



Sustainable Peace & Security in a Changing Climate

Recommendations for NATO 2030

A report for the NATO Secretary General from the

**North-Atlantic Civil-Society Working-Group on
Environment and Security**



BRUSSELS
DIALOGUE
ON
CLIMATE
DIPLOMACY

Sustainable Peace & Security in a Changing Climate: Recommendations for NATO 2030

**A report for the NATO Secretary General from the North-Atlantic Civil-Society
Working-Group on Environment and Security (NCWES)**

An initiative of the Brussels Dialogue on Climate Diplomacy (BD CD)
Coordinated by the Environment & Development Resource Centre (EDRC)



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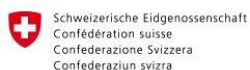
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PART 1: Introduction

1.1

Foreword

By Jamie Shea

It has taken some time for the security implications of global climate change to find their way on to the NATO agenda. This can be explained by the many security challenges that the Alliance has had to deal with in the 21st century - from a more assertive Russia in NATO's eastern neighbourhood to Afghanistan or the threat of cyber-attacks and hybrid warfare campaigns. At the same time, for a security community used to dealing with concrete and imminent challenges, climate change may well have seemed difficult to assess precisely or was something that would impact sometime in the future. In the international arena the focus was on mitigation - trying to significantly reduce greenhouse gas emissions - rather than on adaptation - making our societies more resilient to cope with the shocks that climate change driven events would inevitably produce. Once the shape of climate change as a security challenge became clear, in terms of particular locations and risk factors, policy makers would have time to adjust their thinking and strategies.

The past few years have underscored that the future is now, and there is no more luxury of time for us to try to better understand and respond to this challenge. The planet has given us a final wakeup call.

Yet the past few years have underscored that the future is now, and there is no more luxury of time for us to try to better understand and respond to this challenge. The planet has given us a final wakeup call in the shape of ever hotter summers, more named category hurricanes in a single year than we have ever known before, raging bush fires and large-scale flooding. Rising sea levels have placed entire cities and even countries in jeopardy. The biodiversity which has regulated the smooth functioning of our natural habitat for thousands of years is being rapidly depleted. Droughts affect freshwater availability and put acute stresses on food production and livelihoods. Climate change is arguably the first truly global security challenge in that it influences weather patterns in multiple locations and on every continent, exacerbating existing political, economic, and social stresses. It is thus a challenge of responding to multiple individual flash points (such as extreme weather events) while understanding the ways in which climate change is progressively reshaping our planet and laying the seeds of future conflicts over scarcer resources and the sustainability of life and particular models of economic growth and development in the longer run. Only in this way can we devise the preventative strategies to reduce the prospects that the worst-case scenarios will actually occur.

The military forces of many NATO countries have had to respond increasingly to disasters caused by extreme weather events in recent years. They have become actors as well as analysts, having to help with emergency relief efforts, deliver supplies, evacuate the stricken, build shelters, provide medical assistance, restore power lines and infrastructure, and help the civilian emergency response agencies

to cope with fires, flooding, earthquakes, and extreme storms. The capabilities that the armed forces provide, their high degree of organisation and their mobility and responsiveness make them natural partners for civilian crisis management, even if their primary role must remain the defence of our countries against armed attack.

In this process the armed forces have not only acquired valuable experience, but also identified the weaknesses that must be addressed. They have understood the need to adapt their own defence assets to be able to operate effectively in times of a changing climate, and to make their own equipment and operating procedures correspond more closely to the target of zero carbon emissions by mid-century. For instance, the Pentagon has assessed that up to two thirds of US military bases, particularly along coastlines, are vulnerable to climate driven events. Military equipment has to be resilient to function in hotter, or colder environments, and the dependency of armed forces on enormous quantities of fossil fuels, expensive to transport and store, needs to be drastically scaled back in line with the greening of the global economy. In short, our armed forces need to adapt to climate change in both their external strategies and threat assessments and their internal structures and organisation. Climate change has thus to be factored into every dimension of military planning; from modelling the operational environment, to training and exercises and to mission planning, capabilities, and equipment. In recognition of this new imperative the Biden administration in the US ordered a National Intelligence Assessment of the security implications of climate change in its first days in office.

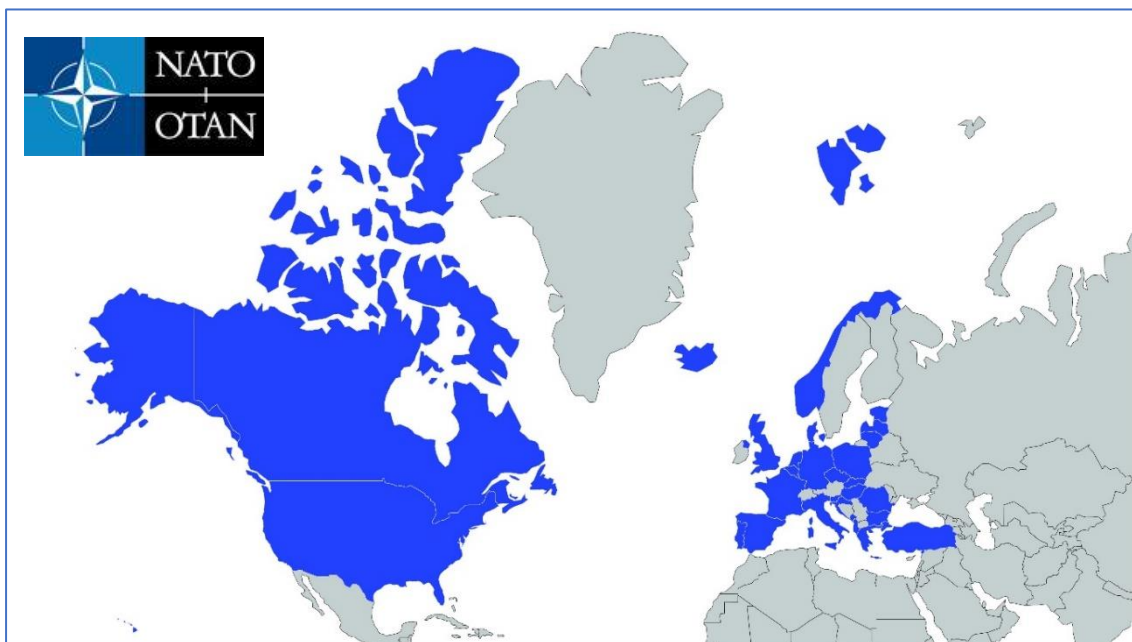
The great added value that NATO brings to bear has always been its ability to collectively assess a challenge, then devise the policy instruments needed for a comprehensive strategy; and finally to build the capabilities and skill sets to respond effectively.

NATO's purpose has never been to deal only with one threat in one place and at one given moment in time, but to protect its populations against emerging challenges to their security as they arise. So the Alliance has had to constantly adapt throughout its history to maintain its relevance. The great added value that NATO brings to bear has always been its ability to collectively assess a challenge, then devise the policy instruments needed for a comprehensive strategy; and finally to build the capabilities and skill sets to respond effectively. Sometimes in this effort NATO is in a leading role and sometimes in support of other actors and organisations. When it comes to the security challenges associated with climate change the Alliance will not be in the lead. Yet success depends on everyone playing their full part. Moreover climate change will impact significantly on the security of Allies and on the future tasks of their armed forces. So it is not a moment too soon for NATO to undertake a comprehensive review of what it can contribute further, and what it needs to do to adapt better. Many NATO assets can play an important role: its political consultation machinery, its extension network of partnerships and structured relationships with other international organisations, its intelligence fusion and strategic foresight expertise, its military and civilian planning mechanisms, and its education, exercising and training tools. The question is how to optimise them, and how to create the right networks to receive and transmit expertise. As a starting point NATO can set more stringent low carbon standards for its own member state forces and serve as a hub for the sharing of best practices and the expertise.



The NATO Secretary General, Jens Stoltenberg, has put climate change on the Alliance's agenda in recent speeches and public engagements. The North Atlantic Council has begun to look at the issue in a more systematic way. The NATO 2030 project has gathered inputs and ideas from the broader public. Predictably the Alliance's next Strategic Concept will define NATO's role in more substantive terms. As this process develops, NATO has also invited inputs and analyses from the community of climate change and security specialists from the world of government service and diplomacy, think tanks and academia.

The Brussels Dialogue on Climate Diplomacy – coordinated by the Environment & Development Resource Centre - is one such group with an extensive network of experts and practitioners across the globe. Responding to NATO's appeal, the Dialogue has put together a North Atlantic Civil Society Working Group on Environment and Security to bring together the most up to date thinking on many of the diverse aspects of the security implications of a changing climate and other environmental challenges. Several ideas and recommendations address the consequences for policy makers. The report that follows is not designed to be an exhaustive scientific or strategic study but rather a succinct overview sub-divided into a series of topic headings. It is the hope of all the members of the Working Group that these succinct overviews will help to stimulate, inform, and focus the debate among Allies as they take this issue forward. With its extensive expert network the Working Group stands ready to contribute further inputs and to consult with the Allies and the NATO staffs and structures whenever they would find this of value.



1.1: At present, NATO has 30 members. In 1949, there were 12 founding members of the Alliance: Belgium, Canada, Denmark, France, Iceland, Italy, Luxembourg, the Netherlands, Norway, Portugal, the United Kingdom, and the United States. The other member countries are Greece and Turkey (1952), Germany (1955), Spain (1982), the Czech Republic, Hungary, and Poland (1999), Bulgaria, Estonia, Latvia, Lithuania, Romania, Slovakia and Slovenia (2004), Albania and Croatia (2009), Montenegro (2017) and North Macedonia (2020).

1.2

Project Background and Process

By Ronald A. Kingham and Alexander Verbeek

About the NATO 2030 Initiative

In December 2019, the NATO Allied nations' leaders invited NATO Secretary-General, Jens Stoltenberg, to lead a forward-looking reflection to strengthen NATO's political dimension. The Secretary-General will put forward recommendations to NATO Leaders when they meet at the next NATO Summit on 14 June 2021. To inform the Secretary General's recommendations with a wide variety of views and fresh thinking, NATO is engaging actively with Allied nations, experts, public and private stakeholders, and young leaders.

The **NATO 2030** initiative was launched by the Secretary-General on 8 June 2020. Since then, NATO has been organising a series of thematic events to engage more in-depth with civil society, advocacy, and expert groups. These focus on the topics of climate and security, human security, economic security, and democracy.¹

On 22 July 2020, NATO organised the "NATO 2030 Online Dialogue: NATO's Interaction with Civil Society and Expert Communities". During this in-depth exchange of views, a select group of 10 trusted stakeholder organisations focused on their experience in working with NATO. They discussed suggestions to improve further NATO's responsiveness and openness to outside views and expertise.

The next step was to convene a meeting with civil society experts specifically on climate change and security. This event was organised with the Brussels Dialogue on Climate Diplomacy (BDCD), which brings together advocacy and civil society groups and, on an informal basis, representatives of international and regional organisations. This 12th meeting of the BDCD – entitled Climate Security Challenges for NATO – was co-organized on 17 September 2020 by the Environment & Development Resource Centre (EDRC) and NATO's Policy Planning Unit, Office of the Secretary-General.²

This session aimed to hear from participants how they see NATO's role in the mitigation of climate change and adaptation to climate security challenges. Fifty participants took part in the event, including experts from civil society organisations and observers from international and regional organisations.

About the NCWES Project



In response to the opportunity for civil society organisations to contribute input in the NATO 2030 process, EDRC invited the non-governmental organisations participating in the BDCD and other NGOs, think tanks and individual experts to form the informal **North-Atlantic Civil-Society Working-Group on Environment and Security (NCWES)** to exchange ideas and produce this report. The group consists of over 50 representatives of 25 organisations plus 20 others serving in

¹ NATO. "NATO 2030 Events". NATO. <https://www.nato.int/nato2030/events/>

² EDRC. "Climate Security Challenges for NATO: 13th Meeting of the Brussels Dialogue on Climate Diplomacy". BDCD. 17 September 2020. <https://www.brusselsdialogue.net/bdcd-meetings/climate-security-challenges-for-nato>

their personal capacities who are all experts on a wide range of climate, development, environment, and security issues. Just over 40% of the participants are women.

At its first meeting on 18 December 2020, the group agreed to focus its work on the security threats posed by a changing climate while also making sure to address other broader challenges to environmental security and human security in our report.

At our second meeting on 18 January 2021, the members were invited to propose topics and work together in preparing articles for the report – a first draft of which with our initial recommendations was shared with the NATO Secretariat on 5 February 2021. Since then, the draft was developed further with additional chapters resulting in the final consolidated version. In all, 30 authors and contributors produced 19 chapters containing a total of 116 recommendations.

Given the history of EDRC in promoting the integration of development, environment, and security policies and our experience in bringing together interdisciplinary experts for that purpose in networks such as the BDCD and the Global Military Advisory Council on Climate Change (GMACCC), the NCWES project opened an especially valuable window for combining the wealth of knowledge of this diverse group of experts for use in this important public consultative process.

We especially hope that our report will be useful as NATO works to create its action plan in follow up to the NATO policy document on climate change and security recently adopted by NATO foreign ministers.³

This report is not a blueprint of what should be done; it is a collection of policy options and practical recommendations to be considered in the NATO 2030 process that we believe can help strengthen the organisation in a time of new environmental-related challenges.

The NCWES members look forward to continuing to share their expertise and supporting NATO in this process.

Follow-up

This policy research project has been a truly collective effort and it is in that spirit that we plan to follow-up the release of the report with a series of events and related activities including a new research and action guide in the form of an interactive relational database on climate change and international security and further development of our project on Transatlantic Responses to 21st Century Environmental Challenges initiated by EDRC and its partners in 2019.

We will also be launching an online public platform to help stimulate broader interest in the work and to provide opportunities for the members and others to share new articles and insights for the benefit of NATO and other international, regional, and national organisations and agencies in the interest of promoting sustainable peace and security for all.

³ See: “NATO Secretary General Jens Stoltenberg and US Secretary of State Antony Blinken at the start of the NATO Foreign Ministers' meetings”. *NATO*. 23 March 2021.
https://www.nato.int/cps/en/natohq/opinions_182571.htm?selectedLocale=en

1.3

Realigning NATO's Role and Responsibilities

By Olivia Lazard



1.3: 178th Military Committee in Chiefs of Defense Session at NATO HQ, 16 January 2018.

From a vessel for cooperation and reconstruction to one of deterring growing global threats in nature throughout the last decades, NATO has proven time and again that it can successfully adapt. Deterrence was its central approach towards conflict prevention and de-escalation. This approach matched the risk environment: military competition which political reason often failed to fully rein in; and hybrid, asymmetrical threats that required more agility in kinetics and operational capabilities.

Deterrence remains invaluable, especially at a time when the global balance of power is shifting into fragmented multi-polarity. But it is no longer sufficient. The risk environment which NATO must grapple with today is fundamentally more global and diffuse. Importantly, it is not associated with an enemy. It is a risk environment of our own collective making, which demands collective responses. Climate change and ecological disintegration have been a gradual phenomenon which is starting to peak into deadly phases, and if left unaddressed, will simply undermine human civilisations. During the last strategic process that NATO went through a decade ago, climate change was not considered the most urgent priority. The collective focus of the Alliance remained on terrorism and the rise of hybrid threats. Across the board in international fora, inattention to the fundamental security issues that climate change posed was the norm.

How the world has changed in a decade.

How costly our inattention has been.

Not just in monetary terms. Not just in terms of human lives today. But in terms of time. Every year of inaction on the climate crisis takes time away from the future. Time away from peace. Time away from stable living conditions for humans and other species.

NATO's 2030 strategic process coincides with scientific warnings stemming from the IPCC, the IPBES and more largely earth scientists who say that we have a mere 9 years to avoid runaway climate change scenarios, in which disruption, competition for survival and protraction of disasters will become the norm.

NATO's 2030 strategic process coincides with scientific warnings stemming from the IPCC, the IPBES and more largely earth scientists who say that we have a mere 9 years to avoid runaway climate change scenarios, in which disruption, competition for survival and protraction of disasters will become the norm. With this dire warning in mind, what are NATO's role and responsibilities today and how might they be best realigned?

With this dire warning in mind, what are NATO's role and responsibilities today and how might they be best realigned?

The following compilation of articles demonstrates the breadth of changes that NATO could and should consider going forward. This publication aims to make one central thing clear: NATO must change from within in order to become apt and capable in external environments. It is not just a matter of improving capabilities. The changes ahead require first a change in mindset and approaches, leading to modifications in competency recruitment and streamlining, cooperation networks and objectives. NATO will only deliver on its core task to maintain peace and stability if it is able to reconsider what security is in a climate disrupted world and re-equips accordingly. If not, NATO will simply drive itself into obsolescence.

Agility

In a climate-disrupted world, expect the unexpected. Risk horizons, root drivers, manifestations of insecurity will both unfold in long- and short-term trends. Human, political, economic, geopolitical, technological, and ecological factors will shape instability and insecurity. Disasters will exacerbate fragility - not just in far-away places, but at home too.

In preparedness for it, NATO must develop institutional agility, defined both by the *ability* to anticipate and respond to multiple threats and risks on short- and long-term horizons; and by the *ability* to welcome new analysis and competencies to build resilience and restore stability over time.

Foresight, Analytics and Intelligence

Foresight capability is the critical starting point to explore adaptability and strategy design on various time horizons. NATO must strengthen this capability within the policy Planning unit and the Allied Command Transformation. Various authors in this publication argue for running annual foresight, simulation, and scenario-design exercises, better connecting and deepening the multiple strands of analysis related to climate change and ecological collapse, along with their interconnections with other types of threats.

Alongside this, NATO must also invest into an analytical and early warning system that is agile and holistic enough to factor in interdisciplinary data sets from satellite imagery, big data, conflict analysis and others. Security, going forward, must be reconceptualized multi-dimensionally.

In addition, environmental intelligence must be included in NATO's capability going forward. On this, our authors recommend dedicating an office within the Joint Intelligence and Security Division (JISD) at NATO Headquarters to environmental intelligence; and deepening strategic partnerships with relevant organisations such as the European Union (EU), the European Defence Agency (EDA), Interpol, Europol, and UNODC.

Multi-competency strategy and planning

Climate and environment-related risk analysis and response must be elevated at strategic levels. For this reason, our authors recommend appointing a special advisor to NATO's Secretary General dedicated to strategic oversight of foresight, analysis and planning related to climate and environmental issues. This position would work best in synergy within a team of special advisors dedicated to other strategic threats such as technology. In addition, environmental advisors must be strategically positioned in every NATO mission. The special advisor's role should include the organisation of trimestral meetings with earth scientists, ecological designers, disaster experts and the foresight unit; and monthly roundtables on specific issues that require NATO's specialised attention with other organisations.

Climate and environment-related risk analysis and response must be elevated at strategic levels. For this reason, our authors recommend appointing a special advisor to NATO's Secretary General dedicated to strategic oversight of foresight, analysis and planning related to climate and environmental issues. This position would work best in synergy within a team of special advisors dedicated to other strategic threats such as technology. In addition, environmental advisors must be strategically positioned in every NATO mission.

NATO must also invest in greater education and training spaces specifically related to climate and environmental issues. These issues must be integrated both as a mainstream educational requirement for NATO staff, and in some circumstances, specialized courses. For this reason, our authors recommend establishing a NATO Centre of Excellence on Climate and Security.

React and Respond

NATO will have to face short- and long-term disruptions for which it must equally prepare. Investing into foresight and analytical capabilities means that NATO should be better able to anticipate risks so as to pre-emptively respond. This will be particularly relevant in terms of disaster management, which will turn into a key feature of NATO's role going forward. To strengthen its role, NATO must strengthen and increase its capability preparedness to respond in due time and process to disasters where and when they occur (including within the Alliance and with partner countries). At the same time, NATO must simultaneously support Allies in repurposing and re-organising parts of national capabilities for pre-emptive disaster mitigation and prevention. On this, our authors recommend acquiring new competencies for natural and ecological engineering so as to re-create water-retention landscapes as a lead or in support of other actors. It should also ensure that its acquisition and procurement chains do not contribute to further ecological disintegration. For this, capability planning and operational planification is essential. These elements constitute a central aspect of addressing root causes of ecological insecurity and disaster fragility, while ensuring energy security responsibly.

Deter and Cooperate

Environmental and climate-related risks are compounding at a time when geopolitical competition is accelerating, with the risk for NATO members to face multiple organised and unorganised threats at once, coming from China, Russia, and hybrid actors. Interestingly, these seemingly distant threats are not taking shape independently from one another. Decarbonisation pathways and transition models are going to be a central locus of geopolitical competition over the next decade.

Where economic conundrums appear in this competition, security threats may well arise in the form of influence disinformation operations on the one hand, cyber security, and geo-engineering on the other. NATO must therefore maintain its ability to deter regular and irregular actors and seek to create and adhere to the highest ethical standards. But at the same time, the uncertainty of the risk environment in the next decade calls for strengthening strong networks of cooperation with other countries, other institutions and with civil society.

Two things will be essential to strike an adequate balance between the deterrence and cooperation approaches: 1) an adherence to key values including democratic freedoms and human rights; 2) creative and strategic investments into deconfliction, including within the alliance. On the latter, our authors recommend using the Mediterranean Basin as a pilot case to test environmental approaches to deconfliction as lead, or in support of other actors such as the Organisation for Security and Cooperation in Europe.

Resilience

Resilience in a climate disrupted world will be defined by the capacity to absorb the effects of multiple and varied shocks without faltering on fundamental values and fundamental stability. In order to build resilience over time, the capabilities previously outlined are critical. They must be coupled with a multi-dimensional pursuit for resilience, with aim to address fundamental drivers of insecurity, not just manifestations of it.

Operational resilience

NATO will face infrastructure challenges in the face of climate disruptions. It must therefore undertake a comprehensive assessment of how its infrastructures and capabilities will be impacted by changes in environments (rising seas, melting ice, drought, and others), and dedicate a specific taskforce to oversee the adaptation of its capabilities. It must naturally keep on investing in R&D so as to seek technical and technological improvements that enable its various roles in the future. NATO must ensure as well that investments in operational improvement do not come at the expense of other types of resilience in any given contexts (especially ecological resilience). NATO should improve its doctrines and standardization agreements to ensure that NATO's forces have the appropriate tools to consider human and environmental aspects in its missions, with the aim to improve operational effectiveness. To this end and in order to obtain an overview of already existing capabilities, NATO's Defence Planning Capability Survey (DPCS) could be used.

Ecological resilience

The notion of resilience is often thought of quite largely, except that security actors always fail to account for ecological resilience. This is a fundamental mistake. Climate change is one of many ecological crises facing us. The responses must start with ecology and expand from there. Our authors therefore recommend that NATO becomes an active partner in ecological remediation and regeneration in theatres of operation (as part of reconstruction), in partner countries (especially those that experience environmental damage from conflict and that experience ecological fragility) and within the Alliance itself (for example within the Mediterranean basin). NATO is a unique actor to do so thanks to its operational and strategic capacities. In addition, it must contribute to the fight against

organised crime related to environmental plundering through educational mainstreaming, partnerships, strategic and operational planning, and foresight analysis.

Human resilience

In a climate-disrupted world, human vulnerability is often the driver of large-scale shocks and an environmental driver. NATO should ensure that it 1) integrates human vulnerability in its analytical systems to understand the breadth of climate- and environment-related risks; and 2) cooperates extensively with the actors that work towards human resilience: from the European Union to the humanitarian actors in charge of relief operations in conflict and disaster theatres.

In a climate-disrupted world, human vulnerability is often the driver of large-scale shocks and an environmental driver. While it is not in NATO's direct mandate to work on human security, it must ensure that it ... integrates human vulnerability in its analytical systems to understand the breadth of climate- and environment-related risks.

Institutional and political resilience

NATO will be strong in context of partnerships and alliances in the future. And NATO members will only be as strong as the weakest of countries in the international community in light of risk percolation and systemic interdependencies. For this reason, our authors recommend that NATO truly embraces its roles as a vessel to build the capacity of partner countries on climate-risk analysis, preparedness, and resilience building. NATO has already started through its Science for Peace and Security Programme, but it must go beyond this initial step.

Accountability

Finally, while agility preconditions NATO's ability to nurture resilience within and for the Alliance, accountability will keep NATO vibrant. NATO should continue to adhere to fundamental values wedded to democratic freedoms and human rights, as well as to the required pace of action to address the climate emergency. Let us not forget that at the core of our climate and ecological crises lies a fundamental need to re-design the human footprint on the planet. NATO must play its part imperatively in this endeavour.

It is not just a matter of decreasing its own emissions, but of transforming itself into an active agent of geopolitical and ecological stabilisation. It must remain accountable to its member states and therefore commit to an annual independent review of progress against objectives in its own climate ambitions. It must also ensure accountability to civilians and governments in conflict theatres as well as within Member State constituencies by adhering to the highest of environmental standards and remediation demands. NATO naturally already developed to various Military Principles and Policies for Environmental Protection and other Environmental Protection Standardization Agreements (STANAGs). To go further, our experts recommend that NATO adheres to ICRC's updated *Guidelines on the Protection of the Natural Environment in Armed Conflict* and continue partnerships with the OSCE and the United Nations to refine protection and mitigation measures for the environment and dependent populations over time.

And where and when possible, it must also keep its member states and its partner countries accountable to the necessary demands of the climate transition.

At the end of the day, ensuring mutual and monitored accountability is about ensuring our collective survival in the future, and NATO's continued institutional relevance in yet another unstable era.

1.4

Climate Change and Environmental Collapse: Understanding the Challenges

By Olivia Lazard with Ronald A. Kingham

The climate crisis is one of many ecological crises, feeding off each other interdependently and causing disruptions to human security & geopolitical stability.

The ozone, pollution and biodiversity crises all produce specific threats by themselves. Together, they intertwine with the climate crisis and threaten ecological disintegration. That is, the inability of nature to support human civilisation. In particular, the collapse of biodiversity and the climate crisis are intimately related. The decline of biodiversity in terrestrial and marine ecosystems weakens their ability to regulate the global climate regime, thereby accelerating climate change. In turn, global warming gradually pushes these same ecosystems towards unsustainable thresholds. Human activity unequivocally drives these crises. These, in turn, produce disruptive feedback effects into human societies that increase the risks for pandemics, breadbasket failures, water scarcity, local or regionalized conflicts centred on natural resources or protectionist measures - to name only a few.

There is still time to address the driving forces behind these crises.

From switching energy systems to protecting the ecosystemic regulators of the climate regime as well as regenerating water-retention landscapes to mitigate slow- and fast-onset disasters, there are solutions available to all relevant actors. NATO stands at the crossroads between several of them. Its political and military composition makes it a unique actor to prevent, address, manage and mitigate climate-disruption drivers, impacts and geopolitical implications.

Past greenhouse gas emissions and trophic cascades have locked humanity into increasingly disruptive events that produce exponential orders of risks and impacts in our interdependent world.

But our global geopolitical and operational environment is irremediably changing, nonetheless.

Past greenhouse gas emissions and trophic cascades have locked humanity into increasingly disruptive events that produce exponential orders of risks and impacts in our interdependent world. Droughts in multiple places for example produce food insecurity in the most fragile contexts, often leading to socio-political tensions, geopolitical destabilisation and rise in hard security threats such as terrorism and violent extremism. Changes in natural patterns (e.g. seasons, rainfall precipitation, etc.) drive communities from their livelihoods and into migration. In some areas natural resource scarcity or changing patterns lead to conflicts. They may stay localised, but more often than not, conflict systems are becoming more regionalised, as well as more geopoliticised due to human movement, transnational crime, hybrid threats and a new type of resource competition at the global level (including for materials necessary for a “green” transition). In short, the geopolitical ecosystem is

responding to the changes in the planetary ecosystem. That means that our global security environment is shifting, and that NATO needs to evolve accordingly.

Systemic change is accompanied by specific threats: changing geographies, changing sovereignties, protraction of natural disruptions and socio-political fragility.

Climate change produces specific slow- or rapid-onset disruptions. All NATO members, partner countries and others will be increasingly affected by natural disruptions that will accelerate in pace, intensity, and numbers, either directly in their own country or indirectly by the geo-political, economic and security impact of these disruptions in other countries. Some may have more financial capacity to recover quickly, but the economic and human consequences of such disasters will run deep.

In addition, certain theatres will concentrate more tensions. The first on the list is the Arctic, naturally, which some NATO members have a direct stake in. The Arctic is warming twice as fast as the rest of the world. The ice loss is happening faster than expected. China, Russia, and others are heavily investing in infrastructures that will have two direct consequences: 1) accelerate ecological disintegration in the Arctic, with dire planetary consequences; and 2) upend geo-economic balances globally.



1.4: Rusted derelict ships on desert Aral Sea.

Other theatres include the Mediterranean, which is particularly hit by warming and loss of biodiversity. This will have repercussions across the Med-basin in economic, political, and potentially military terms. Farther away, the African continent is particularly at risk of compounded climate, ecological and fragility risks. The materialisation of these risks is likely to lead to various conflicts, transnational threats, and displacement patterns, many of which will lead to repercussions beyond African borders.

And looming in the background, it is necessary to keep an eye on experimental climate alternating technologies or geoengineered responses to the climate crisis. Some countries are already implementing geo-engineered solutions to climate challenges such as drought and desertification. Interfering with already disrupted bio-physical processes with the intent to redirect them for national interests is risky, to say the least, since the consequences are unpredictable as much as they are shared. The impacts will not stop at any national border. Over time, impacts of technological responses to ecological challenges may turn into collective security threats.

Addressing the security dimensions of climate change must begin by taking actions at the ecological root of the problem ... It is about making NATO part of the solution on ecological drivers of insecurity.

Progress concerning Women, Peace and Security (WPS) needs to evolve to include gendered aspects of climate change and other non-traditional threats to security.

NATO recognises the disproportionate impact that conflict has on women and girls, the vital roles women play in peace and security, and the importance of incorporating gender perspectives in all that the Alliance does.¹ In addition, there is increasing recognition that women and girls already at risk to the gender-differentiated impacts of armed conflict because they are living in societies in which they are marginalized are even worse off if also experiencing the negative impacts of environmental degradation and climate change.²

In referring to the United Nations Security Council Resolution (UNSCR) 1325 on Women, Peace and Security (WPS), Clare Hutchinson, the Secretary General's Special Representative for Women, Peace and Security wrote that "The resolution illustrates the disproportionate and harmful affect that conflict has on women and girls and stresses the need for full participation of women as active agents in peace and security." She added, however, "But if the conversation around WPS doesn't evolve with the environment and consider gendered aspects of pandemics, cyber security, disinformation, and climate change, it will lose the potency that has propelled it thus far."³

Therefore, the NATO 2030 process must take into consideration the impact on and the role of women and girls in all its aspects, and make sure that they are given a role in designing and developing strategic responses to climate change.

It is critical to frame climate change correctly as a growing security challenge stemming from ecological disintegration.

As such, addressing the security dimensions of climate change must begin by taking actions at the ecological root of the problem. This is not just about ensuring that NATO becomes carbon neutral and plays its part, although it is naturally important. It is about making NATO part of the solution on

¹ NATO. "Women, Peace and Security". NATO. 1 October 2020.

https://www.nato.int/cps/fr/natohq/topics_91091.htm?selectedLocale=en

² Interview with Jody M. Prescott, author of *Armed Conflict, Women and Climate Change*, Routledge, December 2018. In *The Three Swords Magazine*. No 34 / 2019.

https://jwc.nato.int/images/stories/news_items/2019/three-swords/BookReview2019.pdf

³ Hutchinson, C. "Are we there yet? Implementing the Women, Peace and Security agenda: if not now, when?: Thoughts from Clare Hutchinson, the Secretary General's Special Representative for Women, Peace and Security". NATO, 16 November 2020. https://www.nato.int/cps/en/natohq/news_179451.htm

ecological drivers of insecurity. Climate change does not just stem from breaking the carbon cycle, but the hydrological cycle too. The movement of water from underground into the atmosphere is a central phenomenon regulating the global climate regime, which terrestrial and marine ecosystems regulate and enable them to function. NATO knows this, having already contributed efforts to regenerate the Aral Sea in the past. The collective ability to regenerate these ecosystems so as to restore the hydrological cycle will determine the success of our fight against climate change and against its disruptions. It will also determine our ability to avoid trapping humanity in a scarcity problem of its own making. Scarcity results from encroachment on ecosystems. It is also often the bedrock of conflicts, and importantly, of transnational crime relying on scarce commodities in exponential demand.

Consequently, regenerating water-retention landscapes is key to fighting global climate change and key drivers of conflicts.

Recreating water-retention landscapes through natural landscaping practices, and regenerating seascapes is about rebooting ecological functions. This yields a number of benefits: working towards the re-regulation of the global climate regime through ecological functions on the long-term; mitigating the impacts and intensity of climate-disruptions in the short-term; restoring food and water security; and rebooting ecosystems services that provide the underlying conditions for security, including health and environmental security. Adopting natural engineering within its array of activities means that NATO can become a vessel for climate adaptation, mitigation, and reversal, as well as for holistic security stabilisation.

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1.5

Climate Change and Environmental Collapse: Scope of Responses

By Olivia Lazard

NATO should not just conceptualise the systemic threat of climate change and environmental degradation in terms of impending impacts to manage; the organisation should also pre-emptively address the drivers of change to avoid systemic security breakdown.

The climate security agenda has largely focused analytical efforts on identifying future impacts of climate change on violence, conflict, and instability. Responses have mostly focused on preparedness efforts for operational resilience in hostile environments. It lost sight of the fact that climate change is an unfolding phenomenon in which preventive, pre-emptive and management actions can be taken to ensure prevention, mitigation, and adaptation. NATO should frame the challenges of climate change and environmental collapse holistically, and relate them to systemic risks, insecurity, and destabilisation. It does not mean changing its mandate, but rather adapting to diffuse risks and vectors of insecurity. NATO must understand that in a climate-disrupted world, prevention and pre-emptive management are part of a pro-active approach to address the fundamental drivers of global destabilisation. For NATO, this should now translate in a large array of new and increased action in NATO and for NATO: information & analytics, pre-emptive disaster management; disaster response preparedness; deconfliction mandates; operational and capability changes; deterrence and cooperation, ecological regeneration.

NATO should frame the challenges of climate change and environmental collapse holistically, and relate them to systemic risks, insecurity, and destabilisation. It does not mean changing its mandate, but rather adapting to diffuse risks and vectors of insecurity.

Responding from within: NATO should adapt internally to the growing challenges.

Climate and environmental security should not be compartmentalised as a specialised competency or field of action. They should both permeate how NATO conceptualises security, its mandate and of its operations and be the focus of some teams dedicated to analysis, strategy, and action design. This has various implications: from reviewing the relevance of NATO's treaty to today's challenges, to educating NATO staff cross institutionally about climate and environmental security; to recruiting and nurturing certain key competencies that underpin NATO's specific approaches towards climate and environmental security; to appointing a special advisor on ecological security to the Secretary General.

Responding externally: NATO should adapt its strategies, analytics, and operations to a globally changing environment.

NATO will need to build upon internal changes to become more strategic and operational in a changing world. This will mean developing new intelligence and analytical capabilities; building upon current

partnerships to integrate environmental actions; approach geographies such as the Arctic and the Mediterranean with environmentally based deconfliction approaches and develop environmentally oriented operations in conflict theatres.

Address ecological disintegration as a root driver of insecurity and a threat to international and alliance security.

Prevent, mitigate, adapt to and repair ecological disintegration are new categories of actions that should stem from understanding the ecological root drivers of emerging climate-related and environment-related risks to security. It is both a political and a military competency that NATO is in a unique position to take on, so as to actively contribute its capabilities to the stabilisation of the global climate regime and of key theatres. These categories of action will translate in various areas: from the repurposing of some in-house NATO capabilities for integrated regeneration and stabilisation to cooperating with key agencies on transnational crime related to environmental degradation.

Analytical and intelligence systems and capabilities ... should include ecological, socio-economic, institutional, criminal, and political data sets. Beyond analytics and early-warning systems, NATO should also deepen its reflection about what early action means for itself, and in terms of cooperation as well as partnerships.

Reconceptualize, anticipate, and analyse multi-dimensional risks, threats, and cascading effects.

In a biophysically interconnected and economically globalised world, one shock manifesting somewhere can reverberate with cascading effects everywhere. This is becoming truer with accelerating climate disruptions. Security threats are more dynamic, more systemic, and more diffuse in nature. Analytical and intelligence systems and capabilities should thus evolve accordingly. They should include ecological, socio-economic, institutional, criminal, and political data sets. Beyond analytics and early-warning systems, NATO should also deepen its reflection about what early action means for itself, and in terms of cooperation as well as partnerships with other actors.

Be ready for protracted disaster management and fragility.

Connected to information and analytics systems, NATO should first and foremost utilise foresight to anticipate where and how bad climate-disruptions will hit. It is essential that NATO members discuss the role of the alliance with regards to both pre-emptive disaster management (related to landscaping approaches) and disaster response (operational and humanitarian response) within the alliance itself, and with partner countries. NATO will particularly benefit from cooperating with the earth system analysis centres, such as NASA and the European Space Agency's Copernicus on this matter.

Decrease environmental impacts of operations and supply chain.

NATO and its members should continue to consider their own impact on environmental degradation and climate change from committing to the energy transition itself, to understanding what impact its energy use and capability functions have on raw material extraction to preventing and remediating the impact of its training and operations in theatres. This is a matter of credibility and legitimacy in its climate- and environment-security role. In light of geopolitical competitions related to transition models, it is also a matter of high priority for security purposes.



1.5: Civil-military cooperation has proven to be extremely helpful on many occasions. Here the Former UK Minister for Women and Equality, Justine Greening, is visiting the UK military who are helping to build Kerry Town Ebola treatment centre in Sierra Leone. This treatment centre will deliver 92 urgently needed beds to help look after those with the virus and help prevent further spread. It is the beginning of a UK-led action plan to deliver 700 treatment beds across the country.

Build your own capacity and awareness, and partner with others.

Education, training, and cross-institutional analysis should continue to be mainstreamed and deepened within NATO to ensure that climate and environment-related risks and threats are appropriately understood and addressed. NATO should work on its own internal mainstreaming and curriculum to address these new challenges comprehensively. NATO could also consider setting up educational partnerships with partner countries to improve analytical frames and information flows on the said risks and threats.

Cooperate with partners on information flow, strategy design and preparedness.

NATO is an actor with unique capabilities to address climate and environment-related risks and threats. It is however only as strong as the partnerships and cooperation alliances that it organises. The challenges of climate change and environmental collapse are collective. Responses should therefore be a shared responsibility.

Continue to involve the youth.

While NATO has involved students and young professionals in the NATO 2030 process it would be helpful to involve even younger representatives into NATO processes, perhaps informally, especially in consultation and strategy design and vision, alliance building, cooperation and convening or in reviewing effectiveness which can also help to inspire young people even more for the protection of common goods and respecting planetary boundaries.

PART 2: Challenges and Responses

2.1

Reconceptualizing Risks and Security

By Marie Lamensch and Ashley McIlvain Moran with Georgios Kostakos and Olivia Lazard



2.1: Global Warming: A quarter of the planet is in the process of desertification (And Europe Is among the most affected)

The impacts of climate change are already evident and growing,¹ and climate modelers note that even the most advanced models likely underestimate the pace and impacts of climate disruptions to come. The cascading effects emanating from climate change and environmental degradation reflect complex systems, with multiple causes and multiple orders of consequences across the globe.

These cascading effects exacerbate ecological and human vulnerability. They can lead to market failures related to commodities fundamental to food and water security. They can affect infrastructures, including military ones, in low-lying coasts and other vulnerable areas. Within this complex system, the diverse risks stemming from climate change are at once acute and latent, rapid, and slow, pervasive, and isolated. What we know is that these risks will grow in intensity and disruptive qualities, and they will intersect with changes in national and global power dynamics.

¹ IPCC 2014; IPCC 2018.

The diverse and complex threats posed by climate change require NATO to reconceptualise its approach to threats, risks, and security. In this reconceptualization, it is critical that NATO approach security in a multi-dimensional way through human, economic, socio-political, ecological, and military lenses. Only by doing so will NATO be able to adapt to these unfolding challenges strategically and operationally.

Climate and environmental risks are not just outside the Alliance anymore. Not only can climate disruptions take place within the Alliance itself, but climate disruptions outside the Alliance remit can quickly permeate the Alliance because of interconnected economic, socio-political, and energy systems in today's world. Understanding the systemic and interdependent nature of climate risks—and adopting appropriate responses that address root causes of associated insecurity and instability—are central challenges for NATO in supporting sustainable peace and security in a changing climate.

Understanding the systemic and interdependent nature of climate risks—and adopting appropriate responses that address root causes of associated insecurity and instability—are central challenges for NATO in supporting sustainable peace and security in a changing climate.

Climate disruptions and fragility

While climate change is affecting many places, it poses a particularly stark and increasingly urgent security threat in fragile and conflict-affected contexts, where government capacity and community resilience are already strained.² Climate hazards can directly threaten human life where populations cannot adequately mitigate, prepare for, or respond to those hazards. Climate hazards can further, indirectly, threaten human and political security by straining food and water resources, undermining livelihoods and creating tensions over resources (particularly where populations rely on agriculture), reversing development gains, and increasing displacement. A government's ability and willingness to manage these climate stressors and follow-on social and economic processes that can contribute to conflict affect whether a population becomes more or less vulnerable to the climate hazards it faces. Assessing combined climate-fragility risks thus provides important insight into how climate-stressed states can spiral into instability and, conversely, how effective interventions can prevent this.

New global data allow us to better pinpoint the convergence of climate and fragility risks. Combined climate-fragility risks within countries are highest across sub-Saharan Africa, the Middle East, and North Africa, and South and Southeast Asia,³ thus affecting many NATO partner countries and areas of operation. Climate and fragility risks can also interact across nations due to interconnected systems. The Arab Spring, for example, demonstrated that crop failures in Russia, Canada, China, and Argentina led to spikes in staple crop prices, exacerbating unequal access to food and systemic injustices across the Middle East and North Africa. What started as a market failure turned into a series of revolutions.

These political upheavals in turn contributed to military and political confrontations within and across countries and eventually contributed to political instability in neighbouring regions like Europe through the influx of displaced populations. Climate change is not just a threat multiplier—it is a game changer for current socio-economic and political paradigms. If it is not handled preventively and

² Rüttinger et al. 2015.

³ Moran et al. 2018.

collectively, it can have severe security implications that can increase over time as the level of disruption increases.

Climate change is not just a threat multiplier – it is a game changer for current socio-economic and political paradigms. If it is not handled preventively and collectively, it can have severe security implications that can increase over time as the level of disruption increases.

Potential NATO role

NATO has played an important role in supporting past workshops, training courses, and multi-year projects on environmental security risks in partner nations. These activities were supported by NATO's Science for Peace and Security (SPS) and Partnerships for Peace (PfP) Programmes. From 2004 to 2014, NATO was also an associated partner of the Environment and Security (ENVSEC) Initiative under which six international organisations coordinated their activities to address environmental and security risks across Europe, the South Caucasus, and Central Asia.

Moving forward, NATO could play a key role in building predictive and preventive capabilities to address crisis risks stemming from climate disruptions. NATO already possesses an advanced early warning system to anticipate politically driven crises. This system could be applied to track crisis risks from climate disruptions by broadening the system's conceptualisation and metrics of risks to account for the complex chain of impacts that climate change can have on civilians and on peace. In order to monitor these risks and deliver adequate strategic foresight, NATO's warning and analytics systems will require multiple types of data: qualitative human security analyses, quantitative economic and political indicators, satellite data on ecological health, and routine infrastructure and capacity assessments. Importantly, governmental and nongovernmental organisations already collect much of these data that could be integrated into a NATO framework.

NATO risk assessments and foresights could then be used to: 1) continuously monitor the threat environment related to climate and environmental risks that may affect the Alliance's security; 2) build NATO capabilities to anticipate threats from climate-related disruptions; 3) identify where climate-related pressures may exceed state capacity to respond and thus threaten stability and human security; 4) support military planning in partner nations to address climate-related disasters and insecurity; and 5) assist partner nations with reconstruction of basic infrastructure and services following disasters and with new infrastructure development where needed to ensure equitable access to material well-being. Doing so will support NATO's efforts to build resilience and security at geopolitical, ecological, and human levels.

RECOMMENDATIONS

1. Broaden NATO's human security paradigm to include crisis risks from climate stress, orienting this work toward a prevention- and resilience-based approach.
2. Create a shared framework for assessing and responding to conflict risks and threats to civilians stemming from climate disruptions. Integrate this framework into an expanded early warning system that accounts for the complex chain of impacts that climate change can have on civilians and peace.
3. Expand NATO's early warning system to account for potential crisis risks from climate stress. This will require investment in development of a robust analytics and intelligence system that incorporates varied data to represent a multi-dimensional human security model including climate disruptions and defines clear metrics to assess these integrated risks.
4. Include climate-fragility risk analysis as a formal consideration in NATO operations focused on projecting stability beyond its borders ⁴ and require the presence of Environmental Advisors on every NATO mission.
5. Run annual foresight, simulation, and scenario-development exercises on multi-dimensional threat horizons including climate disruptions.
6. Recruit a special advisor to NATO's Secretary General on climate and environmental issues.
7. Improve the integration of climate change considerations in the NATO operations planning process by including appropriate content within documents such as the Allied Command Operations Comprehensive Operational Planning Directive (ACO COPD).
8. Establish a learning-based cooperation network with the EU, the OSCE, the UN, and the AU to ensure that climate and environmental risks are understood, identified, and analysed collectively and that collective responses are discussed on the basis of shared information.
9. Provide funding for case studies to analyse the impact of climate change and environment degradation in key areas or key theatres and test different approaches to conceptualisation of security. Use such case studies to study the impact of climate-related disruptions on the future operational and strategic capabilities of NATO. Share results within the Alliance.

⁴ adelphi, UNEP, and EU (2019) provides an example of how to identify climate-fragility risks and develop policy responses.

RECOMMENDATIONS - Continued

10. Provide funding for case studies to analyse the impact of climate change and environment degradation in key areas or key theatres and test different approaches to conceptualisation of security. Use such case studies to study the impact of climate-related disruptions on the future operational and strategic capabilities of NATO. Share results within the Alliance.
11. Support NATO partner countries with climate and environmental risk analysis. Develop a NATO partner network designed for collective learning and capacity building in this area.
12. Support NATO partner countries with humanitarian assistance as soon as a climate disaster occurs.

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2.2

Responding to Disasters

By Georgios Kostakos with Olivia Lazard

The COVID-19 pandemic has once again demonstrated the need to call on the military to augment at short notice the capacities of the civilian arms of government, notably the national health services and logistics mechanisms, in order to be able to treat patients in makeshift hospitals, distribute protective gear and vaccines, organise the relevant logistics operations. For other emergencies too, like those caused or exacerbated by climate change, such as wildfires, hurricanes, floods, or droughts, the mobilisation of military equipment, specialist engineering and logistics, medical forces and troops can make the difference between life and death for thousands of people. The response to human-made disasters, such as major industrial or nuclear accidents, oil spills or dam collapses also require large scale interventions that military assets can help mount. The national militaries are increasingly being drawn into such duties by the civilian authorities in many countries.

NATO is already active in civil emergency response through the Euro-Atlantic Disaster Response Coordination Centre (EADRCC). ... What is proposed here is a step change through a thorough reconceptualization of disaster response efforts and their incorporation into the mainstream of NATO activities, as the relevant needs are expected to mount in the coming years.

How can NATO help improve the performance of the relevant tasks by military forces and strengthen cooperation among allies, partners, and others, as necessary, in view of such threats to human security being here to stay and claiming more lives than wars at least in the Euro-Atlantic area? NATO is already active in civil emergency response through the Euro-Atlantic Disaster Response Coordination Centre (EADRCC) ¹ that operates 24/7 and involves all NATO member and partner countries. It primarily functions as a clearing house for tracking and matching requests for and offers of assistance for natural and human-made disasters. It works closely with the UN Office for the Coordination of Humanitarian Affairs (UN OCHA), which is the primary coordinator of international disaster relief efforts. In its coordination role among NATO members and partners, the EADRCC also promotes information-sharing through seminars for the dissemination of good practices and conducts large scale field exercises involving NATO members and partners, as well as other international organisations. There is, therefore, a good basis to build on for this side of NATO activity vis-à-vis the increasing threats to human security.

What is proposed here is a step change through a thorough reconceptualization of disaster response efforts and their incorporation into the mainstream of NATO activities, as the relevant needs are expected to mount in the coming years. There is virtual certainty that climate disruptions are accelerating across the globe in pace, intensity, and impacts, with direct repercussions on individual,

¹ See https://www.nato.int/cps/en/natohq/topics_52057.htm?

societal, infrastructure and economic security. Over time, they may overwhelm the response capacity of affected countries and undermine their governance structures and political stability, especially of the more fragile countries, which can contribute to violence and generalised insecurity. Pandemics are also expected to become more frequent, as humanity infringes on the natural world and diseases spread from other species to humans. There is also the possibility of human-made disasters, from industrial or nuclear accidents to oil spills, mine and dam collapses. Vital supply chain disruptions, from foodstuff to medical equipment or other commodities due to natural or human-made reasons may also need to be bridged temporarily to avoid major human suffering.



2.2: Airmen from Keesler AFB deliver bottled water to Hurricane Katrina victims, Biloxi, U.S., 06 September 2005.

Under these circumstances, a modern military at the national level and a modern, attuned to the times alliance at the collective level, can only gain in purpose and legitimacy if they increase and systematise their involvement in civil emergency response. A “dual use” thinking for personnel, equipment and processes would enable NATO to play a key role in enabling this in practice. This could include from standardisation of equipment characteristics for key civil emergency uses to the systematic registration and sharing of good practices, the inclusion of relevant planning and execution tasks in regular training, improved civic-military cooperation and joint exercises. It could also include the better use of surveillance capacities for early warning and prevention, as well as real time tracking and containment of disasters. Of course, in this latter case but also across the range of civil emergency response tasks, there has to be a “firewall” between such tasks and the military defence aspects, to avoid misunderstandings and other complications, notably when NATO capabilities are deployed for emergency response outside the territory of member states. In fact, if properly planned and conducted civil emergency response operations can serve for building bridges with potential adversaries and can contribute to an increase in the overall level of security, including in the traditional military sense.²

² It is interesting to note in this regard that EADRCC was established in response to a Russian proposal in the late 1990s, in the context of the then Euro-Atlantic Partnership Council.

An important aspect that should not be missed is shielding military installations and equipment from the increasingly intense impacts of climate change, like temperature spikes, sea-level rise, hurricanes, and floods, to ensure that no disaster is caused within or more broadly because of them. That should be part of the adaptation side of NATO's climate action strategy, which should also include the significant reduction of greenhouse gas emissions by military installation (mitigation), as part of reaching the Paris Climate Agreement goals.

The recommendations that follow provide ideas for specific actions that can be considered by NATO, its members, and partners. Broader mobilisation for pre-emptive action or use of large-scale interventions to address the causes of disasters, for example "geo-engineering" solutions in response to climate change, are considered out of the scope of this chapter. Major decisions on whether such interventions should be attempted can only be taken at the highest political level and require global support, due to the potential repercussions for the planet and all its occupants. Should any such decisions be reached the use of military assets could subsequently be considered on an as needed basis.

RECOMMENDATIONS

1. **Build an inventory of good practices in using military assets to respond to civil emergencies through a questionnaire to be addressed to all NATO member states and partners.**
2. **Support development of a dataset tracking military involvement in responding to domestic and foreign disasters.**
3. **Systematise standard setting for military equipment, personnel training, as well as cooperation and coordination protocols for the use of military assets in civil emergency response.**
4. **Invest in capacity building courses for key military personnel in civil emergency response, so that they can plan accordingly and be prepared to interact with civilian capacities through a pre-developed interface, command structure and ToR/division of labour. Such activities should also involve, partly at least, civilian personnel from other branches of government. Regular courses could be provided by the NATO School in Oberammergau and the NATO Defence College in Rome.**
5. **Conduct regular exercises to promote good practices in early warning, planning, coordination, and actual operations in response to civil emergencies, with the participation of military and civilian personnel and equipment from NATO member and partner states, and possibly other states and regional or global organisations.**
6. **Elaborate further existing cooperation protocols with other organisations like the UN (UN OCHA) and the EU (European Civil Protection and Humanitarian Aid Operations).**
7. **Consider formalising cooperation in this area through a "Civil defence pact against natural and human-made non-military emergencies" that could be open to accession by NATO member states, cooperating countries and organisations, and even other powers like the BRICS.**

RECOMMENDATIONS - Continued

8. Invest into early warning information systems and cooperate with Copernicus (EU) and NASA (US) earth systems departments to continuously generate an alliance-wide capability to anticipate disaster or follow development and plan adequate responses.
9. Examine the infrastructure vulnerability of military and training Alliance sites and start developing an adaptation strategy to pre-empt climate- and otherwise-induced emergencies.

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2.3

Environmental Protection, Intelligence and Remediation

By Chad Briggs, Shirleen Chin, Olivia Lazard and Dominique Noome with Antoine Brun-Buisson, Susanne Michaelis and Amanda Rude

The interplay between climate change and environmental protection is often misunderstood. Yet it is an essential dynamic to understand the fundamental drivers of climate change, current and future conflicts as well as insecurity dynamics. Terrestrial and marine ecosystems are the natural pillars regulating the global climate regime. On land, the integrity of terrestrial ecosystems is determined by the health of soils, water and biodiversity making up each of these ecosystems. However, human activity has largely led to various encroachment on ecosystems, resulting in water scarcity, depletion of soil fertility, and finally to the commodification of vegetal and animal biodiversity. Illicit environmental trade now ranks as the fourth most important illegal trade worldwide.¹



2.3: UAVs and other surveillance devices are increasingly used in the protection of the environment.

The growing assaults on biodiversity and environmental resources are leading to various results: 1) the growing scarcity of biodiversity is contributing to higher prices on illegal markets. In other words, scarcity makes for increasing criminal business activities at transnational level. Certain regions are central to these trades, such as Africa and Latin America. The transnational criminal activities are increasingly contributing to the merging of hybrid threats and conflict systems across and between

¹ Audrey Garric, “Le braconnage d’espèces sauvages, 4e marché illégal au monde”. *Le Monde*, 14 décembre 2012. https://www.lemonde.fr/planete/article/2012/12/14/le-braconnage-d-especes-sauvages-4e-marche-illegal-au-monde_5982082_3244.html

continents, forming loose mega-networks; 2) the growing assault on environmental resources are contributing to drought, soil depletion (and therefore loss of fertility which is the backbone of agriculture),² health hazards (such as epidemics and pandemics) and human rights abuses. These latent phenomena constitute slow onset drivers of political destabilisation, conflicts, and insecurity since they closely connect with loss of livelihoods in many parts of the world; and 3) these continuous and exponential assaults on ecosystems (terrestrial and marine) lead to ecological depletion, which itself contributes largely to structural drivers of climate change through the breaking of ecological interdependencies that regulate planetary functions. Even if human societies were to switch away from fossil fuels tomorrow, but continue their assaults of terrestrial and marine ecosystems, the global climate regime would still keep on changing irremediably. The fight against biodiversity loss, environmental depletion and hazards is therefore central to the fight against climate change as well as against the collapse of food and water systems worldwide.

Tensions are known to arise when non-renewable resources such as fossil fuels, minerals and groundwater are at stake. ... When combined with compounding socio-economic and political variables, the scarcity of natural resources and lucrative income derived therefrom exacerbate the risk of conflicts.

These issues are intimately connected to the destabilisation of society, and eventually, to conflict at local, national, regional, and potentially international scales.

Tensions are known to arise when non-renewable resources such as fossil fuels, minerals and groundwater are at stake. An analysis of conflict data by the Heidelberg Institute shows that 87 out of 358 (24%) recorded violent crises in 2019 stem from conflicts over natural resources or the profits they generate.³ When combined with compounding socio-economic and political variables, the scarcity of natural resources and lucrative income derived therefrom exacerbate the risk of conflicts.

Organised crime is a security risk that undermines law enforcement and destabilises the rule of law. The connection between organised crime and environmental crime is still contested when it should not be. This link has undermined and will continue to undermine international security if left unaddressed. Whether as a strategic or opportunistic means, some terrorist groups have used proceeds from wildlife crime to finance their activities.⁴

Even more, the growing scarcity of natural resources make them more amenable in conflict theatres to instrumentalization and weaponization. For example, ISIS militants in Iraq restricted water flow to

² "Environmental crime threatening peace and security, finds new INTERPOL-UN Environment report", *UNEP*, 8 December 2016,

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⁴ M Ejigu, "Post Conflict Liberia: Environmental Security as a Strategy for Sustainable Peace and Development". 2016: Working Paper No. 3. Accessed 29 January 2021.

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Bagdad, or polluted drinking water with oil, burned fields and flooded houses as part of their terrorizing campaign. Although weaponization goes back centuries, the increasing degradation of natural resources will make them increasingly targets for weaponization purposes.

If anything, the current COVID19 pandemic finds its origins in the failure of governments in monitoring wildlife/environmental crime and the repercussions have taken a global toll. Aside from the lives lost, economic, social, and political disruptions are showing how systematic degradation of environmental resources and biodiversity collapse connect, more than ever before, to security and geopolitical dynamics. This goes to show that the failure to protect the environment can have compounding effects on global security. Ensuring environmental protection can take many forms but collective defence strategies, cooperation and continuous process of reform underpinned by the concept of protection of the environment can make NATO better at meeting the challenges of the future. Should NATO acquire this competency, it does not discharge by any means national competencies from their own responsibilities regarding the management of natural resources and environmental protection. Rather, collective security approaches towards environmental protection should be taken up in recognition of the transnational nature of threats contributing to assaults on environmental resources as well as of the transnational consequences of failing to enact environmental protection at national levels.

Military forces are increasingly called upon to undertake HADR missions, and environmental hazards and changes degrade operational effectiveness, logistical integrity, and critical infrastructure. Yet early warning of these risks, and effective communication of risks to defence planners and policymakers, remains an enormous challenge.

In addition, climate change and related energy and environmental risks can easily translate into tangible and concrete security concerns for NATO members and partner countries. Military forces are increasingly called upon to undertake HADR missions, and environmental hazards and changes degrade operational effectiveness, logistical integrity, and critical infrastructure. Yet early warning of these risks, and effective communication of risks to defence planners and policymakers, remains an enormous challenge.

These challenges can be summarized as:

1. Environmental systems are often non-linear, meaning that changes can be abrupt and can shift suddenly even after marginal changes to factors like sea surface temperature or precipitation.
2. Critical security risks are not always obvious and can occur as a result of cascading impacts from changes that are either distant or not well monitored.
3. Intelligence agencies are historically and bureaucratically centred on secrecy and traditional security threats, making data sharing and communication difficult.

With the US now undertaking its first National Intelligence Estimate on climate change, opportunities and needs exist for greater warning intelligence on environmental security and disaster risks. Effective warning can assist both mitigation and adaptation efforts, as well as military planning for HADR missions.

RECOMMENDATIONS

1. Dedicate an office within the Joint Intelligence and Security Division (JISD) at NATO Headquarters to foresight and environmental intelligence, to coordinate with the Science for Peace and Security (SPS), relevant Centers of Excellence (COEs), and NATO member state intelligence agencies where appropriate.
2. The METOC Working Group could initiate studies bringing together relevant players from inside and outside NATO's structure, including Europol and Interpol. NATO's SPS Programme could support a kick-off workshop for such studies.
3. Invest in open-source environmental intelligence resources, including satellite imagery, climate modelling and monitoring, and develop NATO as a potential clearinghouse for members and partners with fewer capabilities.
4. Deepen structural partnerships and cooperation with INTERPOL, EUROPOL and UNODC to boost intelligence gathering and collective actions against maritime piracy, environmental trafficking, and monitor linkages between organized crime and terrorist organisations.
5. Include the topic Environmental Protection in the next NATO Strategic Concept and Declarations.
6. Implement NATO EP standards and EP audits in all NATO missions (e.g. training and operations).
7. Further develop NATO's policies, doctrines, and standards with the aim to strengthen EP as a means for the overall success of a mission.
8. In active theatres, identify and neutralise any chemical weapon with potential consequences for environmental hazards and human security (emulating for example OPCW's innovative but successful strategy to transport and destroy Libya's remaining Category 2 chemical weapons in advance of ISIS targeting checkpoints close to the storage facility).
9. Increase professional military education (PME) for NATO, members, and partners, with emphases in climate and environmental hazards, disaster planning, and environmental threat assessment.
10. Develop doctrine and training for assessing, preventing, and dealing with weaponization of natural resources in the military decision-making process.
11. Research modern technologies that can be used in early warning: sensors connected to LoRa networks can give instant feedback on changing water levels, altered composition of drinking water, etc. This can then be used to task military units and warn local communities of any dangers. Share the knowledge with NATO members.

RECOMMENDATIONS - Continued

12. **Staffing:** Ensure that adequate 'environmental' capacity is present on NATO missions, not only to do Environmental Impact Assessments, but also to provide early input on environmental concerns in the decision making and targeting cycle. Another key role for the Environmental Advisor is to monitor and assess local contractor's ability to provide services within environmental legislation and is held accountable.
13. **When active in theatre,** NATO should integrate environmental remediation and regeneration as a way as part of reconstruction efforts. Although strategic assessments on water systems and infrastructure is often carried out, few of these deal with restoring ecosystems and their (future) services, despite their central structural role for human and environmental security.

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2.4

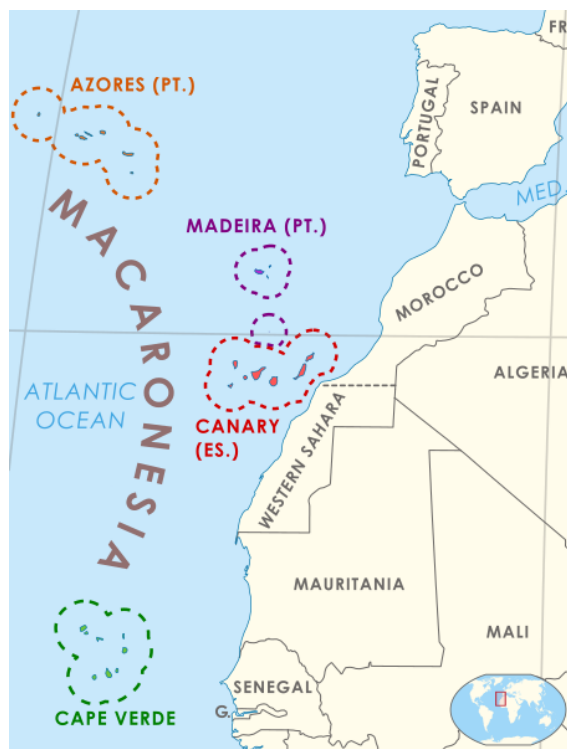
Emerging Theatres: West Africa and Macaronesia

By R. Andreas Kraemer with Ashley McIlvain Moran

West Africa and the adjacent sea areas (and island states) of the Gulf of Guinea and Macaronesia (the marine biogeography of archipelagos from the Azores via the Madeira Group, the Savage Islands, the Canary Islands all the way to Cape Verde) are the Southwest neighbourhood of NATO, which has not been addressed as much as the Eastern and Central segments of NATO's "Southern Flank", including the Mediterranean.

That needs to change, because it is an area where illegal, unregulated, and unreported (IUU) as well as excessive fishing mixes with transatlantic trafficking (of animals and plants, drugs, guns, and humans) and migration (from Africa to the Canaries, but also across the Atlantic). Drug trafficking (from South and Central America to the Gulf of Guinea and West Africa through trafficking hubs, such as Guinea Bissau) has been a very important driver of instability for the region and neighbouring regions in the last 15 years. Sea routes have been partially replaced by flight routes, thanks to widespread collusion of state authorities in African states.

The maritime crimes in the Gulf of Guinea, such as piracy and armed robbery, impact human security, with more kidnapped for ransom in 2020. The suspect pirates' capacities, range, and skills are projected to grow as they did in East Africa to create a significant challenge to shipping and offshore facilities, hampering development and economic growth.



2.4: Map of West Africa and Macaronesia.

According to the International Maritime Bureau (IMB), the first nine months of 2020 saw “a rise in piracy and armed robbery in seas, with a 40% increase in the number of kidnappings reported in the Gulf of Guinea [...] to 132 attacks, up from 119 incidents in the same period of 2019. Of the 85 seafarers kidnapped from their vessels and held for ransom, 80 were taken in the Gulf of Guinea – in 14 attacks reported off Nigeria, Benin, Gabon, Equatorial Guinea, and Ghana. [...] Seafarers reported 134 cases of assault, injury, and threats, including 85 crewmembers being kidnapped and 31 held hostage onboard their ships. A total of 112 vessels were boarded and six were fired upon, while 12 reported attempted attacks. Two fishing vessels were hijacked, both in the Gulf of Guinea. [...] Approximately 95% of global kidnappings reported from within Gulf of Guinea.”

Activities related to oil in the Gulf of Guinea are also strategically relevant for many NATO member states. In 2020, for instance, Italy deployed 400 military units to protect offshore oil facilities and secure maritime trade routes in the area and to reinforce cooperation with African partners enhancing surveillance and counter-piracy.

In addition, global overheating and the resulting climate hazards in the region compound these security challenges. The region faces exceedingly high drought risks (particularly across Sierra Leone, Guinea, other coastal areas, and Nigeria), extreme temperatures, flooding, wildfires (particularly in southern Nigeria and Mali), and storm surge in coastal areas.

All these activities and developments erode stability and feed insecurity in a region with weak governance and little resilience in parts. Insecurity in the region has the potential to spill over to NATO countries. The activities aggravate conflicts in West and North e.g., in Mali, Niger, Burkina Faso), and Libya) and create grounds for criminal activities using the Gulf of Guinea coastal States as entry points of illegal goods. An example of these goods is the gun smuggling and trafficking through this region that ends up as far away as Syria.

Recent analysis by ACLED shows that Africa is the only region where political violence increased in 2020, with violence in the Western Sahel in particular increasing for the last five years. ACLED also finds that non-state armed groups now outnumber state security forces in Africa four to one. The latter point is not specific to West Africa but does underscore the stabilizing role that external partners could play in building capable, accountable security forces. There is currently external military support to the region, particularly from France and the United States, but little cooperation across the civilian/military divide outside the CivMil Engagement Sub Sahara at the NATO JFC Naples.

Diplomatic and political will is needed for a more cooperative and collaborative approach, especially from the international community. NATO offices can take a role in the region, using their knowledge, capabilities, entities, and expertise in some areas, if the right approach is made, primarily through the Allies with interests in the region.

Since September 2017, NATO has made an effort to better understand its Southern flank by creating the NATO Strategic Direction-South Hub. This acts as a meeting room which connects NATO allies and partners with subject matter experts from local and regional institutions including universities, research centres and non-governmental organisations from Africa and the Middle East so that all matters pertaining to the South can be better discussed, understood and, whenever possible, remedied.

Diplomatic and political will is needed for a more cooperative and collaborative approach, especially from the international community. NATO offices can take a role in the region, using their knowledge, capabilities, entities, and expertise in some areas, if the right approach is made, primarily through the Allies with interests in the region.

RECOMMENDATIONS

1. **NATO should:** Examine how ecological considerations can contribute to NATO's active approach to deconfliction in West Africa, the Gulf of Guinea and Macaronesia. Current energy and territorial disputes involving NATO members solely focus on narrow economic and geopolitical gains at the expense of systemic threat analysis. NATO should undertake research on foresight and scenario developments that enable NATO members to conceptualise West Africa, the Gulf of Guinea and Macaronesia through more holistic security dimensions, and therefore enable a different type of conversations around deconfliction in West Africa, the Gulf of Guinea and Macaronesia, paving the way for long-time cooperation for the protection and systemic regeneration of the region.
2. **Articulate a consistent, clear, coherent approach to its Southwest flank – West Africa, the Gulf of Guinea, and Macaronesia –** addressing both the traditional threats emanating from this region like terrorism and new risks like the growing presence of Russia and China and growing climate-related stressors. The relationship between multiple frameworks and activities (Projecting Stability, Framework for the South, Defence Capacity Building, Partnerships) should be defined more effectively – with different portfolios clearly allocated as they are in the Eastern and Northern flanks.
3. **Use West Africa, the Gulf of Guinea and Macaronesia as a case study to review and improve NATO's analytical and intelligence systems for security monitoring.** The convergence of human insecurity, socio-economic and institutional fragility, energy disputes, climate and environment-related risks driving ecological disintegration provide the perfect sandbox for a new type of analytics systems.
4. **Maritime security is one of the dimensions of enhanced cooperation, and NATO should remain a key actor in guaranteeing freedom of navigation against threats emanating in the Gulf of Guinea and, less prominently, some areas along the West African Coast.**
5. **Use West Africa, the Gulf of Guinea and Macaronesia to develop structural partnerships and cooperation with INTERPOL, EUROPOL and UNODC as well as the G7++ Friends of the Gulf of Guinea (FoGG) initiative to boost intelligence gathering and collective actions against maritime criminality, environmental trafficking, and monitor linkages between (un)organized crime and terrorist organisations.**
6. **Make the West Africa, the Gulf of Guinea and Macaronesia a case for EU-NATO cooperation endeavours, and support implementation of the Yaoundé Code of Conduct Architecture.**
7. **Make the West Africa, the Gulf of Guinea and Macaronesia a case for Brazil-NATO cooperation endeavours.**

RECOMMENDATIONS - Continued

8. Develop a regional NATO dialogue for West Africa, the Gulf of Guinea and Macaronesia. Deepen partnerships with relevant institutions such as ECOWAS, the (African countries in the) Community of Portuguese Language Countries (CPLP) and Brazil, the African Union (AU), and the EU, for collective and shared analysis on environment, climate, and human security threats.
9. Create new partnerships and deepen existing ones with countries in West Africa, the Gulf of Guinea and Macaronesia to monitor systemic risks.
10. Create a cooperation with partner countries in West Africa, the Gulf of Guinea and Macaronesia and NATO members to initiate environmental cooperation aimed towards the systemic security of the region.
11. Consider engaging into active coastal and marine regeneration in West Africa, the Gulf of Guinea and Macaronesia so as to reinforce the ecological resilience of the region and address root causes of insecurity, including food insecurity.
12. Increase NATO Science for Peace and Security (SPS) and related programmes focused on (maritime) domain awareness, environmental security, and hybrid/grey zone threats in West Africa, the Gulf of Guinea, and Macaronesia. Initiate events and trainings focused on (maritime) domain awareness, environmental security, and hybrid/grey zone threats in the region using the SPS Program and other appropriate NATO tools.
13. Integrate concepts of resilience and climate security in West Africa, the Gulf of Guinea and Macaronesia into NATO and members' strategic planning processes.
14. Update parliamentarians on issues affecting Western Africa, the Gulf of Guinea, and Macaronesia by using, for example, the NATO Parliamentary Assembly as a platform.
15. Engage West Africa, the Gulf of Guinea, and Macaronesia in NATO political consultations, including at the NAC.

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2.5

Emerging Theatres: The Arctic

By Chad Briggs, R. Andreas Kraemer, and Arne Riedel with Susanne Michaelis

Both environmental and geopolitical shifts have forced a refocus on the Arctic as a potential region of security concerns for NATO and its members. While a critical area during the Cold War, from the US/Canadian high Arctic to the Greenland-Iceland-UK gap, to the border with Norway and the USSR, tension in the region was de-escalated during the 1990s and 2000s.

Abrupt climate changes forced a re-examination of the region, with greater maritime access to the Arctic sea for commercial shipping and military activity, including from previously external actors such as China, South Korea, Japan, and India. Environmental changes in the Arctic, including significant changes to air and sea temperatures, loss of sea and land ice, and shifts of human and ecological populations, also have cascading impacts on more Southern latitudes and populations.

Both environmental and geopolitical shifts have forced a refocus on the Arctic as a potential region of security concerns for NATO and its members. ... exploring Arctic security is, with a look at the stakeholders involved, a promising future case of EU-NATO cooperation.

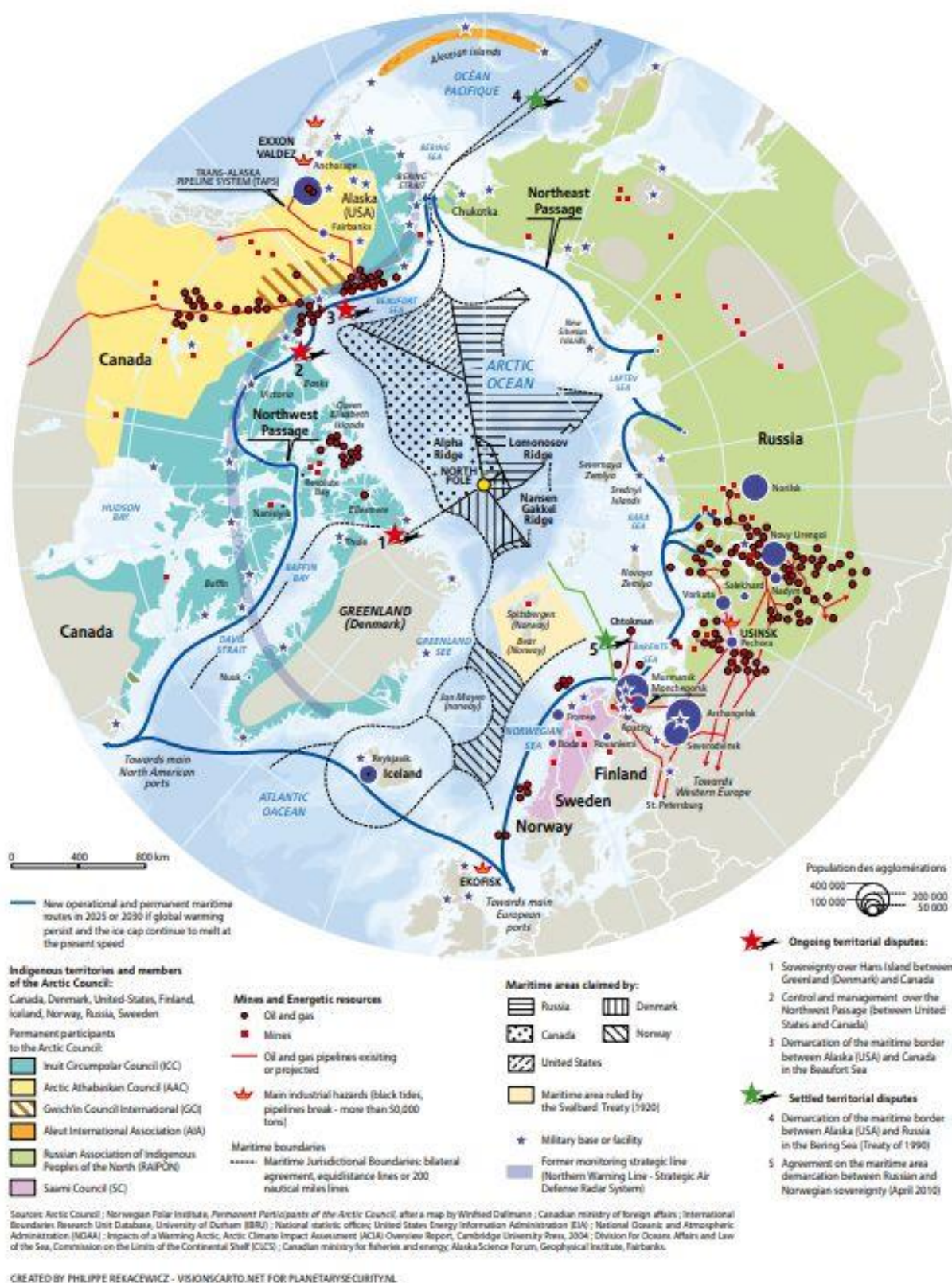
There is, in consequence, a need to better understand the causes and drivers of insecurity in the Arctic in order for NATO to develop an active approach to conflict avoidance in the region. Relatively minor territorial disputes (mostly over access to fossil energy resources) and potential conflicts of marine resources such as fish involving NATO member focus on narrow economic and geographical prizes. NATO should undertake research on foresight and scenario development that enable NATO members to develop a more holistic concept of security in the Arctic.

While many geopolitical issues in the Arctic are addressed in the Arctic Council (and to a lesser extent, the OSCE), while bilateral agreements can handle many issues (e.g. Norway and Russia border disputes), and while NATO has been testing its military preparedness as recent as 2018, there is also a need for NATO to assist in identifying and planning for grey zone, unconventional or even hybrid threats that stem inter alia from environmental shifts and their security implications in the region. Therefore, exploring Arctic security is, with a look at the stakeholders involved, a promising future case of EU-NATO cooperation.

Drawing on both the NATO SPS and work from the European Centre of Excellence for Countering Hybrid Threats (Hybrid CoE) in Helsinki and Civil-Military Cooperation Centre of Excellence (CCOE) in The Hague, NATO should work as a forum for identifying and understanding security risks and threats that fall below the Article 5 threshold but have significant security implications for NATO members both in and related to the Arctic. Particularly NATO members' activities in the North, including by the US Navy and Air Force, have led to extensive oceanographic and meteorological monitoring and expertise in the region, which in collaboration with academic and NGO experts can help understand human and ecological security impacts, for instance in Greenland. NATO SPS programme should

2.5 Emerging Theatres: The Arctic

expand exchanges of science and policy and develop foundations for further cooperation involving NATO Partner countries.



2.5: Environment and Security in the Arctic. [Click here to download the PDF version of the map.](#)

RECOMMENDATIONS

1. Increase NATO Science for Peace and Security (SPS) and related programs focused on Arctic domain awareness, environmental security, and hybrid/grey zone threats.
2. Initiate events and trainings focused on Arctic domain awareness, environmental security, and hybrid/grey zone threats using the SPS Programme and other appropriate NATO tools.
3. Integrate concepts of Arctic resilience and climate security into NATO and members' strategic planning processes.
4. Emphasize the importance of Intelligence, Surveillance, and Reconnaissance (ISR) and Search and Rescue (SAR) capacities for Arctic theatre operations and emergency assistance, including military-civilian cooperation in rapid response also for environmental concerns (e.g. oil spills).
5. Make the Arctic a case for EU-NATO cooperation endeavours, especially in identifying and planning for grey zone, unconventional or even hybrid threats that stem inter alia from environmental shifts and their security implications in the region.
6. Upgrade of a network of sensors to observe and measure the changes in the Arctic icesheet, building on the successful international cooperation in the MOSAIC expedition of the Polarstern research vessel in 2019-2020.
7. Examine the military dump site(s) under the melting permafrost in Greenland in view of preventing environmental harm.
8. Update parliamentarians on Arctic issues by using, for example, the NATO Parliamentary Assembly as a platform
9. Using the Arctic as a theme for NATO to engage with China (also in view of sharing information and pooling capacities for SAR and emergency response).

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2.6

Emerging Theatres: The Mediterranean

By R. Andreas Kraemer and Olivia Lazard with Alessandro Secchi



2.6: Satellite image of the Mediterraneanan.

The Mediterranean Basin is experiencing rapid warming as a result of climate change. Overfishing and pollution destroy the marine life and gradually cause ecological disintegration, thereby compounding the effects of warming. Onshore, the Mediterranean basin is also the locus of incremental yet aggravating environmental changes: landscapes have progressively eroded and dried up as a result of poor landscape management in various countries. Droughts, fires, and flooding events are becoming increasingly common. This is both an indication that the Basin is extremely vulnerable to climate change, and that the ecological disintegration of the basin contributes itself to climate deregulation.

The results of this disintegration onshore and offshore are varied. A direct consequence lies in the increasing difficulty of many to sustain nature-related livelihoods in the Basin. Fishing stocks are decreasing in quantity and quality. Dried up landscapes are pushing people out of traditional agricultural livelihoods, thereby increasing structural food insecurity and food inequalities in key countries of the Basin that uphold fragile governance patterns. In some countries, the switch to intensive farming strongly correlates with ever-increasing ecological disintegration and depletion of water tables, creating vicious cycles and contributing to droughts. Knock-on effects include a growingly fragile economic base, booming informal and illicit economies, conflicts over natural resources, and an exponential reliance on hydrocarbons for economic gains.

The structural deficiencies in governance, economic stability and ecological integrity have led in the past decade to structural security threats, including socio-political tensions culminating in the Arab Spring and its aftermath: full-blown wars (Libya), instrumentalization of socio-economic marginalization by terrorist and violent extremist groups (including ISIS, Al-Qaeda and others), economic predation of human and economic vulnerability including in the form of human and migration trafficking.

Finally, these various intertwining threads of structural and dynamic vulnerability have created a space for power competition. The Mediterranean basin is now a geopoliticised space in which countries such as Russia, Turkey and EU members compete, finding decreasing space for cooperation. Latest development threatening the Mediterranean basin with security and environmental risks relate to the energy competition and marine disputes involving some NATO members.

Various intertwining threads of structural and dynamic vulnerability have created a space for power competition. The Mediterranean basin is now a geopoliticised space in which countries such as Russia, Turkey and EU members compete, finding decreasing space for cooperation. Latest development threatening the Mediterranean basin with security and environmental risks relate to the energy competition and marine disputes involving some NATO members.

Countries in the Basin, the EU and the UN Environment Programme have long invested in developing institutions for improving integrated governance in the region (e.g. the Barcelona Convention and its protocols on environment and pollution control; the UNEP Mediterranean Action Plan and the Mediterranean Commission on Sustainable Development; the Union for the Mediterranean promoting stability and integration throughout the region, or the Euro-Mediterranean Parliamentary Assembly). Individually and collectively, these institutions and programmes remain weak, however, and the governance-building process has slowed over the last decade.

Efforts to improve governance and policy outcomes are now underway with the MED2050 Foresight exercise under the Barcelona Convention, with results expected towards the end of 2022. In the process, the scope of the Barcelona Convention is likely to be broadened, not in formal but in practical terms, as environmental diplomacy is becoming ever more relevant for other policy areas, including security. These include a new look at the geopolitics of the Mediterranean with new "entrants" (states like China, public and private "non-state" actors, etc.), the specific approach to implementing the UN Convention on the Law of the Sea in the Mediterranean, governance in normal as well as in crisis situations, and anticipating and building (collective) resilience to major risks. Some issues, such as maritime surveillance or port security are of direct relevance to NATO. As this foresight exercise progresses, it will build a regional network of experts and policy makers that bridges the "security" and "civilian" policy communities, which NATO should support and engage with.

RECOMMENDATIONS

1. Use the Mediterranean basin as a case study to review and improve NATO's analytical and intelligence systems for security monitoring. The convergence of human insecurity, socio-economic and institutional fragility, energy disputes, climate and environment-related risks driving ecological disintegration provide the perfect sandbox for a new type of analytics systems.
2. Examine how ecological considerations can contribute to NATO's active approach to deconfliction in the Mediterranean. Current energy and territorial disputes involving NATO members solely focus on narrow economic and geopolitical gains at the expense of systemic threat analysis. NATO should undertake research on foresight and scenario developments that enable NATO members to conceptualize the Mediterranean basin through more holistic security dimensions, and therefore enable a different approach to deconfliction in the Mediterranean. The aim should be to pave the way for long-term cooperation for the protection and systemic regeneration of the Med-basin.
3. Build upon NATO's Mediterranean dialogue. Deepen partnerships with relevant institutions such as the EU, the Union for the Mediterranean (UfM), the African Union (AU) for collective and shared analysis on environment-, climate- and human-security threats.
4. Specifically, make the Mediterranean a case for reinforced EU-NATO cooperation, linking with the European Neighbourhood Policy.
5. Create a Mediterranean-based cooperation with partners countries and NATO members to initiate environmental cooperation aimed towards the systemic security of the Mediterranean.
6. Consider engaging into active marine regeneration in the Mediterranean basin so as to reinforce the ecological resilience of the Basin and address root causes of insecurity.
7. Increase NATO Science for Peace and Security (SPS) and related programs focused on Mediterranean domain awareness, environmental security, and hybrid/grey zone threats.
8. Initiate events and trainings focused on Mediterranean domain awareness, environmental security, and hybrid/grey zone threats using the SPS Programme and other appropriate NATO tools.
9. Integrate concepts of Mediterranean resilience and climate security into NATO and members' strategic planning processes.
10. Update parliamentarians on Mediterranean issues by using, for example, the NATO Parliamentary Assembly as a platform.
11. NATO should engage with the MED2050 foresight exercise under the Barcelona Convention.

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2.7

Enhancing Education and Training

By Wendell Christopher King with Chad Briggs, David Burbridge, and Dominique Noome



12.7: The NATO Military Environmental Protection, Practices and Procedures Course (NMEPPPC) aims to familiarize the student with the knowledge and skills to integrate NATO Environmental Protection (EP) requirements during NATO-led military operations in accordance with NATO STANAGs and policies.

The overarching impact of climate change on the security environment is an accentuation of a large and growing number of the world population to satisfy their basic human needs: food, shelter, clean water, and human safety provided in a sustainable way. Food and water resources are already being damaged by climate change and this is predicted to get much worse. Disease enhanced by warming, resistance and the spread of vectors, damage to infrastructure from more intense natural disasters, flooding and storm surges compounded by sea level rise are further examples of how climate change threatens more and more people.

The consequences of climate change have clear significance for NATO and its ability to accomplish its three core tasks of collective defence, crisis management, and cooperative security. NATO's 2010 Strategic Concept states that climate change is amongst the drivers that will shape the Alliance's future security environment and it will "have the potential to significantly affect NATO planning and operations."¹

¹ NATO, *Active Engagement, Modern Defence: Strategic Concept for the Defence and Security of the Members of the North Atlantic Treaty Organization* (Adopted by Heads of State and Government at the NATO Summit in Lisbon, 19-20 November 2010), para 15, p 13. https://www.nato.int/cps/en/natohq/topics_82705.htm

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Today, the uniqueness of the scope and magnitude of the new challenges posed by climate change make education and training even more important, particularly since most military members will not have been fully prepared for these missions in their home countries.

However, NATO lacks a programme of education and training which specifically addresses the emerging risks/threats of climate change, climate change adaptation planning and the mitigation needed to reduce the effects of climate change.²

Finally in justifying this proposal, it should be recognised that offering climate change education and training creates a special opportunity for building cooperation and trust across the political landscape of NATO. Climate change is a world-scale threat that respects no political or geographic bounds. Members from all NATO nations (and others from the region) can learn together how to respond to climate change for the benefit for all.

NATO lacks a programme of education and training which specifically addresses the emerging risks/threats of climate change, climate change adaptation planning and the mitigation needed to reduce the effects of climate change. ... Offering climate change education and training creates a special opportunity for building cooperation and trust across the political landscape of NATO.

² The authors recognise that existing educational opportunities include courses at the NATO School Oberammergau (NSO) on energy security and environmental management including a two-week course called Environmental Management for Military Forces. The NATO Military Engineering Centre of Excellence (MILENG COE) has a one-week course called the NATO Military Environmental Protection Practices and Procedures Course (NMEPPPC). The NATO School course is focused more on the operational level while the MILENG COE course is focused primarily on the tactical level. Also, NATO has provided briefings in the European Defence & Security College course on climate change. Our recommendations below offer suggestions for more specifically focused education and training on climate change mitigation and adaptation.

RECOMMENDATIONS

1. NATO should integrate a climate change curriculum into existing education programmes as appropriate, plus create new courses based on gaps identified in an educational needs-analysis of the climate change threats.
2. The programme should include: Developing a comprehensive education programme that includes integrating climate change curriculum into existing courses and programmes, and developing new courses needed to achieve the overall education programme goals.

Specifically:

3. A basic course on climate change for the military and civilian defence practitioner to understand the threats and risks posed by climate change and the principles and adaptation and mitigation which will be needed in future missions.
4. A seminar on climate change implications to defence and security that aims to influence perceptions of senior military leaders. The seminar would seek to persuade senior military leaders to initiate or support the reforms necessary for their national forces to prepare for these challenges and to support the implementation of the mitigation measures necessary to reduce the effects of climate change.
5. Courses and workshops in strategic analysis of the climate change impacts on national or regional security. The target audience would be strategic planners, policy staff, and emerging leaders at the intermediate level.
6. One course that we see as a later priority is one that is internal to the military departments and would look at how to assess the impacts of climate change on military operations. This would include addressing how climate change impacts operational capacity, the new missions needed to respond to climate change, force reshaping to meet these new priorities, and how militaries can, through operational adjustments, contribute to mitigating climate change within defence forces.
7. Since each country and region is impacted differently by climate change, the NCWES recommends tailored courses to meet the specific needs for strategic analysis and operational planning of different geographic areas of NATO operational area or other areas of NATO critical interest.
8. Add training activities and war gaming as part of environmental security curricula. Wargame scenarios can be modified to include environmental layers without shifting the primary educational or analytical focus of the game.
9. Develop and implement standard operating procedures for HADR operations that ensure clear coordination with civilian partners and other multilateral organisations such as EU or UN.
10. Establish a NATO Centre of Excellence (COE) on Climate Change and Security.
11. Develop practical guidelines for making allied armed forces 'climate proof'-analyse and consider impacts on infrastructure, communication, training, equipment, etc.

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2.8

Treaty Amendment

By Rita Floyd with Stavros Pantazopoulos



2.8: NATO Headquarters Brussels.

Among NATO officials and within individual member states it is widely accepted that security threats no longer pertain exclusively to armed attack/conflict. Still, NATO's definitive Article 5 that specifies the all-important mutual defence obligation, applies in response to armed attack only. Concretely this means that in many cases when allies encounter security threats, they are not guaranteed assistance from their allies. Not even in cases where the threat is far greater than that posed by the terror attacks of 9/11 – historically, the only time Article 5 has been invoked.

With many threats no longer tantamount to armed attack and given further that armed response does not constitute a credible or sound defence against many unconventional threats it is time to consider extending Article 5.

Moreover, while Article 5 is not officially limited to an armed response; it is generally taken to mean armed response. With regards to the many unconventional security threats (including pandemics, irregular migration, climate induced natural disasters) this is not helpful, because these threats cannot be solved by armed force. Furthermore, a conventional armed response is unlikely to be the best option in the 4th and 5th operational domains of cyber and space, respectively.

The debate about NATO 2030 and the call for a more political and less militaristic alliance is an opportunity to make Article 5, and hence the alliance, fit for the challenges of our time, without reneging on the important commitment contained in NATO's original treaty.

RECOMMENDATION

Article 5 is the cornerstone of NATO. With many threats no longer tantamount to armed attack and given further that armed response does not constitute a credible or sound defence against many unconventional threats it is time to consider extending Article 5. An extension of Article 5 must consist of: 1) a new threshold determining what, in addition to armed attack, triggers Article 5 obligations; and 2) a prescription regarding the nature of the response. In light of this it is proposed that the existing Article 5 of the Washington Treaty should be extended as follows:

The Parties further agree that a sufficiently harmful objective existential threat to one or more of them in Europe or North America shall be considered a threat to them all and consequently they agree that, if such a threat manifests, each of them will assist the Party or Parties so threatened. Should ordinary political measures fail to alleviate the threat, the Parties will by taking forthwith, individually and in concert with the other Parties, defensive securitizing action, including assistance with domestic security measures and sanctions to restore and maintain the security of the North Atlantic area.

This amendment is in line with Secretary General Stoltenberg's vision for NATO 2030 outlined in June 2020. He emphasises both a broader view of security and a multitude of ways (he speaks of a 'broad range of tools') to combat insecurity, including 'Military and non-military' and 'Economic and diplomatic' tools (Stoltenberg, 2020).

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2.9

Commitment to Environmental Standards and Audits

By Linsey Cottrell, Stavros Pantazopoulos and Doug Weir with David Burbridge

International concern over the triple crises of climate change, biodiversity loss and pollution is increasing pressure on all societal stakeholders to minimise environmentally harmful behaviours. The security and defence sphere is not immune to these pressures, as evidenced by the growing scrutiny over military emissions, and the ongoing progressive development and strengthening of the legal framework protecting the environment in relation to armed conflicts.¹

NATO faces a choice in how it responds to this changing environment, and the constraints that it will place on the operational activities of its members. NATO and its members could pursue a policy of implementing the minimum steps necessary to meet their legal obligations for environmental performance. However, as NATO has already recognised that environmental degradation is, in itself, a security threat and, with the risk that without performance improvements, increasing political attention on the environment may reduce the military's operating space, business as usual poses reputational and operational risks.

Another route is available, and that is for NATO to demonstrate leadership in reducing the environmental impact of its activities, and those of its members, both in peacetime and in the context of its operations. NATO is well placed to do this, having recognised the importance of environmental protection since 1969.² Through working groups, projects, doctrine and policy development, NATO has addressed both environmental protection, and environmental security, and could now expand this work further.

A wide-ranging, independent, and transparent audit would help bring into relief the environmental performance and policy compliance of NATO's members, identify best practice and areas for improvement, as well as any existing barriers to implementation or questions of consistency between nations.

However, before doing so, it is vital that NATO first reviews the impact of its existing strategy to protect the environment to date, and the extent to which its members have adopted and implemented related policies. A wide-ranging, independent, and transparent audit would help bring into relief the environmental performance and policy compliance of NATO's members, identify best practice and areas for improvement, as well as any existing barriers to implementation or questions of consistency between nations. It could also showcase examples of good practice and provide the baseline data

¹ "Guidelines on the Protection of the Natural Environment in Armed Conflict," *ICRC*, 25 September 2020. www.icrc.org/en/document/guidelines-protection-natural-environment-armed-conflict-rules-and-recommendations-relating and UN International Law Commission, "Protection of the environment in relation to armed conflicts: Text and titles of the draft principles provisionally adopted by the Drafting Committee on first reading," *United Nations General Assembly*, 6 June 2019. <https://undocs.org/pdf?symbol=en/A/CN.4/L.937>

² "Environment – NATO's stake," NATO, last updated: 09 Oct. 2020. https://www.nato.int/cps/en/natohq/topics_91048.htm

necessary to inform a comprehensive and long-term effort to improve the environmental performance of the organisation and its members.

NATO has developed five Environmental Protection Standardization Agreements (STANAGs) – plus one standards-related document” (SRD) - that focus on protecting the environment during NATO-led military operations;³ their impact could certainly be reviewed.⁴



2.9: The Alliance first recognised the natural environmental challenges facing the international community in 1969, when it established the Committee on the Challenges of Modern Society (CCMS). Until its merger with the NATO Science for Peace and Security (SPS) Programme in 2006, the CCMS provided a unique forum for NATO and its partner countries to share knowledge and experience on social, health and environmental matters, both in the civilian and military sectors.

Similarly, NATO policy is to respect the environmental laws of a host nation, but it does not require compliance with environmental laws if there is a military necessity⁵ to not do so. As it is important that military necessity is not used to justify inadequate environmental protection measures, the effectiveness of this policy could also be assessed.

There are reasons to be concerned about the gap between NATO policies and practice. For example, a review of NATO environmental performance in Afghanistan identified a lack of dedicated capacity and unclear responsibilities;⁶ while in Montenegro the development of a NATO-backed training area in the Tara River Biosphere Reserve has led to accusations of cultural and ecological vandalism.⁷ In 2019, NATO's own Legal Gazette highlighted the need for the regular review and update of environmental protection procedures,

and identified staff under-manning in environmental protection which 'inhibit the inclusion of EP [environmental protection] in important initiatives and activities across NATO'.⁸

By its own admission, NATO accepts its responsibility to protect the physical and natural environments where operations and training take place, NATO also acknowledges that security is a confluence of political, economic, social, and environmental factors. Policymakers and the public in NATO member states must be confident that NATO's policy and practice reflects these positions.

³ STANAGs are available through the NATO Standardization Office at <https://nso.nato.int/nso/nsdd/listpromulg.html>. To access those standards published within the Allied Joint Environmental Protection Publication (AJEPP) series, search by "AJEPP".

⁴ David J. Burbridge, "Environmental Protection: NATO Policies and National Views", *NATO Legal Gazette*, Issue 40, (November 2019): p40. http://www.act.nato.int/application/files/5515/7428/7917/legal_gazette_40.pdf

⁵ Ibid, pp25-26

⁶ Stephanie San Miguel, "Mission accomplished? An evaluation of the North Atlantic Treaty Organization's (NATO) Environmental Protection Policies for NATO operations in Afghanistan", *University of Guelph*, 2016. <https://atrium.lib.uoguelph.ca/xmlui/handle/10214/16209>

⁷ John C. Cannon, "Protesters hold back military takeover of Balkans' largest mountain pasture", *Mongabay*, 18 January 2021. <https://news.mongabay.com/2021/01/protesters-hold-back-military-takeover-of-balkans-largest-mountain-pasture/>

⁸ David J. Burbridge, "Environmental Protection: NATO Policies and National Views," *NATO Legal Gazette*, Issue 40, (November 2019): p39. http://www.act.nato.int/application/files/5515/7428/7917/legal_gazette_40.pdf

RECOMMENDATIONS

1. NATO should conduct a wide-ranging, independent, and transparent audit of the environmental performance of both itself and its members to review the effectiveness of its environmental protection and security policies. The audit should be undertaken by an external and independent entity and made publicly available.
2. NATO should increase its staff resourcing to ensure that environmental protection measures and policy can be properly implemented.
3. NATO should encourage its members to adopt and implement the ICRC's updated Guidelines on the Protection of the Natural Environment in Armed Conflict.

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2.10

Addressing Environmental Consequences in Armed Conflict

By Marco Grandi, Wilbert van der Zeijden and Wim Zwijnenburg

Recent wars and armed conflicts have demonstrated the acute and long-term environmental impacts of specific targeting decisions that pose health risks to civilian lives and livelihoods. A growing body of research from conflict-affected areas is helping to understand the environmental consequences of specific targeting aimed at critical civilian infrastructure, industrial facilities, and toxic remnants of war. All of these have detrimental health impacts on communities and on human, economic and environmental security more generally. Wider ‘environmental situational awareness’ and environmental risk assessment should drive a review of military planning, as well as target selection and development, thus improving the Protection of Civilians (PoC) and environmental security.

Wider ‘environmental situational awareness’ and environmental risk assessment should drive a review of military planning, as well as target selection and development, thus improving the Protection of Civilians (PoC) and environmental security. ... NATO should now strive to better address the potential impact of the targeting process on the environment and its impact on the protection of civilians.

The ICRC Guidelines on the Protection of the Natural Environment in Armed Conflict, as well as NATO’s own Policy of PoC (specifically, NATO’s Preparing to Protect: Advice on implementing NATO’s Protection of Civilian Policy - 2018) both highlight the urgency of a review of the current Alliance targeting processes. NATO should now strive to better address the potential impact of the targeting process on the environment and its impact on the protection of civilians. The need for this revision is consistent with the NATO PoC framework, particularly with regards to mitigating harm from its own actions and to ensure the provision of a safe and secure environment, as approved by the Alliance’s Member States.

In addition, information collected in the targeting process as well as other data on environmental impacts of military activities should be, when possible, shared with relevant actors. These should include humanitarian organisations and local authorities. Military planners often have a wealth of data on geological conditions, industrial and civilian infrastructure, and other relevant environmental conditions. This information is essential for first responders and post-conflict assessments. Following cessation of military operations, NATO should commit to share this data, as it can improve humanitarian responses, and assist rapid post-conflict impact assessment thereby supporting clean-up, remediation, and restoration efforts.

There is a specific need to update SHAPE’s “The Protection of Civilians Allied Command Operations Handbook”. This revision would be consistent with the NATO PoC framework, particularly with regards to mitigating harm from its own actions and to ensure the provision of a safe and secure environment, as approved by the Alliance’s Member States.



Better analysis and impact assessment of environmental damage, both from military activities and operations are a step forward in preventing and minimizing their environmental 'footprint'. Stepping up efforts to improve these policies are warranted, both for direct prevention of civilian and environmental harm and reduces long-term environmental security challenges in conflict-affected areas.

These combined efforts will support a safer and more secure environment. NATO addressing environmental protection within the targeting cycle and sharing information with civilian counterparts on its environmental dimensions and consequences of its operations would set a new standard. Based upon this standard, NATO could engage with its partners in raising awareness on wider environmental dimensions of armed conflict and military operations.

2.10: NATO recognises that it faces many environmental challenges. In particular, the Alliance is working to reduce the environmental effects of military activities and to respond to security challenges emanating from the environment.

RECOMMENDATIONS

1. Engage in stakeholder discussion with relevant groups, including civil society groups, legal experts' representatives from the ICRC and humanitarian organisations on the targeting cycle.
2. Improve understanding of second and third order effects of operations.
3. Contribute to preventing, minimizing, or mitigating environmental health risks and wider environmental damage.
4. Contribute to an enhanced data collection, data analysis and data sharing about the area of operation and consequences of military operations.
5. Review options to share information on environmental situational awareness with relevant stakeholders: either humanitarian organisations and/or local authorities, which can facilitate rapid analysis of environmental damage, expedite the identification of potential risks, as well as support clean-up and remediation efforts in post-conflict programmes.
6. Update SHAPE's "The Protection of Civilians Allied Command Operations Handbook" to include more specific attention to climate change and to environmental impacts of operations.

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2.11

Commitment to Clean Energy Transition and Energy Audits

By Olivia Lazard and Megan Richards with David Burbridge, Linsey Cottrell and Larry Moffett



2.11.a: The Virginia National Guard conducts a formal ceremony Oct. 14, 2014, to break ground on the new solar array that will provide power and energy security to the 183rd Regiment, Regional Training Institute at Fort Pickett, Va.

Energy is essential to the operation of every economy and society and is an important factor in determining costs of industrial production and consumer goods. World energy demand from industry, transportation, commerce, and residences is expected to increase by nearly 50% by 2050, with the bulk of that growth in non-OECD countries. Where that energy comes from, what it costs, and its impact on global greenhouse gas (GHG) emissions will have significant impacts on international security.

The armed forces are large consumers of energy and typically the largest energy consumers among other government agencies. For example, in the United Kingdom, GHG data published by the Ministry of Defence for 2017-2018 (including fuel use from the operation of military equipment such as aircraft, navy vessels and land vehicles) was three times higher than the total GHG emissions reported for all remaining government departments. This excludes emissions from military equipment procurement or supply chain.

Data on global military GHG emissions is limited. Under the UN Framework Convention on Climate Change (UNFCCC), signatories are obliged to publish annual GHG emissions, but reporting separate military emissions is voluntary and often not included. GHG emissions in 2018 for the United States Department of Defense have been estimated at 56 million tCO₂e.^{1,2} In comparison to the GHG emissions for whole countries, this exceeds the annual emissions for countries such as Denmark or Sweden.³

The estimated 56 million tCO₂e for the US armed forces also compares with 8 million tCO₂e for the EU-27 armed forces,⁴ and 3 million tCO₂e for the United Kingdom armed forces. All these figures are under-estimates since none include Scope 3 emissions,⁵ i.e. through equipment procurement and the supply chain, or emissions related to the impacts of conflict-operations. Incorporating Scope 3 emissions, conservative estimates for the military carbon footprint of the EU-27 and the United Kingdom have been given at 25 million tCO₂e and 11 million tCO₂e, respectively but are likely to be higher due to data gaps.^{4,6} There is no comparable carbon footprint estimate for the US armed forces using similar methodology and most recent published targeted Scope 3 estimates by the US Department of Energy for 2016 excludes emissions from the procurement of equipment and services.⁷ Based on the carbon footprint estimates for the EU-27 and the UK which highlighted the high contribution from Scope 3 emissions, the annual carbon footprint for the US armed forces which incorporates Scope 3 emissions aligned with for the GHG protocol, would exceed 175 million tCO₂e and likely to be significantly higher.

If the main sources of energy for a country are imported, dependent on a single supplier (particularly for a single type of essential fuel), and there are no easily accessible alternatives at reasonable cost, then tensions and conflicts can arise (domestically, internationally, or both) if and when the source stops or limits supply or raises prices significantly.

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Energy systems use critical infrastructures - be it physical or digital - which can be subject to security threats (physical or cyber) and in increasingly interconnected energy systems within and between

¹ tonnes of carbon dioxide equivalent

² Crawford (2019)

³ Retrieved from Table 2.3 of European Environment Agency report - Annual European Union greenhouse gas inventory 1990–2018 and inventory report 2020. <https://www.eea.europa.eu/publications/european-union-greenhouse-gas-inventory-2020>

⁴ Parkinson and Cottrell (2021)

⁵ There are three groups of GHG emissions under the Greenhouse Gas Protocol. Scope 1 (direct fuel consumption), Scope 2 (purchased electricity, heat and steam) and Scope 3 (all other indirect emissions from the organisation's value chain)

⁶ Parkinson (2020)

⁷ U.S. Department of Energy, *Scope 3 emissions from federal government agencies, Comprehensive Annual Energy Data and Sustainability Performance*. 2016. <https://ctsedweb.ee.doe.gov/Annual/2016/Report/Scope3GHGEmissionsSubjectToReductionTargetsByCategoryComparedToFY2008.aspx>

countries and regions, the potential for creating significant damage to an economy and society is increased.

Better and greater use of clean, efficient, available alternative sources of energy will help to reduce GHG emissions, can help to improve energy security, (by greater domestic production or expanded trading with producers of cleaner sources) improve the health and welfare of citizens by addressing climate change and thus help to reduce potential conflicts over access to water, arable land, clean air, or economic development. Increasing the efficiency of energy use reduces its consumption thus relieving pressures on access to energy, its costs, GHG emissions and pollution.

Currently, energy extraction and much of its consumption is a key driver of both climate change and environmental degradation. The release of fossil fuels (carbon dioxide and methane) is driving human societies, institutions, companies, and organisations to shift energy systems and urgently decarbonise. NATO must play its part in this and commit to its own decarbonisation. It has already started. But there are steps missing in its decarbonisation process that should be urgently implemented to guide a cross-institutional decarbonisation process. Moreover, the decarbonisation process is not fully sufficient. Energy consumption from sources other than fossil fuels can still wreak havoc on the environment if environmental standards in supply chains are not enforced, and if demand drives suppliers into unreasonable levels of exploitation.

There is a particular risk stemming from our transition to more renewable sources of energy, particularly with regards to photovoltaics and other renewables. Many of the materials (rare earth metals and associated materials) needed for a clean transition are for the most part located in China – which has leveraged its access to raw materials into a vertical supply chain essential for its power projection.

The clean energy transition is not a silver bullet to address environmental degradation and climate change, although it is a necessary and important step. Demand rationalisation, research in re-usability, efficiency, and recyclability, as well as exploring new and innovative types of clean energy are key to ensuring that NATO Members, like others, head in the right direction for a transition to more sustainable energy and mobility.

Other sources of materials are scattered around Latin America, Africa, Central Asia, Australia, and the deep seas. A lot of the known and mapped resources are located in underground parts of the terrestrial and marine ecosystems that we need to protect and regenerate in order to re-regulate the global climate regime over time. Exponential demands for these materials will lead to competition for access to them and, if not managed carefully and collectively, could lead to the plundering of vast ecosystems that help to regulate the climate negatively affecting the biodiversity of species that are essential for the continuation of life on earth.

The clean energy transition is not a silver bullet to address environmental degradation and climate change, although it is a necessary and important step. Demand rationalisation, research in re-usability, efficiency, and recyclability, as well as exploring new and innovative types of clean energy are key to ensuring that NATO Members, like others, head in the right direction for a transition to more sustainable energy and mobility.

RECOMMENDATIONS

1. NATO should improve energy efficiency and diversify sustainable energy sources (for example hydrogen). NATO should strive to reduce its carbon and hydrological footprint by all means possible at headquarters, training sites and at field levels. NATO should also urge all Allies not to exempt their military from energy efficiency goals.
2. NATO should engage in technological research for energy efficiency and GHG reductions.
3. To the extent possible countries should aim to diversify their sources of energy supply by producing more domestically (and with the dramatic lowering of costs of renewable energy sources like solar and wind this is becoming a more realistic source - in part at least), looking to other sources and means of providing energy, developing regional interconnections and associations for energy trade, while aiming to decrease GHG emissions.
4. NATO should continue to monitor and address the energy security concerns and conditions of its Member States and keep a watching brief on energy developments around the world with a view to identifying potential conflict zones internationally.
5. NATO should continue to survey potential threats to critical energy infrastructure and encourage adequate protection of both physical and cyber control of those infrastructures.
6. New technical solutions to protecting those infrastructures should be developed and best practices exchanged both nationally, regionally, and internationally.
7. NATO should commit to energy audits, transparent carbon reporting and the setting of carbon reduction targets. This should not just cover scope 1 and scope 2 GHG emissions but also include scope 3 consumption-based emissions based on GHG protocol.
8. All reporting should be externally audited and independently verified.
9. NATO already has a range of initiatives in place to support the move to lower carbon energy use. NATO adopted the Green Defence Framework back in 2014 but there is no reporting of GHG emissions or guidance on GHG reporting mechanisms.
10. NATO already has a range of initiatives in place to support the move to lower carbon energy use. NATO adopted the Green Defence Framework back in 2014 but there is no reporting of GHG emissions or guidance on GHG reporting mechanisms.
11. Energy efficiency in military procurement is also required. For member states which are also in the EU and regulated under the Energy Efficiency Directive 2012/27/EU, there military exemptions for certain buildings owned by the armed forces and energy performance criteria do not apply to contracts for the supply of military equipment. A review on how widely these exemptions is being applied for EU member states would be useful.

RECOMMENDATIONS - Continued

12. Policies for the low carbon procurement of military equipment, other goods, and services, should be put in place with contractual obligations to ensure that suppliers are reporting their GHG emissions and hydrological footprint and implementing measures to markedly reduce them.
13. Militaries typically own large areas of land and EU armed forces are the largest landowner in Europe. All NATO member states should also regenerate military-owned land to improve carbon sequestration and biodiversity, as well as using land to generate on-site renewable energy where appropriate.

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2.11.b: NATO tests smart energy technologies at Exercise Capable Logistician 2019.

2.12

Smart Energy: Less Fuel, More Power

By Susanne Michaelis

The dependence on fuel is a costly security risk for our military forces, as fuel has to be transported to the theatre, often through dangerous terrain. Oil spills and burning of diesel, be it accidental or deliberate, have harmed lives and led to ecological disasters and political tensions. Furthermore, conducting and securing fuel transports impose an extra burden on the forces.

Various projects have demonstrated that fuel savings – implemented with expertise – improves the security and life quality of soldiers, while reducing CO₂ emission and the environmental impact at large. Based on these findings, several nations have already developed strategies and implementation plans aiming to reduce the fuel consumption and increase the operational effectiveness of their forces.

Various projects have demonstrated that fuel savings – implemented with expertise – improves the security and life quality of soldiers, while reducing CO₂ emission and the environmental impact at large. Based on these findings, several nations have already developed strategies and implementation plans aiming to reduce the fuel consumption and increase the operational effectiveness of their forces.

With the aim to raise awareness of successful energy solutions, share information and compare results, NATO created the “Smart Energy” initiative, bringing together a large expert community during multinational events, projects, and exercises. It soon became apparent that aircrafts, ships, and land vehicles are being targeted by the defence industry for increased combat power and energy efficiency. Hence, NATO saw more added value to shift the focus of Smart Energy on military camps, which are mostly run in an extremely inefficient manner in all military services.

Several nations have conducted research projects demonstrating the usefulness of innovative camp energy equipment & management for fuel savings, while at the same time reducing noise, pollution, maintenance & repair of generators.¹ But all these projects have been implemented as closed systems, meaning the equipment is not interoperable and the data sets are not comparable.

As a solution, NATO HQ started the Smart Defence project² “Smart Energy Training and Assessment Camps (SETAC)”³ bringing together national experts and their equipment for multinational testing, improvement of interoperability and standardization of energy monitoring.

¹ The NATO-hosted Website www.natolibguides.info/smartenergy provides examples under “News”, “Articles” and “Reports”.

² Smart Defence is a cooperative way of thinking about generating the modern defence capabilities that the Alliance needs for the future. See www.nato.int/cps/en/natohq/topics_84268.htm

³ More information on SETAC testing in military exercises can be found at the NATO-hosted Website www.natolibguides.info/smartenergy under “Exercises”.

A milestone of SETAC was the set-up of a multinational Smart Energy camp in the exercise Capable Logistician 2019 (CL19) as one of twelve logistic units.⁴ The Smart Energy experts involved succeeded to build a functional multinational microgrid with an energy management system, combining diesel generators with renewable energy and energy storage, and resulting at a fuel reduction of 80-100% compared to conventional camps (depending on the climatic environment).



2.12: NATO tests smart energy technologies at Exercise Capable Logistician 2019.

Furthermore, standard energy monitoring & audits performed under the NATO Science for Peace and Security (SPS) project “Camp Energy”⁵ at other logistic CL19 units calculated fuel savings of up to 60%, simply by rearranging existing diesel generators. Recommendations based on the audits and the data sets helped the commanders to respond effectively to diesel delays, flooding, oil spills, fires, and generator failures.

The results of CL19 are documented in the Final Exercise Report (CL19 FER) distributed to NATO member states and partner countries at the end of 2019. The observations and recommendations of this FER should help NATO to systematically improve policies, doctrines, and standards regarding logistic-related interoperability, including aspects of Environmental Protection and Smart Energy.

The successes of the NATO Smart Energy initiative convinced NATO Heads of States and Government to declare at the Brussels Summit in July 2018 “we will also further improve the energy efficiency of our military forces, including through the use of sustainable energy sources, when appropriate”, thus reinforcing the declarations of Chicago (2012), Wales (2014) and Warsaw (2016).

⁴ A detailed story on the Smart Energy activities in CL19 can be found in the journal “European Affairs”. See: Bittante, Elena, “NATO Smart Energy Capable Logistician 2019: the Italian Air Force at the forefront” European Affairs, 10 August 2019.

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⁵ “New NATO scientific project to reduce energy consumption of deployable camps”. NATO, 2 October 2018, https://www.nato.int/cps/en/natohq/news_158964.htm

As a next step, the North Atlantic Council agreed in November 2019 on a “Way Forward” for Smart Energy by establishing common standards, diversifying energy supplies, in line with needs and conditions, using sustainable energy sources and integrating energy efficient components into exercises.

However, the implementation of these political declarations and commitments are clearly in need of further support by NATO HQ, SHAPE and Smart Energy subject matter experts, especially with the view on developing common standards for energy-related education, training, planning, audits, and procurement to ensure best results in fuel savings and interoperability.

The challenge for the next 10 years will be to encourage the nations to implement their declarations and commitments, make them agree on doctrines and standards, and ensure that these will be implemented, not only on the level of NATO missions and NATO-owned capabilities, but also on national levels.

RECOMMENDATIONS

1. **Develop Smart Energy as a NATO capability and define it as a Minimum Capability Requirement.**
2. **Build a standing multinational “Smart Energy Training and Assessment Camp (SETAC)” where new equipment and processes can be tested for functional and interoperable criteria.**
3. **Draft a NATO policy/doctrine on Smart Energy to ensure that results and recommendations will be effectively implemented throughout NATO forces.**
4. **Support NATO members and partner nations in charting their strategies and projects for fossil fuel and emission reductions with regards to their military and defence activities.**

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2.13

NATO and the Crisis in Resilience Investment

By Steven Herz



2.13: Aerial view of Beira, Mozambique after the impact from cyclone Idai, 3 May 2019.

Key Messages

- Many vulnerable countries urgently need more adaptation finance to cope with the mounting impacts of climate change.
- The U.S., EU, and UK have all recognized that these impacts threaten their security and have begun to integrate climate risks in their security strategies. This opens new opportunities to increase support for adaptation in vulnerable countries that can prevent security challenges from arising.
- NATO could be an important venue for increasing this support. To create incentives for members to raise spending on reducing climate-related security threats, members should agree to count resilience support under its burden sharing agreement.
- Members that will increase their annual security spending over the next four years to meet the 2 percent guideline should be encouraged to allocate new spending to strengthening resilience in vulnerable areas critical to NATO's collective security.
- The U.S., as the leading advocate of increased spending and the 2 percent guideline, should promote increased resilience spending by proposing that new and additional resilience spending be counted as a contribution to collective security.

The "Adaptation Gap"

Many countries, particularly the poorest, are extremely vulnerable to the mounting impacts of climate change, and the profound economic, social, and environmental dislocations those impacts will cause.

Many of these countries lack the resources to address these challenges.¹ According to UNEP, annual adaptation costs in developing countries are currently around \$70 billion and are expected to grow to \$140–300 billion in 2030.² Yet despite this evident need, support for climate resilience from developed countries amounted to only \$15 billion in 2018.³ Significant increases in adaptation finance are urgently needed to fill this “adaptation gap.”

Equally troubling, much of the international support for adaptation is not new money. It often comes from foreign assistance and development budgets, meaning that strengthened resilience may compete for funding with health, education, and other critical development needs.⁴

The Climate-Security Nexus

As climate change intensifies—devastating ecosystems, displacing tens of millions of people and imperiling the well-being of hundreds of millions more—impacts will spill across borders, posing wide-ranging challenges to other countries.

Recognizing the risks posed by these cascading impacts, UK Prime Minister Boris Johnson, as chair of the recent U.N. Security Council meeting on climate change, called climate change one of the “gravest threats to global peace and security.”⁵ President Biden and EU leaders have similarly recognized the security threats posed by climate disruptions outside their borders, and have taken initial steps to better integrate climate concerns into their security strategies.⁶

None of these leaders, however, have made concrete plans to strengthen their national security by helping vulnerable countries build resilience to climate-induced shocks before they spiral out of control.

NATO Burden Sharing

NATO could provide a critical platform for coordinating increased investments in resilience in vulnerable countries.

NATO allies are expected to fund their defense capabilities so that they can effectively contribute to the alliance’s collective security efforts. Over the years, U.S. presidents of both parties have objected that the U.S. bears too much of the overall costs and have pressed others to invest more in their capabilities. In 2014, NATO members agreed to “aim to move towards” spending at least 2 percent of

¹ Global Commission on Adaptation. “Adapt now: A global call for leadership on climate resilience”. 2019. <https://gca.org/about-us/the-global-commission-on-adaptation/>

² UNEP. “Adaptation Gap Report 2020”. 14 January 2021. <https://www.unep.org/resources/adaptation-gap-report-2020>

³ Oxfam. “Climate Finance Shadow Report: Assessing Progress towards the \$100 Billion Commitment”. 2020. <https://oxfam.app.box.com/s/djxmq18v80tkuac8xjwrpoch7bf7prjs/file/729355846954>

⁴ Oxfam (2020).

⁵ CNBC. “UN Security Council to discuss the ‘gravest threat’ to global peace and stability”. 23 February 2021. <https://www.cnbc.com/2021/02/23/climate-change-threatens-global-peace-un-security-council.html>

⁶ The White House. “Executive Order on Tackling the Climate Crisis at Home and Abroad”. 27 January 2021. <https://www.whitehouse.gov/briefing-room/presidential-actions/2021/01/27/executive-order-on-tackling-the-climate-crisis-at-home-and-abroad/>; The White House. “The Presidential Memorandum of September 21, 2016 (Climate Change and National Security)”, (reinstated by Executive Order of January 21, 2021). <https://obamawhitehouse.archives.gov/the-press-office/2016/09/21/presidential-memorandum-climate-change-and-national-security>; European Council. “Council Conclusions on Security and Defence in the context of the EU Global Strategy”. 17 June 2019. <https://www.consilium.europa.eu/media/39786/st10048-en19.pdf>; European Council. “Climate Diplomacy - Council conclusions”. 18 February 2019. <https://data.consilium.europa.eu/doc/document/ST-6153-2019-INIT/en/pdf>; European Council. “Climate Change and Defence Roadmap”. 9 November 2020. <https://data.consilium.europa.eu/doc/document/ST-12741-2020-INIT/en/pdf>

their GDP on defense each year by 2024, and to allocating at least 20 percent of their spending to procuring new equipment and research and development.⁷

Although a number of EU countries began to ramp up their defense spending, President Trump mischaracterized the guideline as a binding and immediate commitment and accused allies that had not met it of owing “a tremendous amount of money” to the United States.⁸ The Biden administration has dropped Trump’s confrontational tone but will continue push allies to meet the 2 percent target.⁹

A Broader Understanding of Security—Germany’s View

In response to Trump’s provocations, Germany made clear that there was no political support within Germany for the massive increases in defense spending needed to meet the 2 percent guideline. Foreign Minister Sigmar Gabriel explained that “I don’t know any German politician who would claim that is reachable or desirable.” Germany also noted the considerable contributions Germany was making to collective security through non-military expenditures, and argued that humanitarian, development, and economic aid to stabilize countries and regions should be counted.¹⁰

In 2018, total defense expenditures by NATO members was about \$930 billion— over 60 times international support for adaptation. ... Because NATO members spend so much more on traditional military capabilities than on strengthening resilience in vulnerable countries, allocating a relatively small percentage of existing and anticipated NATO spending would dramatically increase overall resilience spending.

The 2 percent Opportunity

Germany’s proposed approach could greatly increase spending on the woefully underfunded challenge of strengthening climate resilience in vulnerable countries. In 2018, total defense expenditures by NATO members was about \$930 billion— over 60 times international support for adaptation.¹¹ Since the 2 percent guideline was agreed in 2014, European allies and Canada have spent an additional \$190 billion on their national military budgets.¹² If every ally were to meet the guideline, NATO members’ total defense budgets would increase by about \$100 billion per

⁷ NATO. “Wales Summit Declaration”. 5 September 2014.

https://www.nato.int/cps/en/natohq/official_texts_112964.htm#:~:text=Allies%20who%20currently%20spend%20less,more%20of%20total%20defence%20expenditures

⁸ Time. “President Trump Says NATO Allies Owe the U.S. Money. He’s Wrong”. 11 July 2018.

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⁹ The White House. “Roadmap for a Renewed U.S.-Canada Partnership”. 23 February 2021.

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¹⁰ Reuters. “Germany balks at Tillerson call for more European NATO spending”. 31 March 2017.

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¹¹ NATO. “Defence Expenditure of NATO Countries (2012-2019)”. 2019.

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¹² Associated Press. “NATO chief urges joint spending as budget debate rolls on”. 17 February 2021.

<https://www.usnews.com/news/world/articles/2021-02-17/nato-chief-urges-joint-spending-as-budget-debate-rolls-on>

year, or almost seven times the adaptation support provided by all developed countries to developing ones.¹³

Because NATO members spend so much more on traditional military capabilities than on strengthening resilience in vulnerable countries, allocating a relatively small percentage of existing and anticipated NATO spending would dramatically increase overall resilience spending. And the law of diminishing returns strongly suggests that this incremental spending on resilience would be a far more effective way to advance NATO's collective security than continuing to focus only on expanding the capability to respond to crises after they arise.

More Creative Burden Sharing

The German approach would open new avenues for creative burden sharing among NATO's members. While Germany and other allies struggle to find political support for spending to meet the 2 percent target, the U.S. easily exceeds it. Conversely, while the U.S. has not mustered the will to fund resilience adequately, other NATO members support it more generously. Integrating resilience and traditional security concerns could facilitate a useful division of labor, in which European countries expand their contributions through increased security-related resilience finance, rather than through purchases of military hardware.

U.S. Secretary of State Blinken has indicated some openness to this approach. Speaking to NATO on 24 March, Blinken called for a "more holistic view of burden sharing." "In a world where a growing number of threats cannot be confronted with military force," he observed, "we must acknowledge that because allies have distinct capabilities and comparative strengths, they will shoulder their share of the burden in different ways."¹⁴

Ensuring Additionality

The primary benefit of broadening the understanding of burden sharing to include investments in resilience is to increase incentives for countries to provide this support. It would have little effect if it only led members to claim credit for funding that they would have provided anyway. Accordingly, clear guidelines will be needed to ensure that only funds that are additional to existing expenditures are counted.

RECOMMENDATIONS

To create stronger incentives for members to spend more on resilience measures that have a direct link to NATO security interests:

1. The U.S., as the leading advocate of the burden sharing guidelines, should:

- **Propose that spending to strengthen resilience in vulnerable countries critical to NATO's collective security count as a contribution to collective security.**

¹³ Congressional Research Service. "Assessing NATO's Value". 2019.

<https://crsreports.congress.gov/product/pdf/R/R45652>

¹⁴ Secretary of State Antony Blinken. "Reaffirming and Reimagining America's Alliances". 24 March 2021.

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RECOMMENDATIONS - Continued

2. NATO members should:

- Amend the 2 percent guideline to include new and additional investment in resilience and other preventative measures, in line with Germany's proposal;
- Encourage countries that have not yet met their 2 percent target to devote a substantial portion of their anticipated new security spending to strengthening resilience in vulnerable areas critical to NATO's collective security; and
- Develop clear guidelines to ensure that only new and additional resilience spending is counted.

3. The alliance could also:

- Adopt a new percentage guideline for resilience and other preventative measures, along the lines of the 20 percent hardware guideline; or
- Adopt a broader 3 percent guideline that includes spending on resilience, development assistance and other preventative measures alongside defense spending.¹⁵

¹⁵ Ischinger, Wolfgang. "More EU foreign and security policy". 17 February 2017.

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2.14

Security, Climate Transitions and Hybrid Threats

By Olivia Lazard

The challenge for NATO lies not just in reconceptualising risks related directly to the root causes and impacts of climate change and environmental collapse, but in anticipating the risks and threats stemming from geopolitical responses to climate change. For this, NATO needs to look at the implications of climate transitions, particularly in the United States and in the European Union. For the past year, the EU has been designing its own decarbonisation transition with the Green Deal. The election of President Biden in the U.S. signals the start of a transformative American transition in the years to come. The so-called race to net zero has officially started. This has two major implications: 1) the transition away from hydro-carbon dependent economies will impact gas and oil producing countries, including Russia and Middle Eastern powers and 2) the competing race for access to rare earth metals and related commodities for the clean transition is going to accelerate.

The challenge for NATO lies not just in reconceptualising risks related directly to the root causes and impacts of climate change and environmental collapse, but in anticipating the risks and threats stemming from geopolitical responses to climate change.

The EU is still currently over 75% dependent on fossil fuels, including gas coming from Russia as of 2021.¹ This dependency is going to dramatically decrease in the next decade, upsetting geopolitical equilibriums. Overall, countries that produce and export hydrocarbons are not planning their climate transition. They are at risk of destabilisation in the next decade, and even more so past 2030 due to European transition pathways. These countries include some that have mastered tacit aggression tactics, such as disinformation campaigns, influence operations and cyber security attacks. The competition for transition models is made up of two rather specific risk areas: the competition for raw materials needed for the transition, which is likely to lead to a new scramble for territories across the world, with physical and kinetic risks involved; and the technology/digital competition which accompanies the energy transition.

This latter phenomenon is going to produce more hybrid and cyber threats going forward. They will aim, amongst others, at undermining democratic processes, and factual information and sowing mistrust between citizens and elected officials. These tactics will aim to polarize and manipulate public opinions, including on matters of climate change and energy transitions. These risks particularly apply to the geopolitical powers undertaking their transition now, namely, the U.S. and the European Union. NATO should prepare for new types of attacks, which will likely intensify in the coming decade. These are threats that are currently largely under-investigated and under-prioritised. But they point to the

¹ Leonard, Mark, Pisani-Ferry, Jean, Shapiro, Jeremy, Tagliapietra, Simone and Wolf, Guntram. *The geopolitics of the Green Deal*. Brugel and the European Council on Foreign Relations. 2 February 2021. <https://www.bruegel.org/wp-content/uploads/2021/02/PC-04-GrenDeal-2021-1.pdf>

need for NATO to look anticipate the implications of climate transitions and to remain strong on its deterrence mandate.

With regards to access to raw materials necessary for the transition: geopolitical powers are competing in various regions of the world (Africa, Central Asia, Latin America) for access to rare earth metals and related materials. In countries like the Central African Republic (CAR), which holds untapped underground resources situated in the critical ecosystems that this country hosts, some countries are actively working to establish their influence through various means: influence operations aiming to sow distrust about European counterparts; double relations with the President and with various armed groups; training of armed forces in the country; and influencing legislative processes to gain access to territorial concessions enabling them to build aerial infrastructure and bases as well as extract minerals.

These types of methods used in such fragile contexts are geared towards ensuring extra-territorial influence as well as ensure bargaining power over new types of energy commodities. With such methods, local and national tensions in CAR will flare up considerably and increase the risks to geopolitical competition over necessary commodities in the decarbonisation process. CAR is but one example of a larger pattern at play which NATO needs to monitor.



2.15: Minerals like cobalt are at the base of the ICT industry. Their strategic importance is expected to increase.

RECOMMENDATIONS

1. Run annual interdisciplinary and civilian-military foresight, simulation, and scenario development exercises to identify, anticipate and discuss responses to emerging threats stemming from transition models and geopolitical shifts.
2. Strengthen NATO-EU cooperation on combatting cyber and disinformation threats, including that seek to directly undermine transition pathways.
3. Monitor extra-territorial geopolitical strategies designed to undermine decarbonisation transitions, including in areas central to the transition such as the Central African Republic.

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PART 3: Annexes

3.1

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1.5: Climate Change and Environmental Collapse: Scope of Responses

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2.1: Reconceptualizing Risks and Security

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2.4: Emerging Theatres: West Africa and Macaronesia

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2.5: Emerging Theatres: The Arctic

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2.6: Emerging Theatres: The Mediterranean

NASA Visible Earth, Image Provided by the SeaWiFS Project, NASA/Goddard Space Flight Center, and ORBIMAGE, Data acquired September 10, 2000,.

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2.7: Education and Training

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2.8: Treaty Amendment

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2.9: Commitment to Environmental Standards and Audits

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2.10: Addressing Environmental Consequences in Armed Conflicts

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2.11.a: Commitment to Clean Energy Transition and Energy Audits

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2.12: Smart Energy: Less Fuel, More Power

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2.13: NATO and the Crisis in Resilience Investment

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2.14: Security, Climate Transitions and Hybrid Threats

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3.2

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Lieutenant-Colonel David Burbridge has served as an Engineering Officer in the Canadian Armed Forces since 2000. He is currently the Commanding Officer of Real Property Operations Unit (Pacific). His unit has responsibilities for maintenance and repair, minor construction, property management, environmental compliance, Indigenous consultation, and energy management for all defence real property throughout British Columbia. From 2016-2020, he was posted to NATO's Supreme Headquarters Allied Powers Europe (SHAPE) as Staff Officer (Environmental Protection and Energy Efficiency). He holds an MSc in Environmental Science from the Royal Military College of Canada. He is also a member of the [Global Military Advisory Council on Climate Change \(GMACCC\)](#).

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Dr Rita Floyd (PhD, 2007 Warwick) is Senior Lecturer in Conflict and Security in the Department of Political Science and International Studies at the University of Birmingham. She was previously a Birmingham Fellow in Conflict and Security at UoB and before then British Academy Post-doctoral and ESRC Post-doctoral Fellow (both at The University of Warwick). She is the author of numerous peer-reviewed articles on security theory, environmental security and ethics and security. She is the author of [Security and the Environment: Securitisation Theory and US Environmental Security Policy \(Cambridge University Press, 2010\)](#). Her second monograph entitled [The Morality of Security: A Theory of Just Securitization](#) was published by Cambridge University Press in 2019. This book offers a new way of approaching ethics and security by bringing together insights from moral philosophy via the just war tradition, and Security Studies via securitization theory. This book develops principles of just securitization concerned exclusively with when securitization (i.e. the use of emergency politics whereby putative threats are addressed using exceptional means) is morally permissible. Dr Floyd is currently working on a follow-up monograph theorising whether, and if so what kind of, actors can have a moral obligation to securitize, to what referent objects. This book is provisionally called *The Duty to secure: From just to mandatory securitization*.

Marco Grandi is Military Specialist at [PAX Netherlands](#) focusing on Protection of Civilians (PoC) training solutions and exercises for military audiences. Marco served as a military officer for 20 years. He has covered a range of positions including aircrew, intelligence, logistics and training, as well as having served multiple deployments to Afghanistan and within the Mediterranean but has also had experience in emergency disaster response. Marco has served within NATO's strategic command at Supreme Headquarters Allied Powers Europe (SHAPE), where he supported Civil-Military Cooperation efforts and was part of the Alliance's implementation and operationalization efforts with regards to NATO's PoC policy. He has also considerable experience in military planning, training development and delivery, Exercise Planning, and as a NATO Evaluator. Marco has a Bachelor's in Political Science, and a Master's in Strategic Analysis and Leadership. Marco provides PAX with military advice and works on PoC focused training solutions and exercises for military audiences.

Steve Herz is a Senior Attorney/Senior International Climate Policy Advisor with the Sierra Club's International Climate and Policy Campaign. He has almost 20 years of experience as an international lawyer, advocate, and policy analyst, with extensive background in national and international climate policy, environmental and human rights law, climate finance and energy policy. Steve is the author of numerous articles, book chapters, and reports on these issues. Recent publications include [A Foreign Policy for the Anthropocene](#), Co-author, [A Climate-First Foreign Policy, Interests, Not Altruism, Drive China's New Climate Ambition](#), Co-author, [How to Retire Early: Making Accelerated Coal Phaseout Feasible and Just](#), [Paris is Not Enough: Why the Paris Agreement Isn't Driving More Climate Action....And How it Could](#), and [Making Paris Work](#). He holds degrees in government (B.A.), law (J.D.) and history (M.A.) from the University of Virginia.

Brigadier General Wendell Christopher King (RET.) is Dean Emeritus, U.S. Army Command and General Staff College where he served as the Chief Academic Officer directing a college faculty of over 400 people organised into five separate schools. After numerous environmental engineering assignments with the U.S. Army domestically and in Europe, he was deployed in 1991 as the Officer in Charge of the Southwest Asia Health Risk Assessment Team to determine health risks to US troops exposed to the smoke from the Kuwait oil fires and to support the restoration of Kuwait. For this he won the American Academy of Environmental Engineering Honor Award. He is also a founding member of the Global Military Advisory Council on Climate Change (GMACCC).

Ronald A. Kingham is co-founder and Executive Director of the [Environment & Development Resource Centre \(EDRC\)](#), which coordinates the [Brussels Dialogue on Climate Diplomacy \(BDGD\)](#), the [Global Military Advisory Council on Climate Change \(GMACCC\)](#), and the project on [Transatlantic Responses to 21st Century Environmental Challenges](#). He is also co-founder and former Director of

the [Institute for Environmental Security \(IES\)](#), where he continues as Brussels Liaison and Senior Advisor. He was a member of the team that prepared the [first Planetary Security Conference](#) in the Peace Palace in The Hague in November 2015 and helped develop the follow up [Planetary Security Initiative](#).

His publications include: Co-editor, [Planetary Security: Peace and Cooperation in Times of Climate Change and Global Environmental Challenges - Conference Report](#), 2016, Editor, [Climate Change and Security in South Asia: Cooperating for Peace](#) (ed.) 2014, Rapporteur, [Report of the OSCE Participatory Workshop on Environment and Security Issues in the Southern Mediterranean Region](#), 2012, Co-author, [Recent Trends in EU External Action in the Fields of Climate, Environment, Development and Security: Report for the European Space Agency](#), 2011, and Editor, [Inventory of Environment and Security Policies and Practices: An Overview of Strategies and Initiatives of Selected Governments, International Organisations and Inter-Governmental Organisations](#), 2006.

[Georgios Kostakos](#) is co-founder and Executive Director of the [Foundation for Global Governance and Sustainability \(FOGGS\)](#) with almost thirty years of work experience in international affairs, both as a practitioner and as a researcher. His experience includes fourteen years with the United Nations, with assignments such as observing the elections that ended apartheid in South Africa (1994), promoting human rights in Haiti (1995), reporting from post-Dayton Bosnia (1996), serving as Assistant Secretary of the [UN General Assembly's Committee on the Exercise of the Inalienable Rights of the Palestinian People](#) (2000-2003), promoting UN strategic planning and reform as First Officer in the UN Secretary-General's Strategic Planning Unit (most of 2003-2006), organising the [first ever high-level event on climate change in New York](#) (2007), advancing the UN system delivering as one on climate change from the Secretariat of the [UN System Chief Executives Board for Coordination](#) (CEB, 2008-2009), laying the ground for the Sustainable Development Goals as Senior Adviser and Acting Deputy Executive Secretary of the UN Global Sustainability Panel (GSP, 2010-2012), supporting the negotiations that resulted in the Paris Agreement on Climate Change (UNFCCC COP21, 2015).

[R. Andreas Kraemer](#), Founder & Director Emeritus of [Ecologic Institute](#) in Berlin, and Chairman (pro bono) of [Ecologic Institute US](#) in Washington DC, is non-executive Director of the [Fundação Oceano Azul](#) in Lisboa, and Visiting Assistant Professor of Political Science and Adjunct Professor of German Studies at [Duke University](#) as well as adjunct teaching faculty at the [EADA Business School](#) in Barcelona. He is also Initiator and Convenor of the [Arctic Summer College](#). His research focuses on the role and functions of science-based policy institutes or "think tanks" in theory and the practice in different political systems, the interactions among policy domains and international relations, and global governance on environment, resources, climate, and energy.

[Marie Lamensch](#) is the project coordinator at the [Montreal Institute for Genocide and Human Rights Studies](#) at Concordia University. Born in Belgium, Marie has lived in Germany, France, Canada and the UK. After completing a Bachelor's degree in History (specialization in Genocide studies) at Montreal's Concordia University, Marie volunteered in Ghana and Rwanda for several months where she also conducted research on reconciliation. She has Master's degree in Conflict, Security and Development from King's College London department of War Studies. She specialized in complex political emergencies, post-conflict reconciliation and women's role during conflicts.

[Olivia Lazard](#) is a visiting scholar at [Carnegie Europe](#). Her research focuses on the geopolitics of climate, the transition ushered by climate change, and the risks of conflict and fragility associated to climate change and environmental collapse.

Olivia is an environmental peacemaking and mediation practitioner as well as a researcher. She has over twelve years of experience in the peacemaking sector at field and policy levels. With an original specialization in the political economy of conflicts, she has worked for various NGOs, the UN, the EU, and donor states in the Middle East, Latin America, Sub-Saharan and North Africa, and parts of Asia. In her fieldwork, her focus was to understand how globalization and the international political economy shaped patterns of violence and vulnerability patterns as well as formed new types of

conflict systems that our international governance architecture has difficulty tackling with agility. It is also through fieldwork that she came to observe the ways in which the plundering of ecosystems feeds conflict systems across the world and contributes to climate disruptions.

Her research at the field level and on thematic issues has led to support the European External Action Service in integrating environmental peacemaking as part of their mediation toolkit. Prior to joining Carnegie Europe, Olivia set up her own consultancy firm, Peace in Design Consulting, which remains exclusively active in conflict and fragile zones.

Dr Susanne Michaelis is a Former Science Officer, NATO Headquarters. Before her retirement in 2020, she worked for nearly 24 years at NATO 's Scientific Affairs, Public Diplomacy and Emerging Security Challenges Divisions, promoting security cooperation on topics mostly related to [environment, climate and energy](#). She developed concepts, events and projects supported by [NATO's Science for Peace and Security \(SPS\) Programme](#), established stakeholder communities and helped integrating the topics in high-level NATO documents.

In 2012, Susanne created 'NATO Smart Energy', an initiative aimed at reducing the fuel consumption of NATO forces. A highlight of this initiative was the NATO Smart Energy camp that she set-up with contributions by Allied nations in the [Capable Logistician exercises 2013, 2015 and 2019](#). Susanne made a collection of public information available at the NATO-hosted Internet platform "[NATO LibGuide Smart Energy](#)". In 2004, Susanne negotiated the partnership of NATO with the [Environment and Security Initiative \(ENVSEC\)](#) under which international organisations coordinate their support to regions prone to environmental disasters. She highlighted the link between environment and security through news stories, exhibitions and video clips. These included a series of interviews with GMACCC members at the [NATO workshop on energy and environmental risks facing the Alliance](#).

Susanne represented NATO in a number of international events and initiatives, such as [EDA's Consultation Fora](#), the [Combat Engineering Conferences](#) and climate conferences, including [Climat et Défense: quel enjeux?](#) organised by the French government in 2015 as a contribution to COP21. Susanne obtained her PhD in molecular biology/human genetics at the "Westdeutsches Tumorzentrum Essen". Her publications include [Improving Security and Stabilisation Through Environmental Protection. \(2017\)](#) and [NATO Forces and Energy Efficiency \(2017\)](#). She is also a member of the Global Military Advisory Council on Climate Change (GMACCC).

Larry Moffett is Advisory Board Member at JEUNE aisbl, the Young Entrepreneurs Organization of the European Union. His is also Founder and owner of e-Strategy sprl, a business consultancy based in Brussels, Belgium, specialised in international business development for small companies in the IT sector and co-founder and former board member and Vice President of European Young Innovators Forum. He participates in the Brussels Dialogue on Climate Diplomacy (BDCD) as a representative of [Rise for Climate Belgium](#), a non-partisan grassroots citizen movement that is putting pressure on the Belgian government and the European institutions to take urgent and radical action to fight climate change.

Ashley McIlvain Moran is an independent consultant based in Austin, Texas. She directs the State Fragility Initiative at the [Robert Strauss Center for International Security and Law](#) at the University of Texas at Austin and recently led projects for [USAID's Office of Conflict Management and Mitigation](#) and UN Security Council member states. At the University of Texas, she previously led the Strauss Center's U.S. Department of Defense-funded program on [Climate Change and African Political Stability](#), served as a core researcher on its DoD-funded program on [Complex Emergencies and Political Stability in Asia](#), and taught on security and development in fragile states at the LBJ School of Public Affairs. Overseas, she previously served as parliamentary advisor in Georgia for the [National Democratic Institute for International Affairs \(NDI\)](#), ran democratic reform programs and trainings in Iraq and Azerbaijan for NDI, and designed rule of law programs in Kyrgyzstan for the Organization for Security and Co-operation in Europe. She currently focuses on post-conflict constitutional

development, the evolution of new institutions, dynamics of state identity and legitimacy, and crisis risks from climate stress in fragile contexts.

Lieutenant Dominique Noome is a Functional Specialist (Reserves) in the Royal Netherlands Army and member of the [Global Military Advisory Council on Climate Change \(GMACCC\)](#). Through a series of publications and events on this topic she aims to raise institutional awareness and foster action to mitigate the impact of climate change on international security. After having worked for conservation organisation IUCN and in a National Park in Malawi for a couple of years, Dominique Noome co-founded the [Ranger Campus Foundation](#) in 2016, aiming to support wildlife rangers. As the main line of defence for the world's biodiversity, rangers often struggle to get access to adequate training as well as equipment in order to perform their job safely and effectively. As Co-Founder and Program Lead for [LEAD Ranger](#) since 2017, Dominique is responsible for the day-to-day management of this innovative ranger train-the-trainer program operating in Africa.

She is also co-author, with Major Piet Wit, of [“Winning the Environment: The Ecosystem Approach and its Value for Military Operations”](#), second edition, 2016 and, co-author, with of Marianne Kettunen and Johanna Nyman of [“Reinforcing Environmental Dimensions of European Foreign and Security Policy”](#), January 2019.

Stavros Pantazopoulos is the Legal and Policy Analyst of the [Conflict and Environment Observatory](#). Stavros completed his PhD thesis at the European University Institute and his doctoral research focused on the protection of the environment from the impacts of an armed conflict. He is also a researcher at the [Athens Public International Law Center](#) and has published in the fields of international humanitarian law, international environmental law, and autonomous weapons systems.

Dr Radostina Primova is a Senior Analyst at the [Center for the Study of Democracy](#) in Sofia where she focuses on energy transition, energy security and international climate policies, as well as the external dimensions of EU trade and mobility policies.

Prior to this, she was the Head of the Energy and Climate Programme of the Brussels office of the [Heinrich-Böll-Foundation European Union](#), where she was directing the project activities on climate, energy and agricultural policies and providing advice for European and international delegations on these topics. Radostina has been leading key projects of the Foundation, including the [Energy Atlas](#), the [Atlas of Environmental Migration](#), the [Energy Transition Blog](#), From Paris to Sustainable Development (promoting the role of human rights and gender in EU external climate actions) and the role of subnational climate leadership.

She was also the responsible editor for the European perspectives on www.energytransition.org, the foundation's signature website around all questions concerning the politics of energy transition. She has been coordinating the Foundation's network EnergyTransition@EU, a joint project between the offices in Berlin, Brussels, Paris, Prague, Thessaloniki and Warsaw.

Megan Richards is a Visiting Senior Fellow at the [German Marshall Fund of the United States, Brussels](#). She was Director of Energy Policy in [DG Energy \(ENER\) of the European Commission](#) from 1 April 2017 to 31 June 2019. From May 2009 she was in DG Connect, holding positions of Director of General Affairs, Director of Converged Networks and Services, Director Coordination, acting Deputy Director General, and Principal Adviser. From 2013-2014 she was EU Fellow at the [Weatherhead Center for International Affairs at Harvard University](#). From September 2006 - April 2009 she was the Director of Resource management in the Commission's [Joint Research Centre](#). She joined the European Commission in 1991 initially working on programmes to support SMEs, research and innovation, including regulatory, legal, financial and contractual issues.

She has worked for the United Nations Development Programme (UNDP) in Africa, the Inter-American Development Bank in Washington, the government of Canada, and private law firms. She has a Bachelor of Science, Bachelor of Laws and Master of Public Administration degrees.

Arne Riedel is a Senior Fellow at Ecologic Institute, Berlin, Germany and coordinates the Ecologic Legal team as well as the Institute's activities on Arctic issues. He works on Arctic, climate and energy issues. This includes the international climate negotiations, environmental compliance, renewable energy law, municipal climate action, and the EU emissions trading system (ETS). Arne Riedel was admitted to the bar in Berlin (Germany) in 2012. He works in German and English.

At Ecologic Institute, Arne Riedel supports the [Federal Ministry of the Environment, Nature Conservation and Nuclear Safety \(BMU\)](#) in the negotiations under the UN Framework Convention on Climate Change and the Paris Agreement. Since 2020, he is a member of the Kyoto Protocol Compliance Committee (Enforcement Branch). For the [Federal Environmental Agency \(UBA\)](#), Arne Riedel leads a project on Environmental Compliance Assurance in Germany.

He also supports the [Federal Agency for Nature Conservation \(BfN\)](#) on Arctic marine protected networks and their governance, as well as the EU Commission's DG Mare on ocean literacy with a focus on the Arctic. Previously, he supported the UBA with the development of "Environmental Guidelines for a German Arctic Policy", the [WWF International Arctic Programme on its "Arctic Council Scorecards"](#), and the EU External Action Service (EEAS) on the ["EU Arctic Policy Assessment"](#).

Amanda (Mandy) Rude, JD is an expert in environmental crime. She has worked for the U.S. Department of State and the [Global Initiative Against Transnational Organized Crime \(GITOC\)](#) after receiving her law degree specialising in environmental law at Lewis & Clark College of Law. She has experience in international environmental and wildlife trade law and policy analysis, organized crime programmes and management. She has regional experience working in Asia, both doing field work in Mongolia for [Legal Atlas](#) on wildlife trade policy and in Malaysia on corruption and wildlife trade. Mandy is a co-author of: Silent Steppe 2: Illegal Wildlife Trade in Mongolia. Mandy is currently based in the United States and works for [IISD-Earth Negotiations Bulletin](#) as a writer covering environmental treaty negotiations. She is also currently a contributing committee member of the [IUCN World Commission on Environmental Law \(WCEL\)](#) and its Specialist Group on Peace, Security, and Conflict.

Alessandro Secchi is a MA International Relations Graduate from Leiden University, where he focused on security issues in the East-Asian Region and in relation with environmental changes. He aims at pursuing a career in international organisations and hopes to continue working on the nexus between environment and security. He is also a Programme Assistant with the [Environment & Development Resource Centre \(EDRC\)](#) where he assists with the coordination of EDRC's programme on integrating development, environment, and security.

Dr Jamie Shea is Professor of Strategy and Security within the [Strategy and Security Institute at the University of Exeter](#) and President, [Centre War Studies, Southern Denmark University](#). He is also Senior Fellow responsible for Security and Defence Programs at [Friends of Europe](#), Senior Advisor with the European Policy Centre and Secretary General of the [Global Military Advisory Council on Climate Change](#). From 1980 to 2018, he was a member of the International Staff of NATO where his last position was as Deputy Assistant Secretary General for Emerging Security Challenges.

Wilbert van der Zeijden is Team Coordinator Protection of Civilians & Project Lead Protection in Practice (PiP) at [PAX Netherlands](#). He's an international relations specialist and a graduate of the Vrije University in Amsterdam. Previously he coordinated the 'Militarism and Globalisation' program at the [Transnational Institute](#) (2001-2009) and he was senior researcher in the Humanitarian Disarmament team of PAX (2010-2015). His current focus within the PoC team includes the international developments in PoC policy making and implementation, civilian harm, and European security.

Alexander Verbeek is Policy Director of the [Environment & Development Resource Centre \(EDRC\)](#) and co-coordinator of the [Brussels Dialogue on Climate Diplomacy \(BDGD\)](#). He is also a public speaker and writer on humanitarian and geopolitical risk issues, and the linkage to the earth's accelerating environmental crisis. He is a Yale World Fellow and Associate Fellow at the [Geneva Centre for Security Policy](#).

Alexander writes The Planet newsletter, <https://theplanet.substack.com/>, and is recognised online as an influential leader to follow on climate change. His online following on all social media is more than 400,000. His main Twitter site is @alex_verbeek.

He was a diplomat for the Netherlands Ministry of Foreign Affairs from 1992 until 2016. His last position was Strategic Policy Advisor on Global Issues. He had postings in Vienna (OSCE), Bonn, and London. At MFA headquarters in The Hague, he also worked in the Middle East Department, twice in the security department and for several years in the Asia department.

Alexander created the Planetary Security Initiative, led the team that prepared the [first Planetary Security Conference](#) in the Peace Palace in The Hague in November 2015, and helped develop the follow-up [Planetary Security Initiative](#), serving as Chairman of the Advisory Board from 2016 until 2018.

[Doug Weir](#) is the Research and Policy Director of the [Conflict and Environment Observatory](#). He has undertaken research and advocacy on the polluting legacy of armed conflicts and military activities since 2005. Doug has contributed to a wide range of domestic, regional and international initiatives on conflict and the environment, with a current focus on the work of the UN Environment Assembly.

[Wim Zwijnenburg](#) is a Humanitarian Disarmament Project Leader for the Dutch peace organisation PAX. His work focuses on emerging military technologies and their impact on how wars are being fought and consequences for arms proliferation. He is the author of the reports [Does Unmanned Make Unacceptable, Armed & Dangerous](#), and the latest report on drone proliferation [Unmanned and Uncontrolled](#). He also works on the impact of conflict on the environment and has been involved in the Control Arms campaign on the Arms Trade Treaty. He holds a Masters in International Development Studies and received a Philosophy scholarship from the Thomas More Foundation.

3.3

North-Atlantic Civil-Society Working-Group on Environment and Security Members

Organizational Members



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Mr Andrew Holland, Chief Operating Officer

Budapest Centre for Mass Atrocities Prevention

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Mrs Beatrice Godefroy, Europe Director

Center for Climate and Security (CCS)

Ms Shiloh Fetzek, Senior Fellow for International Affairs, Center for Climate and Security (CCS) /
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Center for the Study of Democracy (CSD)

Dr Radostina Primova, Senior Analyst, Economic Program

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Mrs Linsey Cottrell, Environmental Policy Officer

Dr Stavros Pantazopoulos, Legal and Policy Analyst

Mr Doug Weir, Research and Policy Director

Council on Strategic Risks (CSR)

Mr Francesco Femia, Co-Founder and Research Director, CSR / Co-Founder,
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Ms Jeannette E. Mullaart, Senior Fellow

Ms Amanda (Mandy) Rude, Legal Analyst, Environmental Crime

Mr Alessandro Secchi, Programme Assistant

Mr Alexander Verbeek, Policy Director

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Ms Julie Raasteen, Environmental Peacemaking Officer, Peace Practice and Innovation

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Ms Shirleen Chin, Senior Legal Advisor
Dr Marcel Leroy, Senior Advisor
Mr Steven Lovink, Co-founder/ Senior Advisor
Mr Wouter Veening, Chairman / President

Institute for Planetary Security (IPS)

Mr Alexander Verbeek, Director

International Military Council on Climate and Security (IMCCS)

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Montreal Institute for Genocide and Human Rights Studies

Ms Marie Lamensch, Project Coordinator, Human Rights
Mr Kyle Matthews, Executive Director

PAX Netherlands

Mr Marco Grandi, Military Specialist
Mr Wilbert van der Zeijden, Team Coordinator Protection of Civilians /
Project lead Protection in Practice
Mr Wim Zwijnenburg, Project Leader, Humanitarian Disarmament

Sierra Club

Steven Herz, Senior Attorney and International Climate Policy Advisor, International Climate and
Policy Campaign

Quaker Council for European Affairs (QCEA)

Ms Atia Alwazir, Peace Programme Lead (*as of 1 Feb 2021*)
Ms Olivia Caeymaex, Peace Programme Director (*Until 1 Feb 2021*)
Ms Clemence Buchet-Couzy, Peace Programme Assistant

Rise for Climate Belgium

Mr Larry Moffet, Coordinator

Safety and Risk Mitigation Organization (SRMO)

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Ms Marla Keenan, Non-resident Fellow, Stimson Center

Ms Olivia Lazard, Visiting Scholar, Carnegie Europe

Mrs Ashley McIlvain Moran, University of Texas at Austin

Ms Megan Richards, Visiting senior Fellow, German Marshall Fund of the United States, Brussels

Mr Arne Riedel, Senior Fellow, Ecologic Institute

Ms Lauren Risi, Director, Environmental Change & Security Program, Wilson Center

Sustainable Peace & Security in a Changing Climate: Recommendations for NATO 2030



In response to the opportunity for civil society organisations to contribute input in the NATO 2030 process, the Environment & Development Resource Centre (EDRC) invited the non-governmental organisations participating in the Brussels Dialogue on Climate Diplomacy (BD CD) and other NGOs, think tanks and individual experts to form the informal **North-Atlantic Civil-Society Working-Group on Environment and Security (NCWES)** to exchange ideas and produce this report.

This report is not a blueprint of what should be done; it is a collection of 116 policy options and practical recommendations to be considered in the NATO 2030 process that we believe can help strengthen the organisation in a time of new environmental-related challenges in the interest of promoting sustainable peace and security for all.

"NATO countries spend almost a trillion (US \$ 930 billion in 2018 alone) annually on defense. At such a level of investment, NATO needs to recognize the significant impact climate change is having on our collective security, from the Arctic down to Africa - all areas under their purview. This report - put out by NCWES - is a seminal document that lays the groundwork for NATO to counter climate change. A must read for all concerned about security and climate change worldwide!"

- **Brigadier General Stephen A. Cheney**, USMC (Ret), President, American Security Project, Washington, DC

"Environmental challenges, including climate change, will increasingly threaten the security of all nations. This thoughtful analysis by NCWES provides a wide range of ideas for NATO and its member nations to improve understanding of vulnerabilities, develop strategies, and work to scale appropriate responses. The report is essential reading for anyone who cares about NATO's future role in protecting global peace."

- **The Hon Alice Hill**, David M. Rubenstein Senior Fellow for Energy and Environment, Council on Foreign Relations, Washington, DC

"If it is to remain relevant and operationally effective NATO must not only acknowledge the impact of a changing climate on global security but also, through the actions of member states, work to reduce the risks posed to our prosperity and wellbeing. Such action is for today, not tomorrow, and this wide-ranging report makes crystal clear what needs to be done, by whom, and how; I strongly commend it to all in positions of leadership."

- **Rear Admiral Neil Morisetti**, RN (Rtd), Vice Dean (Public Policy), Faculty of Engineering Sciences, University College London

"Unless the world invests decisively in the future of life on Earth, NATO, its allies, and the military complex at large will become very busy fixing problems, managing crises, conflict, or worse. ... Operating as a future-oriented genuine Force for Good, NATO has a unique opportunity to lead by fostering 21st Century local to global security arrangements and by reallocating a meaningful and growing portion of the defense budget to serve and protect both people and planet".

- **Steven Lovink**, Co-founder, Institute for Environmental Security
