2023; Scheffrena & Battaglini, 2011). The scarcity of resources in these conflict areas often increases tensions and worsens conflicts and can be used by rival factions as leverage to local populations (Middendorp, 2023; Scheffrena &

Figure 0.1. Overview of the number of local transgressions of Earth System Boundaries from Rockström, et al., 2023 ©, indicating areas in the world that suffer most from system changes in climate, natural ecosystems, water systems, nutrient cycles and the atmosphere.



Battaglini, 2011). Moreover, climate change increases the risk of natural disasters (Ghazali, et al., 2018; Aalst, 2006). These natural disasters provide security challenges for the military and local populations (Aalst, 2006; Scheffrena & Battaglini, 2011). Therefore, climate and security directly influence each other, and thus the military needs to understand the climate-security nexus and how it can contribute to adaptation and mitigation through the design of climate security strategies.

This book, *Climate Security and the Military – Concepts, Strategies and Partnerships*, reviews the climate-security nexus from the military angle and proposes the design of climate security strategies and how they can contribute to adaptation and mitigation of the related challenges. Part 1 reviews the understanding of the climate-security nexus. Part 2 assesses the potential design of climate security strategies. In Part 3, adaptation to climate change by the military is reviewed. Finally, Part 4 discusses the potential contribution of the military to climate mitigation from the angle of operations on land, at sea, in the air, and through solar geoengineering. By thus analysing the impact climate has on security around the world and military operations, this book provides a unique and much needed view on the mutual influence of climate security and the military and provides suggestions to adapt to and mitigate the resulting challenges.

The first part analyses the climate-security nexus through the angle of extensive military experience, disaster studies, climate intelligence and small arms prices. In Chapter 1, Dutch Former Chief of Defence Staff (CDS) Tom Middendorp highlights the main interfaces between climate change, security and the military and outlines geopolitical and local impacts of climate change and the role of the military in adaptation through an interview. Chapter 2 provides a review of the main paradigmatic shifts in disaster studies over the last fifty years and lessons to be learned, and highlights some of climate security's own particular features. In Chapter 3, an overview of climate intelligence is discussed. The article highlights the potential scope and methodology for additional military taskings to support data collection for climate intelligence as well as the integration of climate intelligence capabilities across defence and beyond. Chapter 4 explores the relationship between major droughts and the likelihood of local conflicts through the correlation between small arms prices and climatic events and suggests local conflicts and arms prices increase after droughts, but only in fragile countries. Concluding, this part provides a broad review of the climate-security nexus through experience, intelligence, disaster studies and data analysis.

The second part discusses the design of climate security strategies and policies and its required partnerships in five chapters. Chapter 5 proposes a climate security intervention framework to support operational and strategic decision making. This framework, based on a broad range of studies, employs an implementation logic based on an integrated and multi-level stakeholder approach and is demonstrated

on a case study of Iraq. Subsequently, Chapter 6 analyses how Dutch strategies and policies address climate security. It then proposes to integrate climate security into development, diplomacy, and defence (3D) activities, as an integral part of the 3D approach and to consider climate security and conflict risk in international climate action. Chapter 7 investigates the influence of climate misinformation, by reviewing the implications of an alternative causal correction approach for minimising the effect of climate misinformation. The subsequent chapters focus on the partnership with industry by exploring Defence industry codes of conduct. Chapter 8 explores the codes of conduct of the largest Defence contractors and identifies opportunities in Defence procurement and supply-chain management. In Chapter 9, a conceptual model is proposed to identify the most important policy decisions on environmental sustainability performance, which should focus on both operational endurance and environmental sustainability, while maintaining information security. In summary, this part proposes addressing climate security strategy with all stakeholders and engagement with Defence industry to drive innovation for operational endurance and environmental sustainability.

The third part investigates how the Armed Forces can adapt to changing global climate security conditions. In this part, first the changing role of the military in crisis management and disaster response is reviewed in Chapter 10. Three changes in military posture are proposed in dealing with crises and disasters: the military needs to shift from a security to a humanitarian mindset, from autonomous to civil-military operations, and from crisis response to improving resilience. Chapter 11 proposes novel emergency response interventions for flood resilience, as part of the changing role of the military. It also reviews the role of the military in emergency response and presents the results of large-scale experiments under high-water conditions that demonstrate novel methods for flood prevention. These methods can be applied in the home nation or during operations far afield. Finally, in Chapter 12 a novel framework for the protection of vital but also vulnerable sustainable energy infrastructure at sea is proposed. The framework based on a quantitative operational analysis approach provides a structure for optimal surveillance patrols, to adapt to new vulnerabilities in energy security. In conclusion, the military needs to be prepared for collaboration in crisis management and disaster response, consider using novel methods for flood prevention and ensure protection of vital energy infrastructure, at home and during worldwide operations.

The final part covers the military's contribution to mitigation, from the angle of operations on land, at sea, and in the air, with a final review of the threat of solar geoengineering to climate security and state sovereignty. Chapter 13 reviews how adaptive military strategies and operations can be combined with more sustainable solutions. The chapter proposes to address the technical, logistic, and operational aspects of integrating renewable energy technologies into the Dutch

army by shifting towards collaboration, open innovation and ecosystem thinking. In Chapter 14, the energy transition of the Royal Netherlands Navy is addressed. It provides a critical review of the challenges and opportunities of the transition to alternative energy carriers and energy systems and proposes a direction for the required research and development towards the future navy fleet that can operate independently of fossil fuels and with minimal emissions and signatures. Chapter 15 proposes to improve mission effectiveness by applying helicopter formation flight. The work demonstrates both the operational improvement and establishes a potential fuel saving of about 10% with a new mathematical model. Finally, Chapter 16 reviews how solar geo-engineering, a potential mitigation technique for global warming, can be a threat to climate security, cooperation, and state sovereignty. In summary, this chapter investigates the impact of the energy transition for the army, the navy and the air force and provides an analysis on solar geoengineering as a potential new geopolitical threat, thus promoting that the military can contribute to mitigation of climate change and the environmental impact of military operations.

Acknowledgements

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