COMMENTARY

Transforming Defense and Community Climate Action and Resilience

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Abstract

Climate change poses an existential threat to global security. However, defense forces, as major greenhouse gas emitters, lack emissions reporting requirements and climate adaptation plans. This article analyzes current deficiencies and advocates for improved climate risk assessment, measurement, transparency, target setting, and mitigation by defense forces. It introduces tools to build climate awareness and catalyze action across military and civilian spheres. Specifically, a C4 model (command, control, climate, and community) integrates top-down and bottom-up approaches. Meanwhile, the CLARA framework (communicate, leadership, awareness, risk and resources, and action) provides guidance for defense forces to assess and reduce risks. Establishing a methodology for comparability and accountability, as NATO has done, is advised. With unprecedented climate impacts already occurring, urgent collaborative action is imperative. Defense forces must show leadership in understanding, communicating and reducing their own emissions, while supporting societal resilience.

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The climate crisis poses the single greatest threat to the livelihoods, security, and well-being of people worldwide, including defense forces and their families. Human activities, primarily through the emission of greenhouse gases, unequivocally caused global warming, with the global surface temperature reaching 1.1°C (3.6°F) above 1850–1900 in 2011–2020. Global greenhouse gas emissions continue to rise, with unequal historical and ongoing contributions stemming from unsustainable energy use, land use changes, lifestyles, and consumption and production patterns across regions, countries, and individuals (high confidence).[1]

US Secretary of Defense Lloyd J. Austin III spoke at the Leaders Summit on Climate, stating, "Today, no nation can find lasting security without addressing the climate crisis. We face all kinds of threats in our line of work, but few of them truly deserve to be called existential. The climate crisis does. . . . climate change is mak-

[1] H. Lee and J. Romero, eds., *Climate Change 2023: Synthesis Report. Contribution of Working Groups I, II and III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change* (Geneva: Intergovernmental Panel on Climate Change, 2023), 1–34, https://www.ipcc.ch/.

ing the world more unsafe and we need to act."[2] While these are powerful words, what is missing is the implementation of SMART (specific, measurable, achievable, realistic, and timely) actions.

Military operations, including those involving planes, tanks, and ships, require vast amounts of energy derived from fossil fuel sources. Among the world's largest fuel consumers, militaries account for 5.5 percent of global greenhouse gas emissions.[3] To illustrate in dollars rather than percentages, during missions in Afghanistan and Iraq, the US military spent over USD 20 billion annually on air-conditioning for troops.[4]

Surprisingly, defense forces are not obligated by international climate agreements to report or reduce their carbon emissions, and the data published by some militaries is unreliable or incomplete. This is because military emissions abroad, from flying jets to sailing ships to training exercises, were excluded from the 1997 Kyoto Protocol on reducing greenhouse gases and were again exempted from the 2015 Paris Accords. The rationale behind this exemption is that data on energy use by armies could undermine national security.

Defense plays a crucial role in supporting the community and government's climate and disaster resilience agenda by incorporating climate risk into the planning and execution of its activities and operations.

Impact

Obtaining accurate, comparable data on impacts such as fuel use and carbon footprint for defense forces worldwide is challenging. However, a valuable resource, The Military Emissions Gap database, provides useful information for measuring and comparing some emissions.[5] This reveals limited data from the United States, Canada, United Kingdom, and stationary emissions from China at 108.35 and Russia at 40.72 metric tons of carbon dioxide equivalent ($MTCO_2e$).

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[2] David Vergun, "Defense Secretary Calls Climate Change an Existential Threat," DOD News, 22 April 2021, https://www.defense.gov/.

[3] Sarah Mcfarlane and Valerie Volcovici, "Insight: World's war on greenhouse gas emissions has a military blind spot, *Reuters*, 10 July 2023, https://www.reuters.com/.

[4] Shirley V. Scott and Shahedul Khan, "The Implications of Climate Change for the Military and for Conflict Prevention, Including through Peace Missions," *ASPJ Africa & Francophonie* 7, no. 3 (2016) : 82 – 94, https://www.airuniversity.af.edu/.

[5] "The Military Emission Gap," *Conflict and Environment Observatory* and *Concrete Impacts*, 2021, https://militaryemissions.org/.

Additional sources from government and media suggest US emissions of 51 $MTCO_2e$ and UK emissions of 3.34 $MTCO_2e$.[6] A noteworthy comparison highlights that the UK armed forces contribute to 50 percent of the UK government's emissions, while the US military similarly accounts for 56 percent of US government emissions. It stands as the world's largest institutional petroleum user and carbon emitter, ranking as the 55th largest CO_2 emitter if considered a separate country, underscoring its substantial impact.[7]

Why?

While we commonly perceive human-induced climate change as a future event, it is an ongoing process. Presently, ecosystems, communities, and people in 195 countries worldwide are experiencing its impact.

Critical Thresholds

To avoid surpassing the 1.5-degree Celsius global warming threshold established in the Paris Climate Agreement, numerous countries have set a long-term objective to attain net-zero emissions by 2050.[8]

Huge Gaps in Targets, Commitments, and Leadership

In November 2023, the Earth's temperature briefly exceeded the 2-degree Celsius threshold, a limit scientists have long warned could lead to catastrophic and irreversible impacts on the planet and its ecosystems. Warming to 2 degrees places a larger portion of the population at risk of deadly extreme weather and raises the likelihood of the planet reaching irreversible tipping points, such as the collapse of polar ice sheets and the mass death of coral reefs.[9]

A significant disparity, calculated from the UN's Intergovernmental Panel on Climate Change's 2018 report, reveals that CO_2 emissions need to be reduced by

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[6] Defence Committee, UK House of Commons, *Defence and Climate Change. Eighth Report of Session 2022-23* (London: House of Commons, 18 August 2023), https://committees.parliament.uk/.

[7] Louise van Schaik et al., *The World Climate and Security Report 2022: Decarbonized Defense—Combating Climate Change and Increasing Operational Effectiveness with Clean Military Power, The Need for Clean Military Power in the Age of Climate Change*, ed. Erin Sikorsky and Francesco Femia (Washington, DC: Center for Climate and Security, June 2022), https://imccs.org/wp-content/.

[8] van Schaik et al., *The World Climate and Security Report 2022*.

[9] United Nations, *Nationally determined contributions under the Paris Agreement: Synthesis report by the secretariat* (Sharm el-Sheikh, Egypt: United Nations, 6–18 November 2022), https://unfccc.int/.

45 percent by 2030, compared to 2010 levels. Current commitments, however, are on track to increase emissions by 10.6 percent by 2030, compared to 2010 levels.[10]

Contrary to accelerating efforts to address rising emissions, progress on climate adaptation is slowing globally.[11] Defense, much like the rest of the world, is underprepared, underinvested, and lacks the necessary planning, leaving everyone exposed.

Assuming the role of a global leader is no easy task. Rear Admiral Paul Beattie, Director Naval Staff, Royal Navy, recently characterized the measures required for climate change adaptation in the military as the ". . . biggest change programme in defence." He noted that, unusually for technology, countries "can't look to the US "for global leadership and that some were therefore looking to the UK."[12]

However, perhaps attention should be directed to the community advocating solutions. They propose that "states should put military emissions on the table at COP28. They must also commit to improving the standard, scope, frequency and transparency of their reporting. This commitment must be backed by pledges for meaningful, credible and verifiable cuts to their emissions."[13]

Starting with a Simple Tool

A fundamental distinction between traditional top-down approaches of government and defense and the bottom-up approach of the community lies in the level of detail and granularity of the data. The bottom-up approach furnishes detailed information on individual sources, while the top-down approach offers more general information on overall emissions.

Is it possible to identify a middle ground or tool that could be comprehended and acted upon by the government, defense, and communities? We propose a simple tool based on an acronym as a potential starting point to assist defense personnel in sharing knowledge, understanding, and implementing climate actions. Acronyms, which utilize the first letters of words or phrases in a list or sequence of events to create a new word, prove effective in aiding memory. Acronyms are widely employed, especially within defense forces. Examples include AAAV (Ad-

[10] United Nations Environment Programme, *Adaptation Gap Report 2023: Underfinanced. Underprepared. Inadequate investment and planning on climate adaptation leaves world exposed* (Nairobi: United Nations, November 2023), https://doi.org/.

[11] Seamus Hoyne, "Climate leadership—what does it really mean?," *European Sustainable Energy Week* (blog), 28 February 2023, https://sustainable-energy-week.ec.europa.eu/.

[12] William Leben and Ulas Yildiri, "Aggressive action required to meet Defence's ambitious emissions-reduction target," *The Strategist*, 27 September 2022, https://www.aspistrategist.org.au/.

[13] Pierre Barthélemy, "The CBDR principle in the climate negotiations: deadend or new start?," *IDDRI* (blog), 10 December 2015, https://www.iddri.org/.

vanced Amphibious Assault Vehicle), ADF (Australian Defence Forces), ANZAC (Australian and New Zealand Army Corps), DOD (Department of Defense), JCS (Joint Chiefs of Staff), NCO (noncommissioned officer), XO (executive officer), FOB (forward operating base), and USINDOPACOM (US Indo-Pacific Command).

Similarly, numerous specific acronyms are known for nonmilitary processes, such as first aid (DRSABCD: danger, response, send, airway, breathing, CPR, defibrillation), diving (SCUBA: self-contained underwater breathing apparatus), management (SWOT: strengths, weaknesses, opportunities, and threats; SMART: specific, measurable, achievable, relevant, and time-bound; PESTEL: political, economic, social, technological, legal, and environment), and the environment (EIS: environmental impact statement; GHG: compressed hydrogen gas; C02 carbon dioxide).

This article proposes that the acronym CLARA is straightforward and may serve as a tool to facilitate the sharing of knowledge, inspire action, and translate intentions into climate action for both defense and the millions of individuals seeking a starting point:

C – Communicate

L – Leadership

A – Awareness

R – Risk and Resources

A – Action

There have been other acronyms proposed as potential saviors of the world. Have you ever come across CBDRILONCWRC? Probably not, and neither have I. It is a cumbersome 12-letter term that is challenging to pronounce, standing for "Common but Differentiated Responsibility in Light of National Circumstances with Respective Capability."14

Let us opt for something simpler, easier to remember, and pronounce. CLARA (named after the Impossible Girl, Clara Oswald, from the fictional TV series "Dr. Who") assists you in identifying key factors for climate, communication, capacity, leadership, and awareness for both individuals and organizations. It guides you to capitalize on strengths, address shortcomings, minimize risks, communicate actions, and contribute to creating a sustainable future.

Providing Solutions That Are Easy to Understand and Actualize

Saving the world or changing behavior is undoubtedly a challenging task, but nothing worthwhile ever comes easy. We present two models, C4 and CLARA, offering a straightforward solution for both defense and the community.

In the military context, defense recognizes that command and control (C2) is a critical enabler for all military organizations. C2 encompasses tactical, operational, and strategic levels, applicable in both operations and peacetime, and spanning the entire spectrum of conflict. However, a community approach is equally crucial, supporting or opposing military endeavors and contributing to reshaping public thought, shifting cultural tendencies, and instigating lasting changes in behaviors.[14] Perhaps it is time to transition from the old model to a new model, C4 (command, control, climate, and community)?

For all defense-based approaches aiming to plan, bridge gaps, and reduce risks, the implementation of the CLARA tool (capacity, leadership, awareness, risk, and action) could prove beneficial:

1. **Capacity**—Initiate the first step by designing and implementing capacity-building programs to enhance knowledge of climate change issues and solutions. Numerous online courses, such as the WorkforClimate Academy, provide valuable resources.[15]

2. **Leadership**—Define leadership as "the process of influencing others to gain their willing consent in the ethical pursuit of missions." While command grants the authority to direct tasks, leadership is the human dimension of being a commander, inspiring subordinates to perform tasks. Climate leaders ensure that climate action and the necessary resources are integrated into all decision-making processes, emphasizing that leadership is a responsibility for everyone.

3. **Awareness**—Recognize that it is impossible to manage what one does not measure. Defense needs measurements to heighten awareness of climate issues and risks. Publish a standalone annual footprint of climate and sustainability performance (at base, service, and country levels), including individual ecological footprints, with independent verification of emissions.[16] The NATO methodology outlined below is a recommended approach.

[14] Edith Brown Weis and Vicki Arroyo, "Addressing Climate Change from the Bottom-Up in a Kaleidoscopic World," *Revue Européenne du Droit*, 2 (Spring 2021), https://geopolitique.eu/.

[15] "WorkforClimate Academy," WorkforClimate, 2022, https://www.workforclimate.org/.

[16] "Footprint Calculator," Global Footprint Network, 2023, https://www.footprintnetwork.org/.

4. **Risk and Resources**— Develop a straightforward climate risk assessment for individuals, units, bases, and communities. Projecting out to 2025 or 2030, allocate between 1 and 10 percent of your human, financial, and infrastructure resources to climate actions.
5. **Action**— Based on your risk assessment, focus on three actions: one for yourself now, one for your unit in the next 12 months, and one for the national defense force over the next five years. These actions should be positive and aimed at reducing risk.

Interestingly, the CLARA model aligns with NATO's Climate Change and Security Action Plan, encompassing awareness, adaptation, mitigation, and outreach.[17] This article recommends adopting the NATO (2023) Compendium of Best Practices and the NATO (2023) Greenhouse Gases Emission Mapping and Analytical Methodology as globally useful guidance and methodology for all defense forces to address the global problem of climate change.[18]

Influencing the Future

The global climate crisis can no longer afford the business-as-usual omission of the military from national accounts. Fortunately, cities, the private sector, and individuals are taking leadership measures to reduce emissions, advocate for low-carbon solutions, and exert pressure on governments at all levels to take action.[19] Some are even pursuing legal action against governments and fossil fuel companies. All these endeavors can be seen as bottom-up initiatives.

The envisioned future impacted by climate change is not inevitable. Many of the problems and solutions are currently known to us, and ongoing research continues to uncover new ones. Experts assert that there is still time to avert the most negative outcomes by limiting warming and swiftly reducing emissions to zero. Achieving a reduction in greenhouse gas emissions will necessitate investments in new technology and infrastructure, ultimately fostering job growth.

A sustainable planet, where citizens comprehend global climate impacts and actions, businesses take initiative, and decisive government regulations are implemented at the local level through communities, is crucial for our survival. Unfortunately, we have a long way to go for this dream to become a reality. Nevertheless,

[17] NATO "NATO Climate Change and Security Action Plan,"14 June 2021, https://www.nato.int/.

[18] NATO Climate Change and Security Action Plan, *Compendium of Best Practice* (Brussels: NATO, 2023), https://www.nato.int/; and Emerging Security Challenges Division, NATO, *The NATO Greenhouse Gases Emission Mapping and Analytical Methodology* (Brussels: NATO 2023), https://www.nato.int/.

[19] Hoyne, "Climate leadership."

every journey starts with the first step, every conversation starts with the first word, and every change in behavior commences with the first action.

Conclusion

Despite our best efforts to engage and collaborate with leaders in defense over a two-year period associated with the 2022 and 2023 Indo-Pacific Environment Security Forums, we encountered limited success due to a lack of information, competing priorities, insufficient resources, and a sense of urgency. Consequently, this thought piece did not benefit from insights into the latest global thinking. However, it was not constrained by business-as-usual, political considerations or greenwashing.

The objective of this article is to inform (and perhaps also to prompt introspection), inspire, and influence defense leaders to review, recognize, and measure their climate impacts at various scales and take swift measures to reduce them. Leveraging new technologies and clean energy approaches can provide operational benefits to militaries, enhancing their resilience and adaptability to twenty-first–century threats.[20] ✪

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[20] Leben and Yildiri, "Aggressive action required to meet Defence's ambitious emissions-reduction target"; and Michael Brzoska, "Climate change and the military in China, Russia, the United Kingdom, and the United States," *Bulletin of the Atomic Scientists* 68, no. 2 (2012) 43–54, https://doi.org/.