A Climate of Terror?

Part I: Approaches to the Study of Climate Change and Terrorism

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START
NATIONAL CONSORTIUM FOR THE
STUDY OF TERRORISM AND RESPONSES TO TERRORISM

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Reviews

▶ "A Climate of Terror? Climate Change as an Indirect Contributor to Terrorism," Madeline Romm.

▶ "A Climate of Terror? Climate Change as a Potential Ideological Driver of Terrorism," Marcus A. Boyd, Ph.D.

▶ "A Climate of Terror? Climate Change as a Means for Terrorist Exploitation," Samuel Henkin, Ph.D.

About START

The National Consortium for the Study of Terrorism and Responses to Terrorism (START) is a university-based research, education and training center comprised of an international network of scholars committed to the scientific study of terrorism, responses to terrorism and related phenomena. Led by the University of Maryland, START is a Department of Homeland Security Emeritus Center of Excellence that is supported by multiple federal agencies and departments. START uses state-of-the-art theories, methods and data from the social and behavioral sciences to improve understanding of the origins, dynamics and effects of terrorism; the effectiveness and impacts of counterterrorism and CVE; and other matters of global and national security. For more information, visit www.start.umd.edu or contact START at infostart@umd.edu.

About Pool Re

Pool Re's purpose is to enable the UK insurance market to offer terrorism cover to any commercial property that requires it. Central to the proposition is the integration of Pool Re's cover with the underlying property policy which ensures that there is no gap in the cover provided. Pool Re was designed to insulate the taxpayer from financial losses arising from acts of terrorism. It has achieved this effectively, to date paying £635m, £1.25bln when adjusted for inflation, in respect of 13 claims arising from certified terrorism events in the UK since our establishment. It has never called on the Government's guarantee. For more information, visit www.poolre.co.uk.

EXECUTIVE SUMMARY

Climate change is one of the most significant global issues of our time. In a recent United Nations Security Council Meeting, UN Secretary-General António Guterres stressed that "no one is safe from the destructive effects of climate disruption."[i] The ongoing gravity of stresses to the global climate system is increasingly understood as "unequivocal" and "unprecedented" as rapid and widespread climatic variability occurs.[ii] Moreover, accelerating rates of anthropogenic environmental change engender novel human security threats. Increased severity and frequency of natural disasters, land degradation, diminishing biodiversity, extreme weather, and many other environmental insecurities pose great societal risks. There is growing acknowledgment within the national security, research, and policy communities and among the private sector that climate change acts as a "threat multiplier."[iii] As a threat multiplier, climate change has the potential to exacerbate existing social, political, and economic tensions aggravating societal vulnerabilities. These tensions and vulnerabilities manifest in numerous and often unforeseen ways but can increase the likelihood of fragility and violent conflict in a given context.[iv]

The Climate-Security-Nexus

The complexity of the indirect and multidimensional links between climate change and security—the "climate-security-nexus"—has drawn specific attention to the need to better understand how climate change might cause conflict and what underlying conditions are present. Violent conflict is never mono-casual, and no direct causal link between climate change and violent conflict can be fully determined. Nevertheless, increasing evidence from around the world shows that climate change can exacerbate and compound risks known to contribute to insecurity factors that drive violent conflict.[v] The pathways through which violent conflict manifests in relation to climate change are highly contextual and determined by a range of interacting environmental, political, and socioeconomic factors and insecurities.

While significant attention is given to the complexities of the relations between climate change and violent conflict, less attention is paid to the ways climate change potentially fuels or aggravates enabling factors and drivers that set the stage for terrorism.[vi] As a starting point, our research explores how the interplay between climate change and terrorism is presented and understood in the wider research space. While there is little consensus on definitions of terrorism, we recognize terrorism, as a unique form of political violence.[vii] Moreover, terrorism is an extremely complex phenomenon, encompassing a multiplicity of groups with different origins, ideologies, and causes.

Terrorism and Climate Change?

Trends in terrorism produce greater uncertainty as the diversity and diffusion of violent extremism grow, including in online spaces. Likewise, the operational capacity of terrorist organizations has become more sophisticated while also facilitating increased violently rudimentary "lone-wolf" acts of terror.[viii] Terrorism is increasingly understood as part of a complex web of asymmetric systematic risks that constitute compounding threats to society.

Radicalization and recruitment to terroristic violence are widely acknowledged as a defining societal challenge. Furthermore, as climate change increasingly shapes contributing factors to vulnerability and fragility, shaping the life chances of billions, the possible conditions through which climate change and terrorism interact require greater examination: What are the environmental, political, and socioeconomic factors and insecurities that interact to constitute conditions for violence? To what degree are these interactions contributors to radicalization into violent extremism and terrorism? What potential does climate change have to exacerbate existing tensions, disrupt societal relationships, and create new threats exploited by terrorist organizations? To what degree can terrorist organizations exploit climate change stress points for coercive means to control or influence populations?

Research Directions

Underlying this series of Rapid Reviews is the understanding that research on the climate-security-nexus and the under-researched interactions between climate change and terrorism are "piecemeal" and have "generated limited understanding."[ix] The uncertainties that shroud both climate change and terrorism offer significant analytical challenges often resulting in quite speculative research. Linking climatic change to rare violent outcomes, like terrorism, is a highly involved endeavor. Although a corpus of empirical studies supports a link between climate change and violent conflict, others find no connection or a weak one.[x] The same is true of the limited number of empirical studies that examine climate change and terrorism.[xi] The contradictory nature of findings over the past decade of systematic research on the climate-security-nexus, including terrorism, should not be viewed as a failure of expert consensus but rather as a call for researchers to re-engage rigorous research design that takes into account the need for more sophisticated theoretical frameworks, methodological multiplicity, and contextually specific analysis.

Aided by advances in data type and availability, geo-referenced methods, and finer temporal resolution of climate data, researchers are now able to investigate potential contributing mechanisms in pathways of climate change to violence and terrorism, the conditions under which these emerge and are sustained, the various actors at play, and the range of possible outcomes in terms of conflictive (or cooperative) behavior.[xii] Additionally, as methodological rigor emerges in research on terrorism we are better positioned to address key questions: 1) how and 2) why do individuals join violent extremist organizations (VEOs) and 3) what motivates VEOs to commit terrorist acts.[xiii]

Thus, our capacity and capabilities for understanding the drivers of terrorism and anticipating new threats, compounded by climate change, continue to develop. Motivated by the call for more sophisticated theoretical models and methodologies the overall goal of this research agenda is to delve into three recognized climate change and terrorism interaction areas within research to map the state of present knowledge. Our findings are based on a synthesis of a vast corpus of literature,[xiv] which investigates both the climate-security-nexus and the following climate change and terrorism interaction areas:

- ► Climate change as an indirect contributor to terrorism;
- ► Climate change as an ideological driver of terrorism; and,
- ► Climate change as a means for terrorist exploitation to control or coerce populations.

These interaction areas are not mutually exclusive and the overlap across interaction areas is substantial. Although there have been fundamental issues raised and connections made in previous research on these interaction areas, we consider multiple pathways and feedback loops through which climatic phenomena may translate into violent social and political outcomes, specifically acts of terror.

Key Findings

As a result, select key findings include:

- ► While climate change may not be a direct 'root cause' of terrorism" it is recognized as a predominant destabilizing force that fosters an enabling environment for violent extremist organizations (VEOs).

- ► When regions are exposed to, or situated in, an environment susceptible to climate insecurities and are highly dependent on that environment for livelihoods, a positive correlational relationship between climate change and violence strengthens. This relationship may affect violent extremism as well and requires further analysis.

- ► During the 1990s and early 2000s the Earth Liberation Front (ELF) conducted a series of attacks that resulted in millions of dollars of property damage and serve as the foundation

for understanding climate change as a potential ideological driver of terrorism

- ▶ Neo-Luddites, the Anti-Technology Movement, and "eco-fascists" currently present the most significant concern due to their support for violence against humans and desire to destroy technology assets. However, the Covid-19 pandemic has caused disillusionment within mainstream environmentalist movements which may shape future ideological and tactical considerations.

- ▶ VEOs may exploit the effects of climate change as a means to exert influence over populations by exercising strategic tactics (capture, sabotage, and/or looting) to cause physical and economic harm to infrastructure and services or choose to strategically control such resources. The profitability of controlling essential resources may lead to more VEOs strategically capturing resources and their markets fully, or partially, and weaponizing them to support operational functions.

- ▶ VEOs may exploit weakened (real and perceived) government capacity and legitimacy to respond to climate change by fostering radicalization narratives of alienation and abandonment.

- ▶ VEOs may exploit individual and group grievances and insecurities exacerbated by climate change for recruitment into violent radicalization, including fostering narratives of marginalization, exclusion, and relative deprivation.

A Call to Action

With the growing frequency and intensity at which climate change occurs better understanding of its impacts on macro trends, meso factors, and micro drivers of insecurity matters, especially related to terrorism. Failure to meet the challenges posed by both climate change and terrorism has significant real-world consequences.

For future research, this series of Rapid Reviews offer a foundation and framing for which to test more specific relationships and hypotheses between climate change and terrorism. Conducting systematic empirical studies on the interactions between climate change and terrorism requires greater nuance in understanding the complexities of relational and mediating factors. Improved and innovative data collection, data integration, and data analysis are necessary to further investigate the ways climate change may exacerbate terrorism.

For members of IFTRIP, and the wider insurance industry, our findings offer relevant insights. Climate change is and will continue to be a key risk that will shape and impact the industry. The same can be said of the risk of terrorism. As risk experts, re/insurers have already taken notable actions to address climate change and terrorism. However, a more comprehensive and holistic approach to better understanding climate change and terrorism's mutual relations and interactions requires greater action.

RECOMMENDATIONS

- ▶ **Strengthen partnerships.** Stronger partnerships between the re/insurance sector, researchers responsible for better understanding climate change and violence risks, and governments tasked with the protection and well-being of citizens can facilitate better, more coordinated responses to climate change and its negative impacts. Additionally, the re/insurance sector should seek to partner with and support corollary forms of data collection and application. Strong partnerships are essential in filling knowledge gaps and pursuing evidence-informed policies and practices.

- ▶ **Improve Frameworks.** The re/insurance industry serves as an expert on risk management. As climate change increasingly becomes a systemic risk to global stability—compounding other major societal risks-- creating new frameworks that are risk-based and anticipatory is necessary to manage the potential

impacts of climate catastrophes and climate-related risks. Re/insurers already work with sophisticated tools related to natural catastrophes. Taking this into account, the integration of diverse data and methods can further improve risk modeling, such as multiple scenario analysis, providing meaningful and design-useful information and analysis for decision making.

▶ **Support Resilience Efforts.** The re/insurance industry is well-positioned to educate stakeholders and invest to support the transition to a more resilience-focused future. Risk awareness must be coupled with a better understanding of how societal and economic resilience plays a key role in alleviating the potential impacts of climate change catastrophes and political violence. The re/insurance industry can play a key role in building socioeconomic resilience to climate change risk from the beginning with the right partnerships, data and methods, and standards.

▶ **Set Standards.** There are several sources of uncertainty related to climate change and its impact on global economic stability. Collaborative and clear definitions and concept setting and transparent data on climate change and terrorism are necessary. To leverage the re/insurance industry's expertise in risk management to address climate change, standards must be set. Standards must be scalable and sustainable. A strong evidence base with scientific methodologies is needed for standards to be set to ensure a better impact on the economy. Both quantitative (near-term) and qualitative (long-term) assessments are useful in strategically setting and adopting standards.

▶ **Rescale Scope.** While climate change and terrorism are global phenomena, their severity and frequency are distributed unevenly. Therefore, the scope at which climate change and terrorism impact society must be responsive to varying scales of investigation over different time horizons. The re/insurance industry needs to take into account more frequent and less severe forms of climate-related acts of political violence (e.g., riots) and malicious activities (e.g., sabotage, selective damage, blockades). Creating more risk-specific guidance is essential to navigating evidence-informed decisions in risk management.

FUTURE STEPS

▶ **Promote Research.** IFTRIP, and the wider re/insurance industry, should promote and lead further research in this evolving area of interest and regularly update its findings.

▶ **Grow Expertise.** IFTRIP should focus on soliciting expertise and advice from experts (scientists, academia, policymakers, the private sector, and those in the re/insurance sector) in climate change and terrorism to broaden the knowledge and improve collaboration on the consequences of this existential threat on the drivers of terrorism utilizing START's consortium network.

▶ **Develop Action Plan.** IFTRIP, and the wider re/insurance industry, should utilize expertise in ongoing research efforts to develop an action plan moving forward in this topical area.

▶ **Explore Resilience.** The terrorism re/insurance industry should explore ways of improving its resilience to the systemic risks of climate change and how best to manage and mitigate this catastrophic tail risk.

▶ **Disseminate Findings.** The findings of this initial report should be shared with the leadership of COP26 along with any action plans developed.

▶ **Co-Fund Research.** Members of IFTRIP, and the wider global re/insurance industry, should be approached to co-fund the next stages of research.

i Guterres, António. 2021. "State of the Planet". Transcript of speech delivered at United Nations Security Council, NYC, December 2021.

ii IPCC, 2021: Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [Masson-Delmotte, V., P. Zhai, A. Pirani, S.L. Connors, C. Péan, S. Berger, N. Caud, Y. Chen, L. Goldfarb, M.I. Gomis, M. Huang, K. Leitzell, E. Lonnoy, J.B.R. Matthews, T.K. Maycock, T. Waterfield, O. Yelekçi, R. Yu, and B. Zhou (eds.)]. Cambridge University Press. In Press.

iii Gen Sullivan, Gordon R. USA (Ret), 2007. *National Security and the Threat of Climate Change.* Arlington, VA: CNA; Bryan, Joe, 2017. "Climate Change as a Threat Multiplier," *Atlantic Council*; Huntjens, Patrick and Nachbar, Katharina, 2015. "Climate Change as a Threat Multiplier for Human Disaster and Conflict," *Hague Institute for Global Justice*; and Middendorp, Tom and Bergema, Reinier, 2019. "Where Macro Meets Micro: How Climate Change Fuels Violent Extremism," *Global Observatory*, International Peace Institute.

iv Hsiang, Solomon M. and Burke, Marshall, 2013. "Climate, Conflict, and Social Stability: What Does the Evidence Say?," *Wiley Interdisciplinary Reviews: Climatic Change,* 123(1): 39–55; Buhaug, Halvard, 2015. "Climate–conflict research: some reflections on the way forward." *Wiley Interdisciplinary Reviews: Climate Change* 6(3): 269-275.

v See Barnett, Jon and Adger, W. Neil, 2007. "Climate Change, Human Security and Violent Conflict," *Political Geography* 26(6): 639–55; Buhaug, Halvard, Nils Petter Gleditsch, and Ole Magnus Theisen, "Implications of Climate Change for Armed Conflict," *Social Dimensions of Climate Change* 25 February 2008; Burke, Marshall, Hsiang, Solomon M., and Edward Miguel, 2015. "Climate and Conflict," *Annual Review of Economics* 7(1): 577–617; Nordås, Ragnhild and Gleditsch, Nils Petter*, 2007.* "Climate Change and Conflict," *Political Geography* 26(5): 627–38; Raleigh, Clionadh and Urdal, Henrik, 2007. "Climate Change, Environmental Degradation and Armed Conflict," *Political Geography* 26(6): 674-694.

vi Asaka, Jeremiah, 2021. "Climate Change - Terrorism Nexus? A Preliminary Review/Analysis of the Literature". *Perspectives on Terrorism*, 15 (1), 81-92; Somers, Scott, 2019. "How Terrorists Leverage Climate Change." *New Security Beat*, URL: https://www.newsecuritybeat.org/2019/09/terrorists-leverage-climate-change/; Telford, Andrew. 2020. "A Climate Terrorism Assemblage? Exploring the Politics of Climate-Terrorism-Radicalisation Relations." *Political Geography* 79: 102-150. Nett, Katharina and Rüttinger, Lukas, 2016. "Insurgency, terrorism and organised crime in a warming climate: Analysing the links between climate change and non-state armed groups". *Adelphi Climate Diplomacy Report*. Retrieved from https://www.adelphi.de/en/publication/insurgency-terrorism-and-organised-crime-warming-climate. Renard, Thomas, 2008. "Heated terror: Exploration of the possible impacts of climate change on the causes and the targets of terrorism". *Les Cahiers du RMES*, *5*(1): 15-53

vii Our working definitions of "terrorism" can be found in the glossary of terms in the Annex.

viii Spaaij, Ramón. 2010. "The enigma of lone wolf terrorism: An assessment." *Studies in Conflict & Terrorism* 33(9): 854-870; Spaaij, Ramón, and Hamm Mark S., 2015. "Key issues and research agendas in lone wolf terrorism." *Studies in Conflict & Terrorism* 38(3): 167-178,

ix Advisory Committee for Environmental Research and Education. 2021. "Environmental Change and Human Security Research Directions for the National Science Foundation". A Report of the NSF Advisory Committee for Environmental Research and Education. Prepared by the Environmental Change and Human Security Subcommittee.

x Salehyan, Idean. 2014. "Climate Change and Conflict: Making Sense of Disparate Findings." *Special Issue: Climate Change and Conflict* 43: 1–5; Selby, Jan, and Hoffmann, Clemens. 2014. "Rethinking Climate Change, Conflict and Security." *Geopolitics* 19(4): 747–56; IPCC, 2014. "Impacts, adaptation, and vulnerability." *Part A: Global and Sectoral Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change* 1132.

xi Asaka 2021

xii Buhag. Halvard. 2015. "Climate-conflict research: some reflections on the way forward," *WIREs Climate Change*, 6:269–275.

xiii Shuurman, Bart. 2019. "Topics in terrorism research: reviewing trends and gaps 2007-2016". *Critical Studies on Terrorism*, 12(3): 463-480.

xiv See Annexes for project methodology.

A Climate of Terror?

Climate Change as an Indirect Contributor to Terrorism

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STUDY OF TERRORISM AND RESPONSES TO TERRORISM

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SUMMARY

Research Questions

- In what ways can climate change serve as an indirect contributor to terrorism?

Key Insights and Findings

- While climate change may not be a direct 'root cause' of terrorism" it is recognized as a predominant destabilizing force that fosters an enabling environment for violent extremist organizations (VEOs).

- When communities or individuals lack the capacity to adopt alternative livelihoods and are exposed to increasing climate insecurity, affected communities or individuals may resort to illegal and illicit activities to generate income or feel the pull of VEOs' recruitment.

- When regions are exposed to, or situated in, an environment susceptible to climate insecurities and are highly dependent on that environment for livelihoods, a positive correlational relationship between climate change and violence strengthens. This relationship may affect violent extremism as well and requires further analysis.

- VEOs may exploit conflict and instabilities in receiving countries caused by migration and changes in mobility patterns due to diverse groups coming in contact with each other.

- VEOs capitalize on community and individual grievances as a result of perceived or actual subjective deterioration furthering their ideological agendas.
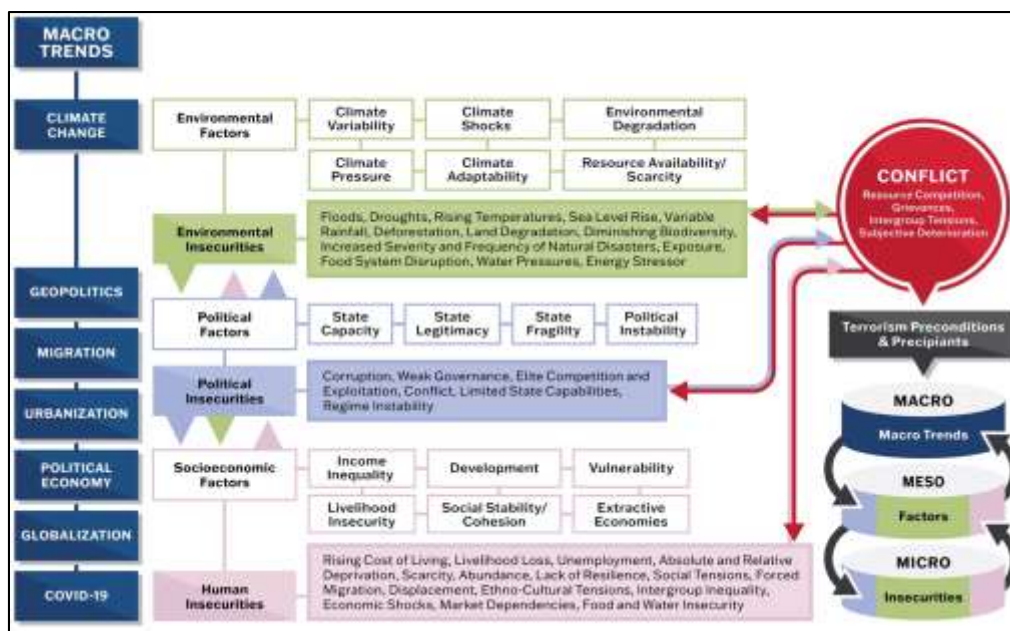
CONTENTS

Background

With growing concern over climate-related security consequences, researchers and policymakers are increasingly focused on the ways climate change may contribute to terrorism. While a direct causal link between climate change and terrorist activity is not clear, evidence suggests that the impacts of climate change assist in creating conditions that support conflict and violence, including acts of terror (Figure 1). This theoretical assertion is backed by a wealth of empirical and qualitative research on the climate-security-nexus and climate-conflict pathways studies.[1] Due to the paucity of direct research on climate-terrorism pathways, this rapid review examines four climate-conflict pathways in the evidence base that are relevant to understanding if, and how, climate and terrorism interact. It acknowledges that climate-conflict pathways research needs to disentangle different forms of conflict and political violence and advances an approach that can, in the future, identify causal mechanisms in a climate change-terrorism pathway.[2] While climate change may not be "a direct 'root cause' of terrorism" it is increasingly understood to be "an overarching destabilizing element that fosters the enabling environment for non-state actor terrorist groups."[3] In other words, climate change can be broadly understood as an *indirect contributor* to terrorism. To help explain and navigate the relationship between climate change and conflict, scholars have established four overarching and interconnected conceptual pathways.[4] Engaging the research on each pathway is valuable to the approach to better understanding the ways climate change may act as an indirect contributor to terrorism. The pathways are as follows:

- ▶ Worsening livelihood conditions,
- ▶ Migration and mobility patterns,
- ▶ Exploitation by elites and resources mismanagement, and
- ▶ Tactical considerations by violent non-state actors.

Figure 1: Climate-Security-Nexus Concept Map

Macro Trends: Refers to pervasive and persistent global phenomena that act as forces of change impacting current environmental and human systems operations.

Factors: Refers to forces, processes, and phenomena that produce and shape, and are shaped by, connections between macro trends and insecurities of current environmental and human systems operations.

Insecurities: Refers to forces, processes, and phenomena that threaten everyday life chances increasing vulnerabilities in current environmental and human systems operations

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[1] Lukas Rüttinger et al., 'A New Climate for Peace: Taking Action on Climate and Fragility Risks', 2015; Vally Koubi, 'Climate Change and Conflict', *Annual Review of Political Science* 22, no. 1 (2019): 343–60; Malin Mobjörk, Florian Krampe, and Kheira Tarif, 'Pathways of Climate Insecurity: Guidance for Policymakers' (SIPRI, November 2020).

[2] Tim Sweijis, Marleen de Hann, and Hugo van Manen. 2022. Unpacking the Climate Security Nexus: Seven Pathologies Linking Climate Change to Violent Conflict. The Hauge Centre for Strategic Studies.

[3] Paul J. Smith, "Climate Change, Weak States and the 'War on Terrorism' in South and Southeast Asia," *Contemporary Southeast Asia* 29, no. 2 (August 2007): 272, https://doi.org/10.1355/CS29-2C.

[4] Sebastian van Baalen and Malin Mobjörk, "Climate Change and Violent Conflict in East Africa: Integrating Qualitative and Quantitative Research to Probe the Mechanisms," *International Studies Review* 20, no. 4 (December 1, 2018): 547–75, https://doi.org/10.1093/isr/vix043.

The four specific pathways listed above demonstrate how and under what conditions climate shocks, pressures, and variability may create environments that foster terrorist activity. Again, these pathways do not imply mono-casual or direct routes to violent conflict but rather offer evidence to support how the impacts of climate change may create enabling environments for radicalization to violent extremism and terrorism (See Rapid Review #3).

Evidence Review
Worsening Livelihood Conditions

When investigating the climate change-conflict relationship, examining a state's resiliency and its ability to adapt to climate-related impacts highly influences whether violence is an outcome or not and it is important to note that a region's resiliency is highly dependent on existing political, economic, and social conditions and factors.[5] To adequately and appropriately track a possible pathway from climate change to conflict it is valuable to examine how and if climate insecurities result in the worsening of livelihoods.[6] Evidence suggests that climate change produces environments where community's livelihoods are and will increasingly be less feasible. If a region lacks livelihood resilience, where vulnerabilities challenge the ability to change livelihoods as an adaption strategy, the risk of conflict increases.[7]

Livelihood insecurity is especially salient in weak or fragile states that are already suffering from a range of existing vulnerabilities. Climate change indirectly influences conflict, where it amplifies or compounds pre-existing economic, social, and political insecurities that are known contributors to violence.[8] Those most vulnerable include communities that are reliant on farming and agriculture as a means of survival. Specifically, the livelihoods in these regions are determined by the climate, their resources, and their minimal capacity to respond to climate pressures.[9] In other words, when regions are highly dependent on natural resources as a source of income and essential provisions and lack the capability to respond to climate-related consequences, their livelihoods are more extremely impacted by climate change. Climate shocks, such as droughts and floods, and climate variabilities, like soil degradation and desertification, can have detrimental effects in these communities where climate-related disasters can decrease the availability of natural resources, including water, land, livestock, and crops.[10]

> *Climate change is "an overarching destabilizing element that fosters the enabling environment for non-state actor terrorist groups"*

Weak states that are susceptible to climate pressures are likely to encounter food and water insecurity, which can increase the risk of conflict.[11] Lack of resources can influence individuals' and groups' utilization of violence to protect or acquire remaining resources (i.e. resource competition).[12] Regions that are reliant on renewable natural resources may resort to communal conflict in response to the loss of outputs as a means to protect and/or access existing resources. As resources become more scarce, groups will compete for what remains.[13] Furthermore, with dwindling resources and population growth,

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[5] Andrea S Downing et al., "MANAGING CLIMATE RELATED SECURITY & DEVELOPMENT RISKS IN THE ANTHROPOCENE," n.d., 11.

[6] Dr Malin Mobjörk, "Pathways of Climate Insecurity: Guidance for Policymakers," n.d., 12.

[7] Carl Folke et al., "Resilience and Sustainable Development: Building Adaptive Capacity in a World of Transformations," *AMBIO: A Journal of the Human Environment* 31, no. 5 (August 2002): 437–40, https://doi.org/10.1579/0044-7447-31.5.437.

[8] Tarek Ghani and Robert Malley, "Climate Change Doesn't Have to Stoke Conflict," November 1, 2021, https://www.foreignaffairs.com/articles/ethiopia/2020-09-28/climate-change-doesnt-have-stoke-conflict.

[9] Smith, "Climate Change, Weak States and the 'War on Terrorism' in South and Southeast Asia."

[10] van Baalen and Mobjörk, "Climate Change and Violent Conflict in East Africa."

[11] Philippe Vitel, "CLIMATE CHANGE, INTERNATIONAL SECURITY AND THE WAY TO PARIS 2015," n.d., 15.

[12] Mobjörk, "Pathways of Climate Insecurity: Guidance for Policymakers."

[13] Sonja Ayeb-Karlsson et al., "A People-centred Perspective on Climate Change, Environmental Stress, and Livelihood Resilience in Bangladesh," *Sustainability Science* 11, no. 4 (July 2016): 679–94, https://doi.org/10.1007/s11625-016-0379-z.

groups with power collect surviving resources and shift the distribution, resulting in increased grievances towards elite groups (see elite pathway below).[14] As a result, VEOs can take advantage of increased grievances and growing inequalities.[15] For example, in East Africa, agricultural and pastoral communities heavily reliant on rainfall patterns are witnessing observable increases in communal and rebel conflicts occurring during periods of heavy rainfall.[16]

Of particular concern, climate pressures can damage (housing) infrastructure, farming, and agriculture, which can negatively impact employment and income.[17] Effects are especially detrimental when communities do not have the capacity to adopt alternative livelihoods. Affected groups may resort to illegal activities and/or join violent armed groups, including VEOs, to generate income if legal employment is no longer available.[18] For example, in Indonesia, piracy-related activities noticeably increased after observable decreases in revenue generated from fishing.[19] Oceanographic climate variation will influence the amount of fish caught and/or the number of feasible fishing trips. Furthermore, climate shocks, such as the 2011 typhoon in Indonesia, move fishermen closer to shore, further affecting the success of their trips. The decrease in legal income opportunities and the economy's reliance on the fishing industry factor into piracy as a viable adaptation strategy among fishermen.[20] Whether or not this type of violent adaptation strategy is viable in a climate change-terrorism pathway needs further investigation.

> *"As support for non-state violent groups increases and human securities are threatened, climate-change responses are further challenged, and the risk of terrorist activity and organized crime is heightened."*

In another example, pastoralists in Kenya, that have lost income due to climate-related environmental changes are participating in violent activities, such as livestock raiding to adapt to their new circumstances. During dry months in the Turkana district, livestock raids tend to increase as pastoralists compete over limited resources and land.[21] When interviewed, raiders revealed that mutual cooperation was no longer beneficial as their livelihood was compromised.[22] Non-state actors can encourage local conflicts to strategically exacerbate instability and further weaken states. This grants non-state actors, like VEOs, the opportunity, and space to gain power, boost recruitment, and, ultimately, further their agenda.[23] Worsening livelihood conditions, including the lack of resources and employment opportunities, decreases the cost of engaging in violence.[24] As support for non-state violent groups increases and human securities are

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[14] Thomas F. Homer-Dixon, "Environmental Scarcities and Violent Conflict: Evidence from Cases," *International Security* 19, no. 1 (1994): 5, https://doi.org/10.2307/2539147.

[15] Par Thomas Renard, "Heated Terror: Exploration of the Possible Impacts of Climate Change on the Causes and the Targets of Terrorism," n.d., 40.

[16] Clionadh Raleigh and Dominic Kniveton, "Come Rain or Shine: An Analysis of Conflict and Climate Variability in East Africa," *Journal of Peace Research* 49, no. 1 (January 2012): 51–64, https://doi.org/10.1177/0022343311427754.

[17] Sabine L. Perch-Nielsen, Michèle B. Bättig, and Dieter Imboden, "Exploring the Link between Climate Change and Migration," *Climatic Change* 91, no. 3–4 (December 2008): 375–93, https://doi.org/10.1007/s10584-008-9416-y.

[18] Pernilla Nordqvist and Florian Krampe, "Climate Change and Violent Conflict: Sparse Evidence from South Asia and South East Asia," n.d., 12.

[19] Sebastian Axbard, "Income Opportunities and Sea Piracy in Indonesia: Evidence from Satellite Data," *American Economic Journal: Applied Economics* 8, no. 2 (April 1, 2016): 154–94, https://doi.org/10.1257/app.20140404.

[20] Axbard, 155.

[21] Carol R. Ember et al., "Rain and Raids Revisited: Disaggregating Ethnic Group Livestock Raiding in the Ethiopian-Kenyan Border Region," *Civil Wars* 16, no. 3 (July 3, 2014): 300–327, https://doi.org/10.1080/13698249.2014.966430.

[22] Jürgen Scheffran et al., "Climate Change and Violent Conflict," *Science* 336, no. 6083 (May 18, 2012): 869–71, https://doi.org/10.1126/science.1221339.

[23] Kumar Ramakrishna, "Delegitimizing Global Jihadi Ideology in Southeast Asia," *Contemporary Southeast Asia* 27, no. 3 (December 2005): 343–69, https://doi.org/10.1355/CS27-3A; Nordqvist and Krampe, "Climate Change and Violent Conflict: Sparse Evidence from South Asia and South East Asia"; Jan Selby et al., "Climate Change and the Syrian Civil War Revisited," *Political Geography* 60 (September 2017): 232–44, https://doi.org/10.1016/j.polgeo.2017.05.007.

[24] Homer-Dixon, "Environmental Scarcities and Violent Conflict"; Jon Barnett and W. Neil Adger, "Climate Change, Human Security and Violent Conflict," *Political Geography* 26, no. 6 (August 2007): 639–55, https://doi.org/10.1016/j.polgeo.2007.03.003.

threatened, climate-change responses are further challenged and the risk of terrorist activity and organized crime is potentially heightened.

In addition to a lack of resources and employment, regions that lack governance capacity or capability to address climate change face an increased risk of conflict. While social, political, and economic inequalities are contributing factors to violence by themselves, climate change multiplies these threats.[25] For instance, climate shocks can reduce a government's ability to function in and be resilient to, emergency situations.[26] Specifically, in weak states that have heightened vulnerability, climate shocks create an additional strain for governments by introducing new financial burdens, increased human insecurity risks, and operational challenges. Alongside normal government functions, their response capabilities are affected by climate pressures, destroyed infrastructure, and inadequate basic safety measures resulting in diminished trust and support in the government.[27] When governments lack the capacity to respond to climate-related consequences, likely due to pre-existing vulnerabilities, it can aid in state failure.[28] As climate shocks, pressures, and variability become more frequent and intense, weak state infrastructure will be continually challenged, thus worsening the livelihoods of those affected.[29] As mentioned though, conflict is not an absolute result of climate pressures. Rather, a region or group's adaptive capacity is a key mechanism in mitigating the climate change-conflict pathway.[30]

Existing vulnerabilities, fragile coping strategies, and capabilities that influence worsening livelihood conditions are determined by different social, political, and economic factors including history of violence and forced migration, marginalization, the strength of government legitimacy, level of dependence on renewable natural resources, and previous environmental impacts.[31] Researchers examine how exposure, vulnerabilities, and coping capacities interact together finding that many low-income countries residing in tropical zones are becoming warmer due to climate change, thus negatively impacting and limiting their agricultural outputs.[32] Their exposure to the equatorial climate and their pre-existing socio-economic status make them more vulnerable to climate-related impacts.

Livelihood insecurity, as a result of climate change, has the potential to create environments that foster varying forms of terrorist activity. When affected groups are not resilient and cannot adapt, the risk of conflict and violence increases. Further, climate shocks and variability will have a disproportionate impact on poorer, developing countries. Climate-related disasters will compound existing vulnerabilities further exacerbating other vulnerabilities like a lack of adequate governmental response.[33] Meanwhile, those capable will "adapt and recover from such environmental stress by modifying their agricultural practices, switching to alternative livelihoods, or using migration as an adaptive strategy."[34] However, it is possible

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[25] Mobjörk, "Pathways of Climate Insecurity: Guidance for Policymakers"; Smith, "Climate Change, Weak States and the 'War on Terrorism' in South and Southeast Asia."

[26] Homer-Dixon, "Environmental Scarcities and Violent Conflict"; Raleigh and Kniveton, "Come Rain or Shine."

[27] "Climate Security Mechanism," accessed April 1, 2022, https://dppa.un.org/sites/default/files/csm_toolbox-1-briefing_note.pdf.

[28] Amar Causevic, "Facing an Unpredictable Threat: Is NATO Ideally Placed to Manage Climate Change as a Non-Traditional Threat Multiplier?," *Connections: The Quarterly Journal* 16, no. 2 (2017): 59–80, https://doi.org/10.11610/Connections.16.2.04.

[29] Jouni Paavola, "Livelihoods, Vulnerability and Adaptation to Climate Change in Morogoro, Tanzania," *Environmental Science & Policy* 11, no. 7 (November 2008): 642–54, https://doi.org/10.1016/j.envsci.2008.06.002; Jeeban Panthi et al., "Livelihood Vulnerability Approach to Assessing Climate Change Impacts on Mixed Agro-Livestock Smallholders around the Gandaki River Basin in Nepal," *Regional Environmental Change* 16, no. 4 (April 2016): 1121–32, https://doi.org/10.1007/s10113-015-0833-y; Hassnain Shah, Petra Hellegers, and Christian Siderius, "Climate Risk to Agriculture: A Synthesis to Define Different Types of Critical Moments," *Climate Risk Management* 34 (2021): 100378, https://doi.org/10.1016/j.crm.2021.100378.

[30] Ayeb-Karlsson et al., "A People- centred Perspective on Climate Change, Environmental Stress, and Livelihood Resilience in Bangladesh."

[31] van Baalen and Mobjörk, "Climate Change and Violent Conflict in East Africa."

[32] Causevic, "Facing an Unpredictable Threat."

[33] Smith, "Climate Change, Weak States and the 'War on Terrorism' in South and Southeast Asia."

[34] Ayeb-Karlsson et al., "A People- centred Perspective on Climate Change, Environmental Stress, and Livelihood Resilience in Bangladesh," 679.

that climate change's impact on less developed and developing countries may create a ripple effect for developed countries as well. This possibility needs to be further examined.

Figure 2: Livelihood Insecurity Pathway
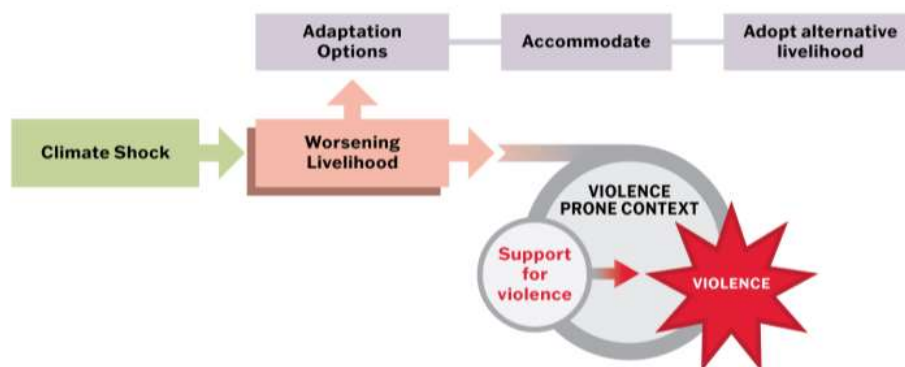
Increasing Migration and Changing Mobility Patterns

The second climate-conflict pathway that informs the climate change-security-nexus is related to environmentally induced migration and climate-related changing mobility patterns. Migration is an adaptation strategy for those with worsening livelihoods, lack of access to necessary resources, the capabilities shift to alternative livelihoods, and/or the increased impacts of climate change.[35] Whether is it a short-term or long-term strategy, migration affords a chance to search for areas that present more viable economic, social, and political opportunities.[36]

Following devastating climate shocks, exposed and vulnerable populations will often choose or are often forced to migrate. Several environmental, economic, and socioeconomic push and pull factors contribute to an individual's motivations or necessity to migrate.[37] Worsening livelihood conditions act as push factors in the decision to migrate, and the promise of improved livelihoods, including viable employment, safety, family unification, stability, and favorable immigration policies, are pull factors that influence migration into a particular region.[38]

Populations that "use migration to deal with permanent loss of livelihood…[or] help overcome temporary livelihood insecurities" are largely resource-dependent populations and those experiencing livelihood insecurity.[39] Less developed countries are particularly at risk because climate-related disasters can compound already existing vulnerabilities. With added stressors to a state's infrastructure, government capacity to support modifying livelihoods as an adaptation strategy are generally not feasible.[40]

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[35] Mobjörk, "Pathways of Climate Insecurity: Guidance for Policymakers"; Ayeb-Karlsson et al., "A People-centred Perspective on Climate Change, Environmental Stress, and Livelihood Resilience in Bangladesh."

[36] Raleigh and Kniveton, "Come Rain or Shine"; Ayeb-Karlsson et al., "A People- centred Perspective on Climate Change, Environmental Stress, and Livelihood Resilience in Bangladesh"; Richard Black et al., "Migration as Adaptation," *Nature* 478, no. 7370 (October 2011): 447–49, https://doi.org/10.1038/478477a; Barnett and Adger, "Climate Change, Human Security and Violent Conflict."

[37] Satchit Balsari, Caleb Dresser, and Jennifer Leaning, "Climate Change, Migration, and Civil Strife," *Current Environmental Health Reports* 7, no. 4 (December 2020): 404–14, https://doi.org/10.1007/s40572-020-00291-4; Ayeb-Karlsson et al., "A People- centred Perspective on Climate Change, Environmental Stress, and Livelihood Resilience in Bangladesh."

[38] L. Perch-Nielsen, B. Bättig, and Imboden, "Exploring the Link between Climate Change and Migration"; Reuveny, "Climate Change-Induced Migration and Violent Conflict."; Reuveny, "Climate Change-Induced Migration and Violent Conflict."

[39] Ayeb-Karlsson et al., "A People- centred Perspective on Climate Change, Environmental Stress, and Livelihood Resilience in Bangladesh," 689.

[40] Reuveny, "Climate Change-Induced Migration and Violent Conflict."

Thus, populations will look to migrate to resource-rich environments that provide new employment opportunities and perceived safety, oftentimes to urban areas.[41] In fact, climate change has increased rural-urban migration at an increasingly quick pace as a result of the loss of economic opportunities in rural areas. Urban areas can offer opportunistic livelihoods for rural communities but also sustain a significant level of inequality.[42] Consequently, rural-urban migration may induce high marginalization in host regions which may prompt communal conflict and increased grievances if states cannot adequately respond to an influx of migrants.[43] Growing urbanization, due to climate change, invites terrorist activities given the unstable environment following a large migration (See Rapid Review #2 and #3).[44]

Ultimately, Climate shocks that cause infrastructure damage and diminish or decimate natural resources can result in economic insecurities, like loss of income and economic decline, that drive migration.[45] For instance, mass migration from Bangladesh to India occurred after suffering decades of land degradation and erosion and water and food scarcity that was further exacerbated by several climate shocks. When livelihood and adaptation strategies failed, 12 - 17 million Bangladeshis migrated to India, and a million were internally displaced.[46]

> *"Migrating for economic opportunities will be more common for populations that are dependent on agriculture and farming in less developed countries that struggle to overcome climate-related disasters".*

According to past research, there are four overarching factors that influence the relationship between migration and conflict:

▶ **Competition:** Competition occurs when the arrival of migrants overwhelms the supply of renewable natural resources. This is likely in situations of high levels of migration and/or the receiving areas are less developed and resource-dependent regions themselves. Oftentimes, an influx of migrants can overwhelm the availability of resources.[47]

▶ **Ethnic tension:** Conflict is a more likely outcome when migrants and host residents belong to different social or ethnic groups. When environmental impacts influence decisions to migrate, populations of differing religious and ethnic backgrounds are forced to interact, which may increase social tensions.[48] Migration, particularly in vulnerable regions, can influence livelihood insecurity within the receiving state, thus provoking internal conflict.[49] Interestingly, the research found that a majority of intra-state migrations did not result in conflict.

▶ **Distrust:** Feelings of distrust may arise as a result of climate-induced migration. Distrust is often related to social and ethnic tensions amongst populations now competing for reduced resources (like land and water). Opposed groups will likely develop a sense of skepticism as tensions rise.[50]

[41] Kanta Kumari Rigaud et al., "DEEP DIVE INTO INTERNAL CLIMATE MIGRATION IN TANZANIA," n.d., 120.
[42] Rigaud et al.
[43] Renard, "Heated Terror: Exploration of the Possible Impacts of Climate Change on the Causes and the Targets of Terrorism."
[44] Renard.
[45] L. Perch-Nielsen, B. Bättig, and Imboden, "Exploring the Link between Climate Change and Migration."
[46] Reuveny.
[47] Reuveny.
[48] Mobjörk, "Pathways of Climate Insecurity: Guidance for Policymakers."
[49] Rigaud et al., "DEEP DIVE INTO INTERNAL CLIMATE MIGRATION IN TANZANIA."
[50] Reuveny, "Climate Change-Induced Migration and Violent Conflict."

▶ **Fault lines:** Conflict may ensue over socioeconomic and/or rural to urban fault lines. Fault lines are specific attributes that subdivide groups.[51] As climate change drives migration, more diverse groups come into contact, increasing the potential for divisiveness and, potentially conflict.[52]

The four factors together with auxiliary conditions, including less developed economies, exposure to environmental disasters, dependence on natural renewable resources, history of conflict, and the infrastructure to manage in-migration, may increase the risk of conflict.[53]

It is important to note that while climate shocks commonly prompt immediate migration, climate variability occurs over time, making it difficult to predict and measure.[54] Very little empirical research has explored the relationship between climate variability, migration patterns, and violence. A majority of the literature focuses on short-term impacts of climate change, therefore ignoring the risk of violence over a long period of time and often explained away by factors outside of climate change.[55] Overall, while many scholars theorize that climate change-induced migration increases the risk of violence, this pathway lacks verifiable evidence and is shrouded in unknowns. However, migration and mobility patterns have in the past played a critical role in violent outbreaks and this may be an exploitable area for VEOs (See Rapid Review #3).[56]

Figure 3: Migration and Mobility Pathway
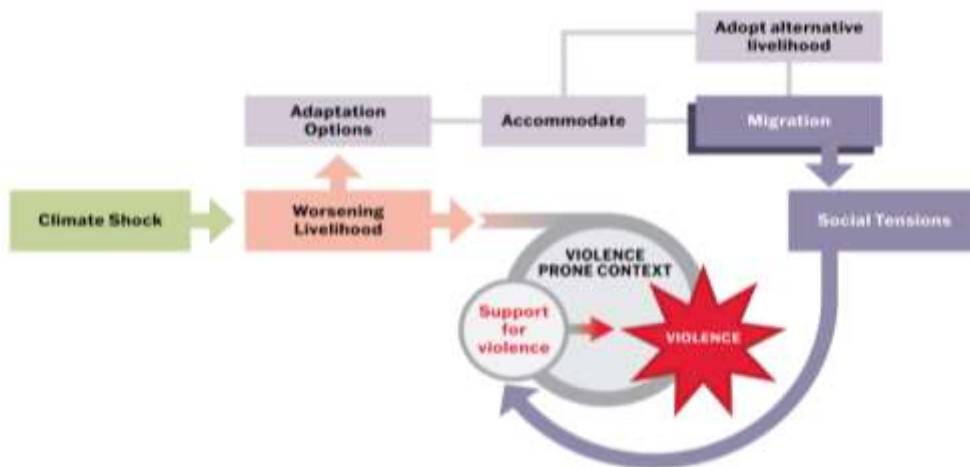
Exploitation by Elites and Resource Management

The third climate-conflict pathway of relevance is related to elite exploitation and elite mismanagement of resources. A region experiencing climate change invites elites, who often control essential resources and markets, to exploit existing instability created by climate shocks and pressures to serve their interests, often at the expense of others.[57] Evidence suggests that climate insecurities can engender and foster

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[51] Dora C. Lau and J. Keith Murnighan, "Demographic Diversity and Faultlines: The Compositional Dynamics of Organizational Groups," *The Academy of Management Review* 23, no. 2 (April 1998): 325, https://doi.org/10.2307/259377.
[52] Reuveny, "Climate Change-Induced Migration and Violent Conflict."
[53] Reuveny; Balsari, Dresser, and Leaning, "Climate Change, Migration, and Civil Strife."
[54] van Baalen and Mobjörk, "Climate Change and Violent Conflict in East Africa."
[55] Mobjörk, "Pathways of Climate Insecurity: Guidance for Policymakers."
[56] Reuveny, "Climate Change-Induced Migration and Violent Conflict."
[57] van Baalen and Mobjörk, "Climate Change and Violent Conflict in East Africa."

grievances, towards the state or out-groups allowing elites to capitalize on formed grievances to further personal agendas, often for profit.[58]

In particular, this pathway can be understood through marginalized groups' feelings of absolute and relative deprivation following climate shocks and pressures and how these feelings manifest themselves into grievances. When elites exploit environmental, political, and socioeconomic insecurities that result from climate change, it can provoke feelings of relative and absolute deprivation within marginalized populations.

> ▶ **Absolute deprivation** emerges when groups lack the basic necessities to survive, while
> ▶ **Relative deprivation** occurs when there is a gap between expected livelihood experience and reality.[59]

Grievances towards other social groups, especially outgroups, or inter-group grievances, are more likely produced by a sense of relative deprivation. Feelings of relative deprivation are likely to arise when elites' lives improve, while marginalized populations' livelihoods decline.

Elites also form connections with government representatives to establish legitimacy for controlling resource distribution.[60] For example, grievances among Muslims in Xinjiang Province in China developed when the government facilitated irrigation and agricultural upgrades strategically in areas where Han Chinese immigrants resided, fueling feelings of relative deprivation.[61] Distributing limited resources to powerful or in-favor groups exclusively perpetuates existing poverty and environmental damage.[62]

"While small-scale conflicts are often the outcome of climate shocks, state elites play a critical role in that pathway from local conflicts to large-scale violence."

Grievances towards the government, or anti-state grievances, materialize when the government lacks the capacity and capability to alleviate the impacts of climate change. Anti-state grievances likely exacerbate absolute or relative deprivation as weak governance cannot address or remedy the negative consequences of climate change. Groups resent the government for not only fostering an environment where elites overwhelmingly succeed but also failing to provide affected populations with basic needs. Anti-state grievances can undermine the legitimacy of the government. Thus, state elites are motivated to grow and secure their own support system, while weakening their opposition.[63] To distract from their inability to effectively and efficiently address climate-related consequences, state elites often exploit existing tensions and political discord by encouraging inter-group conflict.[64] Therefore, individuals channel their grievances towards other social groups rather than the regime. Demonstrated in Kenya in the 1990s, the Moi regime instigated ethnic violence to undermine the call for democracy. The government worked along Moi to exacerbate existing land grievances, cause group conflict, and safeguard the government's power.[65]

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[58] Colin H. Kahl, "Population Growth, Environmental Degradation, and State-Sponsored Violence: The Case of Kenya, 1991-93," *International Security* 23, no. 2 (1998): 80–119, https://doi.org/10.2307/2539380.

[59] Edward Anderson and Lucio Esposito, "On the Joint Evaluation of Absolute and Relative Deprivation," *The Journal of Economic Inequality* 12, no. 3 (September 2014): 411–28, https://doi.org/10.1007/s10888-013-9262-7.

[60] van Baalen and Mobjörk, "Climate Change and Violent Conflict in East Africa"; Stathis N. Kalyvas, *The Logic of Violence in Civil War* (Cambridge: Cambridge University Press, 2006), https://doi.org/10.1017/CBO9780511818462.

[61] Kahl, "Population Growth, Environmental Degradation, and State-Sponsored Violence."

[62] Homer-Dixon, "Environmental Scarcities and Violent Conflict."

[63] V. P. Gagnon, "Ethnic Nationalism and International Conflict: The Case of Serbia," *International Security* 19, no. 3 (1994): 130, https://doi.org/10.2307/2539081.

[64] Kahl, "Population Growth, Environmental Degradation, and State-Sponsored Violence."

[65] Kahl.

When the government's power is threatened, state elites may strategically incite inter-group violence to undermine their opponents and validate their legitimacy. Although local, small-scale conflicts tend to be a consequence of climate shocks and pressures,[66] communal conflicts can escalate into large-scale violence through elite manipulation. Specifically, elites can exploit existing inter-group grievances and use them to recruit individuals to support violence.[67] For example, elite exploitation of grievances is demonstrated by Rezaigat camel nomads in Darfur who, before the droughts in the 70s and 80s, had mutually benefiting relationships with local farmers.[68] The negative impacts of droughts led to local land disputes and provoked grievances among farmers and the Rezaigat. Grievances soon escalated to large-scale violence when the government capitalized on the Rexaigat's grievances towards local groups and recruited them to enact violence.[69]

Climate shocks that highly impact environmental security can create environments that invite elite exploitation. Feelings of relative and absolute deprivation influence grievances towards social groups and state elites. While small-scale conflicts are often the outcome of climate shocks, state elites play a critical role in the pathway from local conflicts to large-scale violence.[70] Through existing tensions or inciting communal conflict, state elites have mobilized vulnerable individuals into conflict. How this relates to VEOs ability to exploit vulnerable individuals as well as an important future area of research.

Figure 4: Elite Exploitation Pathway
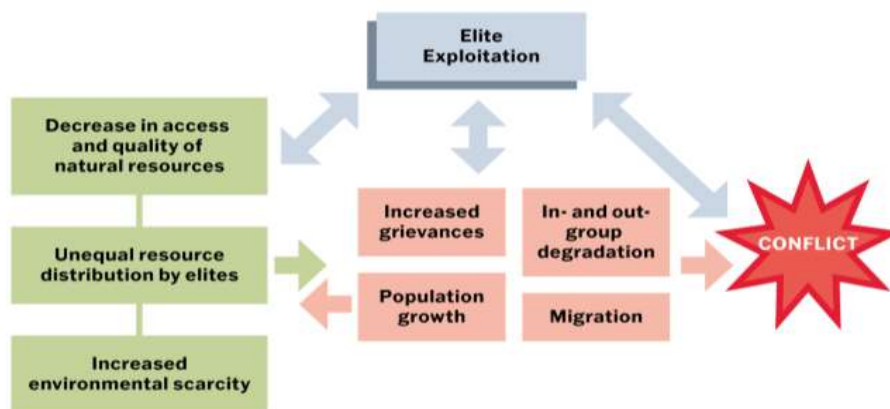
Tactical Considerations by Violent Non-State Actors

Contrary to the previous pathways that track how climate-related consequences may result in a heightened risk of violence, the third pathway which considers tactical considerations by violent non-state actors examines how climate pressures and variability creates an environment that may facilitate actual terrorist activity as a unique form of political violence[71]. It is important to note that this pathway is not deterministic, and, at times, climate shocks and pressures have been known to decrease violent non-state actors' presence. Other factors such as location, the strength of the military, governmental strength,

[66] Halvard Buhaug, "Climate–Conflict Research: Some Reflections on the Way Forward," *WIREs Climate Change* 6, no. 3 (May 2015): 269–75, https://doi.org/10.1002/wcc.336.
[67] Mobjörk, "Pathways of Climate Insecurity: Guidance for Policymakers."
[68] Adam Mohammed, "The Rezaigat Camel Nomads of the Darfur Region of Western Sudan: From Co-Operation to Confrontation," *Nomadic Peoples* 8, no. 2 (December 1, 2004): 233, https://doi.org/10.3167/082279404780446087.
[69] Mohammed, "The Rezaigat Camel Nomads of the Darfur Region of Western Sudan."
[70] Buhaug, "Climate–Conflict Research."
[71] van Baalen and Mobjörk, "Climate Change and Violent Conflict in East Africa."

and available resources will determine a violent non-state actor's activity in a region.[72] Nevertheless, according to scholars, climate change impacts can influence violent non-state actors' tactical decisions in three broad ways:[73]

- ▶ Controlling resource distribution:
- ▶ Recruitment strategies
- ▶ Adopting "opportunistic behavior"

Controlling Resource Distribution

Similar to elite groups, violent non-state actors exploit vulnerabilities to control natural resources and ensure livelihood security for their members when climate shocks and variabilities reduce or destroy natural resources.[74] Whether it be land, water, or food scarcity, violent non-state actors will alter their strategies to acquire surviving resources after a climate shock.[75] Moreover, scarcity justifies the use of violence by violent non-state actors in accomplishing their goals.[76] For instance, climate shocks that affect agricultural production invite intimidation by violent non-state actors who often do not produce their own food but depend on intentional or forced contributions from populations.[77]

Following severe droughts that affect agricultural outputs, violent non-state actors have been known to participate in land grabbing as a means to secure and control natural resources. Violence is most often used or escalated when violent non-state actors do not mutually benefit or cooperate with inhabitants.[78] Violent non-state actors, such as Al Shabaab, Naxalite rebels, and Barisan Revolusi Nasional-Coordinate (BRN-C) rebels, have all used violent tactics, including terrorism, to ensure their access to resources. After a drought in 2011, Al Shabaab violently captured food supplies from local communities.[79] Similarly, during a 2004 drought, farmers in Songkhla province, Thailand hoarded rice to keep it out of the hands of the BRN-C. In response, BRN-C resorted to violence to push local farmers off their rice farms and took the remaining rice to establish food security.[80] These acts of violence committed by non-state violent actors were not only to ensure food security but instill fear.[81]

Recruitment Strategies

Along with controlling resource distribution, violent non-state actors may exploit stressors created by climate change to encourage recruitment (see rapid review #3). Evidence suggests that deteriorating livelihoods from climate-related impacts make individuals susceptible to recruitment by violent non-state actors.[82] When climate change significantly affects resource-dependent livelihoods, individuals may turn

[72] Mobjörk, "Pathways of Climate Insecurity: Guidance for Policymakers," 6.
[73] Nordqvist and Krampe, "Climate Change and Violent Conflict: Sparse Evidence from South Asia and South East Asia."
[74] Nordqvist and Krampe.
[75] Mobjörk, "Pathways of Climate Insecurity: Guidance for Policymakers."
[76] Benjamin E. Bagozzi, Ore Koren, and Bumba Mukherjee, "Droughts, Land Appropriation, and Rebel Violence in the Developing World," *The Journal of Politics* 79, no. 3 (July 2017): 1057–72, https://doi.org/10.1086/691057.
[77] Henk-Jan Brinkman and Cullen S Hendrix, "Food Insecurity and Violent Conflict: Causes, Consequences, and Addressing the Challenges," 2011, 4, https://doi.org/10.13140/2.1.3379.2003.
[78] Bagozzi, Koren, and Mukherjee, "Droughts, Land Appropriation, and Rebel Violence in the Developing World."
[79] James Hansen et al., "Climate Sensitivity, Sea Level and Atmospheric Carbon Dioxide," *Philosophical Transactions of the Royal Society A: Mathematical, Physical and Engineering Sciences* 371, no. 2001 (October 28, 2013): 20120294, https://doi.org/10.1098/rsta.2012.0294.
[80] Jasjit Singh, "Kashmir, Pakistan and the War by Terror," *Small Wars & Insurgencies* 13, no. 2 (August 2002): 81–94, https://doi.org/10.1080/09592310208559183.4/26/2022 3:00:00 PMBenjamin E. Bagozzi, Ore Koren, and Bumba Mukherjee, "Droughts, Land Appropriation, and Rebel Violence in the Developing World," *The Journal of Politics* 79, no. 3 (July 2017): 1057–72, https://doi.org/10.1086/691057.
[81] Bagozzi, Koren, and Mukherjee, "Droughts, Land Appropriation, and Rebel Violence in the Developing World."
[82] "Climate Security Mechanism."

to violent non-state actors to provide for themselves and their families.[83] These mechanisms, together, provide opportunities for violent non-state actors to plan and engage in further terrorist activities.[84]

Though climate change does not directly cause terrorism, it creates ample opportunities for violent non-state actors to further their agenda in different ways. To illustrate, Sunni Iraqis were grappling with severe environmental stress and anti-state grievances due to a long-lasting drought throughout the 2000s. In turn, the al-Nusrah Front and the Islamic State (IS) exploited these grievances as a tactic to recruit many Sunni Iraqis. The climate shock allowed them to increase their presence and grow in size.[85] Non-state violent groups are more likely to gain support when individuals and/or groups seek outlets for their state grievances. Regions that are more unstable offer non-state violent groups a plethora of vulnerabilities that may increase recruitment.[86]

Adopting "Opportunistic Behavior"

Lastly, tactical considerations of violent non-state actors are shaped by opportunities created by climate shocks and pressures. As climate-related changes influence environmental, economic, and structural breakdowns, violent non-state actors will adapt behaviors in response to new environments, aiming to produce more favorable circumstances for themselves.[87] Climate change allows violent non-state actors to strategically develop new tactical considerations.[88] For example, livestock raiding in Ethiopia, Kenya, and Uganda is more common in wet seasons when vegetation obscures stolen cattle and the extensive rainfall erases footprints.[89] Violent non-state actors can react to changing climatic conditions and for example, use the weather to disguise movement.[90]

Moreover, failed state responses to climate change, award VEOs the opportunity to gain influence over individuals and regions they otherwise would not have. For instance, in regions that lack strong governance, violent non-state actors seek to provide aid and assistance to vulnerable populations.[91] In these cases, violent non-state actors are exploiting groups and individuals' growing anti-state grievances by fulfilling traditional state roles. Thus, vulnerable populations become somewhat dependent and are indebted to violent non-state actors. While weak governance can create space for terrorist activity, violent non-state actors' tactics are conditional on the capacity and presence of the state, non-state, and opposing groups.[92] Tactical considerations of violent non-state actors are an essential factor in the climate-security-nexus and can be in a potential climate-terrorism pathway. As climate change progresses, the frequency and amplitude of climate shocks and pressures will increase, thus providing violent non-state actors with ample opportunity to commit and instigate violent conflict, and potential acts of terror. Resource scarcity, economic deprivation, and reduced state capacity will be significantly impacted by future climate events, causing an increase in concerns over the likelihood of terrorist activities.[93] Despite this pathway varying across contexts, there is evidence that violent non-state actors use climate-related conflict to their advantage, thus posing a real threat to security.

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[83] Axbard, "Income Opportunities and Sea Piracy in Indonesia."4/26/2022 3:00:00 PM"Climate Security Mechanism."

[84] Ramakrishna, "Delegitimizing Global Jihadi Ideology in Southeast Asia."

[85] Marcus DuBois King, "The Weaponization of Water in Syria and Iraq," *The Washington Quarterly* 38, no. 4 (October 2, 2015): 153–69, https://doi.org/10.1080/0163660X.2015.1125835.

[86] Renard, "Heated Terror: Exploration of the Possible Impacts of Climate Change on the Causes and the Targets of Terrorism."

[87] Renard, 16.

[88] van Baalen and Mobjörk, "Climate Change and Violent Conflict in East Africa"; Selby et al., "Climate Change and the Syrian Civil War Revisited."

[89] Raleigh and Kniveton, "Come Rain or Shine."

[90] van Baalen and Mobjörk, "Climate Change and Violent Conflict in East Africa."

[91] Mobjörk, "Pathways of Climate Insecurity: Guidance for Policymakers."

[92] Colin Walch, "Weakened by the Storm: Rebel Group Recruitment in the Wake of Natural Disasters in the Philippines," *Journal of Peace Research* 55, no. 3 (May 2018): 336–50, https://doi.org/10.1177/0022343317741535.

[93] Raleigh and Kniveton, "Come Rain or Shine"; Smith, "Climate Change, Weak States and the 'War on Terrorism' in South and Southeast Asia."

Bottom Line Summary

In sum, the present evidence does not support a direct causal link between climate change and terrorist activity. However, evidence suggests that the impacts of climate change create conditions that support violent contexts, including acts of terror. Climate change is increasingly understood to be a destabilizing force that enables VEOs to consider new strategies and tactics to achieve their objectives. Importantly, a future focus on the climate change-terrorism-nexus has a growing reach beyond less-developed nations and regions directly exposed to climate shocks and variability:

▶ **Accelerated urbanization is likely going to affect developed countries** as rapid population growth in less-developed countries seeks better opportunities in developed countries and communal conflict heightens. As a result, VEOs may exploit conflicts and instabilities in receiving countries.

▶ **Developed nations may need to offer aid and assistance to less-developed nations** as government infrastructure is overwhelmed by climate change, possibly leading to state failure.

▶ **Research on climate change's influence on terrorism is even more imperative given the impending danger of more frequent and intense climate shocks and pressures**, thus putting regions and groups' political, environmental, and human security at risk. Specifically, heightened climate risks will allow VEOs to strategically develop new tactical considerations.

Recommendations

While scholars continue to highlight the importance of the relationships between climate change and conflict, less is known about the relationships between climate change and terrorism. Therefore, the following three recommendations offer ways to advance research on the interactions between climate change and terrorism:

▶ Though it is evident that migration and mobility patterns play a critical role in violent conflict, **large-scale and long-term impacts are often explained away by factors not relating to climate change.** This pathway and relationship need greater attention in the future.

▶ Climate shocks and variability will have **disproportionate impacts on poor, underdeveloped, and developing countries where varying levels of fragility exist**. Climate-related disasters and stress will likely compound existing vulnerabilities further exacerbated by possible inadequate governmental responses. It would be beneficial to advance research on if, and how, these pathways apply to other regions of interest, like more developed economies.

▶ Researchers should seek to **leverage criminology to explore affected group pathways into illegal activity**. Criminologists have extensively studied the economic and crime relationship through conflict theories, subcultural theories, opportunity theories, and strain and social disorganization theory.

Suggested Data Sources

▶ Bagozzi, Benjamin E., Ore Koren, and Bumba Mukherjee. "Droughts, Land Appropriation, and Rebel Violence in the Developing World." *The Journal of Politics* 79, no. 3 (July 2017): 1057–72.

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▶ Renard, Par Thomas. "Heated Terror: Exploration of the Possible Impacts of Climate Change on the Causes and the Targets of Terrorism," n.d., 40.

▶ Reuveny, Rafael. "Climate Change-Induced Migration and Violent Conflict." *Political Geography* 26, no. 6 (August 2007): 656–73.

▶ Smith, Paul J. "Climate Change, Weak States and the 'War on Terrorism' in South and Southeast Asia." *Contemporary Southeast Asia* 29, no. 2 (August 2007): 264–85.

ABOUT THIS RAPID REVIEW

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ABOUT START

The National Consortium for the Study of Terrorism and Responses to Terrorism (START) is a university-based research, education and training center comprised of an international network of scholars committed to the scientific study of terrorism, responses to terrorism and related phenomena. Led by the University of Maryland, START is a Department of Homeland Security Emeritus Center of Excellence that is supported by multiple federal agencies and departments. START uses state-of-the-art theories, methods and data from the social and behavioral sciences to improve understanding of the origins, dynamics and effects of terrorism; the effectiveness and impacts of counterterrorism and CVE; and other matters of global and national security. For more information, visit www.start.umd.edu or contact START at infostart@umd.edu.

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A Climate of Terror?

Climate Change as a Potential Ideological Driver of Terrorism

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START

NATIONAL CONSORTIUM FOR THE
STUDY OF TERRORISM AND RESPONSES TO TERRORISM

IFTRIP

Pool Re
SOLUTIONS
Building resilience against terrorism risk

SUMMARY

Research Foci

▶ Adoption of climate change rhetoric in support of the primary ideology of a group/movement.

▶ The embrace of lethal terrorist tactics by environmental extremists against industrialized nations and corporations in response to the increasing human suffering and death tolls due to climate events.

▶ Climate change crystallizing previously disparate and highly localized grievances around a unifying narrative, thus increasing mobilization and transnationality.

▶ As more and more governments (and IGOs) take action to counter climate change, the possibility for climate change denial to become an ideological driver of violence.

Key Insights and Findings

▶ During the 1990s and early 2000s the Earth Liberation Front (ELF) conducted a series of attacks that resulted in millions of dollars of property damage and serve as the foundation for understanding climate change as a potential ideological driver of terrorism.

▶ Presently, there is very little support for significant acts of violence (against persons or property) within the mainstream and leftist environmentalist movement.

▶ Significant support exists for continued non-violent civil resistance methods to convince governments and industry to change policies. Support for tactics generally includes blockades, occupations, and selective property damage. Furthermore, while there is substantial support for non-violent civil disobedience, support for property destruction remains low.

▶ "Petro-masculinity" coupled with climate denialism and a variety of conspiracy theories have led to specific instances of targeted violence, terroristic tactics, and violence against climate activists, indigenous groups, and elected officials.

▶ Neo-Luddites, the Anti-Technology Movement, and "eco-fascists" currently present the most significant concern due to their support for violence against humans and desire to destroy technology assets.

▶ The Covid-19 pandemic has caused an amount of disillusionment within the mainstream environmentalist movement, and this may shape future ideological and tactical considerations.

CONTENTS

Background

Answering the question of whether climate change will be an ideological driver of political violence and terrorism is, in some respects, simple to answer. The Earth Liberation Front (ELF) has already demonstrated that factions of the environmentalist movement can become violent and cause large-scale destruction. In October 1998, ELF members caused 12 million dollars in damage to the Two Elk Lodge and various other buildings and chairlifts at the Vail Ski Resort in Vail, Colorado. If a similar attack were to happen today, the costs would total over $20.5 million in damage with inflation. Throughout the late 1990s, ELF property destruction regularly amassed over $1 million in damages. In the early 2000s, their levels of property destruction continued. An attack on a University of Washington research center cost over $7 million in property damage. They set fire to 30 SUVs at a car dealership totaling another million dollars in damages and burned down a mansion in Colorado that caused $2.5 million in damage. In 2006 and 2008 they destroyed more luxury housing comprising an additional $10 million in damages across multiple home sites.

> *"In October 1998, ELF members caused 12 million dollars in damage to the Two Elks Lodge…. If a similar attack were to happen today, the costs would total over $20.5 million with inflation".*

A significant Federal Bureau of Investigations (FBI) response brought about the arrests of multiple key members of the movement and these property damage events have significantly declined. Ted Kaczynski, popularly known as the Unabomber, presents another set of extreme environmental beliefs – in his case primitivism, hatred of modern technology, and industrialization – serving as a motive for terroristic violence. Unlike ELF, who intentionally avoided killing people, Kaczynski methodically targeted individuals for assassination. In total, he killed three and injured 23 others in a series of bombings that lasted from 1978 through 1995.

Despite these above facts, terrorist incidents where climate change or environmentalism serve as the primary ideological force remain rare. The Armed Conflict Location & Event Data (ACLED) Project identified over 10,000 climate-related events between March 2019 and March 2022. Of those, 231 involved some level of violence. Eight climate-related events are classified as armed clashes (5) or explosions (3).

There are individuals and groups who espouse violent climate-related rhetoric, but we do not currently judge them to pose a major threat to individuals or infrastructure. However, continued inaction will likely increase climate-related radicalization (see rapid review #3). Perceived and real existential threats are a vital component of violent radicalization. As more individuals suffer the consequences of climate change, we should expect increased radicalization and potential violence.

> *Perceived and real existential threats are a vital component of violent radicalization. As more individuals suffer the consequences of climate change, we should expect increased radicalization and violence.*

Presently, there are still opportunities to mitigate threats to infrastructure and/or harden infrastructure to minimize peril. This could be achieved by blending mainstream environmentalist policy solutions (e.g. increased use of renewable materials/resources and divestment from polluting industries) coupled with practical capital investments. Some effects of climate change will be unavoidable, and we should expect climate-related terrorism, but we assess that there remains an opportunity to mitigate the overall reach and saliency of violent rhetoric and direct action.

Evidence Review

Relevant Extreme Ideologies

The urge to commit violence to achieve political or societal goals exists on the fringes of all ideologies. Many individuals openly espouse or quietly retain radical beliefs. In open, democratic societies it is generally not a crime to express radical beliefs. However, a sliver of radicals will go on to act violently to bring about their vision/goals.

There are three broadly defined groups of concern: violent far-left environmentalists, far-right climate denialists, and the anti-technology movement. Facets within each of these subdivisions have argued explicitly for violent actions in one form or another.

Leftist Ideologies

Climate change is an inherently political issue and has been a consistently controversial topic, particularly in industrialized and post-industrial nations. Center-left and left political parties have been, and continue to be, the main champions of proactive climate change policy. This is also true for the environmental activist community. Two surveys of environmentalists conducted in Sweden and France showed that participants overwhelmingly identify as center-left or left.[1] These same surveys show that within the mainstream activist community there is very little support for violent behavior (property destruction) and support for violence against humans is virtually non-existent. Three-quarters of Swedish respondents do believe that radical changes to society are necessary to prevent irrevocable harm.[2] But the intellectual leaders of the climate movement are not arguing for direct action or a repeat of the mass destruction committed by ELF. Instead, they are focusing on using nonviolent civil resistance to pressure governments to use their authority to coerce private firms.[3] Further, now that the environmentalist movement has transitioned to a climate justice paradigm, violent direct action, including sabotage (ecotage), is antithetical to their overall goals.[4]

> *"… within the mainstream activist community there is very little support for violent behavior (property destruction) and support for violence against humans is virtually non-existent"*.

The effects of the pandemic on the mainstream (and fringe) environmentalist movement remain to be seen. Prior to the pandemic, Extinction Rebellion and Greta Thunberg's Fridays for Future were finding real popular support in the streets, but the pandemic may have depleted activists of their energy.[5] And yet, ACLED data shows that over 3,000 climate and environmental movement protests occurred in 2020 during the height of the pandemic. The same data shows that over 5,000 protests occurred in 2021 across the globe. This suggests that the movement remains strong. ACLED data also shows an increase in the number of climate/environment-related riots from 38 in 2020 to 58 in 2021. Because of the pandemic, it is impossible to know if these increases in protests and riots were the result of increased frustration or if 2020 levels were artificially decreased. Regardless, the pandemic has diverted attention from climate change. As grievances against the government and polluting industries continue to grow, some on the fringes will likely feel an existential threat and feel compelled to direct action.

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[1] Pederby, T. (2021). Fifty Shades of Green: Ideological divides in the environmental movement; Gaborit, M. (2020). Disobeying in Time of Disaster: Radicalism in the French Climate Mobilizations. *Youth and Globalization*, *2*(2), 232-250.

[2] Pederby (2021)

[3] Hallam, Roger. 2019. Common Sense for the 21st Century: Only Nonviolent Rebellion Can Now Stop Climate Breakdown and Social Collapse. London: Chelsea Green.

[4] Hornborg, A. (2021). A pandemic can do what a movement cannot. *Social Anthropology*, *29*(1), 210.

[5] Hornborg (2021); Bond, P. "Defense of climate justice in the Glasgow Agreement," *Memo: Politica, Economía y Poder*, 31 October 2021.

Right Ideologies

Mainstream conservative political parties in many countries have downplayed the importance of climate change.[6] This sentiment has been expressed in numerous ways. Mainstream conservative think tanks and politicians have consistently called environmental science "junk science"[7] and argue for "human exemptionalism," that is, that a combination of the free market, scientific advancement, and technology will resolve whatever climate-related issues we face.[8]

This climate skeptic and denial rhetoric have fostered pro-fossil fuel, anti-environmentalist sentiment in some nations. These movements have been called "pipeline popularism"[9] and "petro-masculinity."[10] In short, by tying polluting extractive industries and existing "car culture" to masculinity, climate change legislation and calls for renewable energy and resources become a threat to masculinity. In Canada, these fears have merged with certain conspiracy theories and been linked to incidents of violence against First Nations (water and land protectors) and death threats against elected officials.[11]

Overall, there is scant evidence to tie mainstream conservative discourse to acts of violence or terrorism, but as divestment from fossil fuels continues there is a possibility of retributive violence against governments and firms. While not in scope for this rapid review, it is possible that the very real threat of losing employment will present a real or perceived existential threat to some individuals. Conversely, building off the nascent stochastic terrorism it is possible for "sociopolitical commentary," in the form of continued climate denial, to foster increased levels of violence.[12]

Far-right movements, namely ecofascism do present a clear and significant concern given the recent increased interest within far-right social media communities and the existing evidence of violent intent. The terrorists who committed the Christchurch terrorist attacks and the El Paso attack, both in 2019, made direct and indirect references to ecofascist ideologies in their manifestos.[13] The Christchurch attacker claimed the ecofascist title in his manifesto and the El Paso attacker discussed issues related to population pressures and "great replacement" ideologies. Campion defines ecofascism as "a reactionary and revolutionary ideology that champions the regeneration of an imagined community through a return to a romanticised, ethnopluralist vision of the natural order."[14] Ecofascists generally link a version of ethnonationalism with ecological goals. This will include claims that immigration harms "native soil" and "native blood."[15] But unlike the fascist race-based ideologies that developed out of Nazism, ecofascism argues a radical right ecology whereby cultures, ethnicities, and races must maintain barriers to protect "natural diversity" and that the "correct" path forward is not multicultural.[16] By this reasoning, immigrants can be seen as the root cause of ecological disasters.[17]

[6] McCright, A. M., & Dunlap, R. E. (2011). Cool dudes: The denial of climate change among conservative white males in the United States. *Global environmental change*, *21*(4), 1163-1172; Krange, O., Kaltenborn, B. P., & Hultman, M. (2019). Cool dudes in Norway: climate change denial among conservative Norwegian men. *Environmental Sociology*, *5*(1), 1-11; Dunlap, R. E., & Jacques, P. J. (2013). Climate change denial books and conservative think tanks: Exploring the connection. *American Behavioral Scientist*, *57*(6), 699-731; Jylhä, K. M., Cantal, C., Akrami, N., & Milfont, T. L. (2016). Denial of anthropogenic climate change: Social dominance orientation helps explain the conservative male effect in Brazil and Sweden. *Personality and Individual differences*, *98*, 184-187.

[7] Jacques, P. J., Dunlap, R. E., & Freeman, M. (2008). The organisation of denial: Conservative think tanks and environmental scepticism. *Environmental politics*, *17*(3), 349-385; Herrick, C. N. (2001). Junk science and environmental policy: obscuring public debate with misleading discourse. *Philosophy and Public Policy Quarterly*, *21*(2/3), 11-16.

[8] Cairns Jr, J. (1999). Exemptionalism vs environmentalism: the crucial debate on the value of ecosystem health. *Aquatic Ecosystem Health & Management*, *2*(3), 331-338.

[9] Trew, S. "Pipeline populism," *Monitor*, July/August 2019.

[10] Daggett, C. (2018). Petro-masculinity: Fossil fuels and authoritarian desire. *Millennium*, *47*(1), 25-44.

[11] Greaves, W. (2021). Climate change and security in Canada. *International Journal*, *76*(2), 183-203.

[12] Amman, M., & Meloy, J. R. (2021). Stochastic Terrorism. *Perspectives on Terrorism*, *15*(5), 2-13.

[13] Campion, K. (2021): Defining Ecofascism: Historical Foundations and Contemporary Interpretations in the Extreme Right, Terrorism and Political Violence, DOI: 10.1080/09546553.2021.1987895

[14] Campion (2021), 2.

[15] Zimmerman, M.E. (1995). "The Threat of Eco-Fascism," *Social Theory and Practice* 21, no. 2, 211.

[16] Campion (2020).

[17] Lawton, G. (2019). "The Rise of Real Eco-Fascism," *New Scientist* 243, no. 3243.

Ecofascism fosters significant interest from the far-right and alt-right because they can launder their ideologies through the lens of ecology and environmentalism. The added pseudo-scientific rationalization of racist, ethnocentric beliefs has aided the far-right and alt-right in mainstreaming their beliefs. Ecofascist ideas are extensive and expand into the below-mentioned Anti-Technology Movement.[18]

The Anti-Technology Movement

There also exists a difficult-to-classify using traditional political typologies (liberal, moderate, conservative, etc.) set of actors who are, at present, the most concerning. Aspects of the Anti-Technology Movement (ATM) are explicitly violent, neo-Luddites. Ted Kaczynski is an exemplar of this movement. Aspects of ATM ideas and interests overlap with mainstream left-wing environmentalists and far-right ecofascists. ATM desires the wholesale destruction of technologies.[19] The Radical Environmentalist Milieu is the subset of the ATM that explicitly merge environmentalism and violence. Historic groups including Animal Liberation Front, the Revolutionary Cells-Animal Liberation Brigades, EarthFirst!, and the Earth Liberation Front are typically classified within this grouping.[20] These former groups advocated for direct action and violence, but explicitly avoided violence against humans. This was obviously not the case for Kaczynski and the currently active Individualistas Tendiendo a lo Salvaje (Individualist Tending Towards the Wild; ITS) who, since the early 2010s, have committed numerous indiscriminate acts of violence in Mexico. ITS describes itself as being "an anti-industrial, anti-technological, and anti-civilization group formed by radical environmentalists."[21]

ITS activities are largely overshadowed by the extreme violence of Mexican narcotrafficking cartels and, as such, have managed to operate without significant resistance or government response. ITS is unique amongst currently operating groups because of its explicit nihilist viewpoint and desire to commit unequivocally violent, terroristic acts. Within the last decade, ITS has bombed universities, including the Monterrey Institute of Technology and Higher Education (Tec de Monterrey), and murdered a researcher at the Biotechnology Institute at the National Autonomous University of Mexico.[22]

The emerging linkages between technophobia and environmentalism are concerning. A recent academic article suggests that by 2040, this will represent the next "wave" of terrorism.[23] This builds off the "waves of terrorism" thesis that suggests forms of terrorism come in waves. Rapoport, who developed the theory traces an initial anarchist wave in the 1880s followed by anti-colonial terrorism, then New Left terrorism, and finally a wave of religious terrorism.[24] Other research suggests that Animal Rights Extremists who were active as of 2017 and Deep Green Resistance are a potential bioterrorism threat.[25]

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[18] Loadenthal, M. (2022). Feral fascists and deep green guerrillas: infrastructural attack and accelerationist terror. *Critical Studies on Terrorism*, 1-40.

[19] Lubrano, M. (2021). Stop the Machines: How Emerging Technologies are Fomenting the War on Civilization. *Terrorism and Political Violence*, 1-17.

[20] Lubrano (2021); Hirsch-Hoefler, S., & Mudde, C. (2014). "Ecoterrorism": Terrorist threat or political ploy?. *Studies in Conflict & Terrorism*, *37*(7), 586-603.

[21] Lubrano (2021); Loadenthal, M. (2022). Feral fascists and deep green guerrillas: infrastructural attack and accelerationist terror. *Critical Studies on Terrorism*, 1-40.

[22] Lubrano (2021); Spadaro, P. A. (2020). Climate change, environmental terrorism, eco-terrorism and emerging threats. *Journal of Strategic Security*, *13*(4), 58-80.

[23] Torres-Soriano, M. R., & Toboso-Buezo, M. (2019). Five terrorist dystopias. *The International Journal of Intelligence, Security, and Public Affairs*, *21*(1), 49-65.

[24] Rapoport, D. C., Cronin, A. K., & Ludes, J. (2004). The four waves of modern terrorism. *Attacking Terrorism: Elements of a Grand Strategy (Washington, DC: Georgetown University Press 2004) p*, *54*, 3-11.

[25] Spadaro (2020); Kallenborn, Z., & Bleek, P. C. (2020). Avatars of the Earth: Radical Environmentalism and Chemical, Biological, Radiological, and Nuclear (CBRN) Weapons. *Studies in Conflict & Terrorism*, *43*(5), 351-381.

Bottom Line Summary

We are ahead of the curve, but only just. In 2021, five countries experienced temperatures above 50° Celsius.[26] Recently, the United Nations Climate Change Executive Secretary, Patricia Espinosa, stated that by 2100, half of the population in the Middle East and North Africa will face "super extreme" weather events with temperatures up to 60°C.[27] The emerging heatwaves alone will cause significant loss of life before out-migration and temperature rise makes these regions completely unlivable. Consider a future where Muslims are unable to visit Mecca, Jews are unable to visit the Western Wall, and Christians are unable to visit the Church of the Holy Sepulchre. Economically, how does global trade continue without access to the Suez Canal and the Middle East's oil and natural gas deposits?[28]

On April 22, 2022, Wynn Bruce, an apparent Buddhist practitioner and climate activist self-immolated in from of the U.S. Supreme Court ostensibly because of his distress over climate inaction.[29] Previously, in 2018, a lawyer and climate activist, David Buckel, self-immolated in a public park in Brooklyn, New York. According to news reporting, both Bruce and Buckel were influenced by the similar actions of Vietnamese monks during the Vietnam War.[30] Bruce's friend, a Zen Buddhist priest based in Denver called his suicide "a deeply fearless act of compassion to bring attention to climate crisis."[31] The priest was subsequently quoted in *The New York Times* that "people are being driven to extreme amounts of climate grief and despair." Acts of self-immolation are shocking acts that, as acts of protest, sit between non-violent civil resistance and violence.[32] In this context, they are inherently political acts – the images of Thích Quảng Đức's self-immolation are indelibly linked to Vietnam and Mohamed Bouazizi's self-immolation is credited with sparking Tunisia's Jasmine Revolution.[33]

The oncoming environmental and humanitarian disasters will likely radicalize individuals to violence. There is empirical evidence that famines and other externalities of climate change likely increase conflict and "social disturbances."[34] We cannot know what the extent of climate-related terrorism will be, that will require further study with different methods. But we do know that the drivers of radicalization and extremism are present on the extremes of the left and the right. Presently, this appears most commonly on the left in the form of despair and self-destruction while on the right it appears as nihilism, broadly defined. Climate and/or environmental motivated terrorism is an area of near-future concern.

Recommendations

There is a clear opportunity to decrease the likelihood of climate change becoming a leading ideological driver behind terrorism. What follows are a series of near- and long-term recommendations.

▶ **Futures Workshop:** Use causal layered analysis to plan for multiple potential futures, develop narratives, strategies, and policy options

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[26] ≥122°F; Cappucci, M. "Record heat bakes Middle East as temperatures top 125 degrees," *Washington Post*, 7 June 2021.

[27] ≥140°F; Kennedy, R. "'Grave threat to life': UN climate chief issues warning for MENA," *Al Jazeera*, 26 March 2022.

[28] It is possible to counter with the opening of Arctic waterways as Arctic ice melts and oil and natural gas deposits in the Arctic.

[29] Bradbury, S. "Boulder climate activist dies after apparent act of protest outside U.S. Supreme Court on Earth Day," *The Denver Post, 24 April 2022;*

[30] Ibid.

[31] Ibid.

[32] Ibid.

[33] Uzzell, J. (2012). Biopolitics of the Self-immolation of Mohamed Bouazizi. *e-international relations*, *7*; Kallio, K. P., & Häkli, J. (2017). Geosocial lives in topological polis: Mohamed Bouazizi as a political agent. *Geopolitics*, *22*(1), 91-109; Hope, M. (1967). The reluctant way: self-immolation in Vietnam. *The Antioch Review*, *27*(2), 149-163; Lauesen, C. M. (2019). *Contemplation in Fire: Immolation, Photography, and Vietnam 1963*. Stanford University.

[34] Damette, O., & Goutte, S. (2020). Beyond climate and conflict relationships: new evidence from copulas analysis.

- **Threatcasting Targets:** This method brings together a transdisciplinary group of scholars and practitioners to develop plausible future scenarios with a specific focus on climate terrorist target selection.
- Promulgate further research into malign narratives and emerging threats.

Suggested Data Sources

- LaFree, G., & Dugan, L. (2007). Introducing the global terrorism database. *Terrorism and political violence*, *19*(2), 181-204.
- Raleigh, C., Linke, A., Hegre, H., & Karlsen, J. (2010). Introducing ACLED: an armed conflict location and event dataset: special data feature. *Journal of peace research*, *47*(5), 651-660.
- Leah Temper, Daniela del Bene and Joan Martinez-Alier. 2015. Mapping the frontiers and front lines of global environmental justice: the EJAtlas.

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The National Consortium for the Study of Terrorism and Responses to Terrorism (START) is a university-based research, education and training center comprised of an international network of scholars committed to the scientific study of terrorism, responses to terrorism and related phenomena. Led by the University of Maryland, START is a Department of Homeland Security Emeritus Center of Excellence that is supported by multiple federal agencies and departments. START uses state-of-the-art theories, methods and data from the social and behavioral sciences to improve understanding of the origins, dynamics and effects of terrorism; the effectiveness and impacts of counterterrorism and CVE; and other matters of global and national security. For more information, visit www.start.umd.edu or contact START at infostart@umd.edu.

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A Climate of Terror?

Climate Change as a Means for Terrorist Exploitation

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NATIONAL CONSORTIUM FOR THE
STUDY OF TERRORISM AND RESPONSES TO TERRORISM

IFTRIP

Pool Re
SOLUTIONS
Building resilience against terrorism risk

SUMMARY

Research Questions

- ▶ In what ways can violent extremist organizations (VEOs) exploit the effects of climate change as a means to control or coerce populations in their operational areas?

- ▶ To what extent have VEOs advanced recruiting efforts in response to negative climate change impacts in an attempt to exploit climate change vulnerabilities?

Key Insights and Findings

- ▶ VEOs may exploit individual and group grievances and insecurities exacerbated by climate change for recruitment into violent radicalization, including fostering radicalization narratives of marginalization, exclusion, and relative deprivation.

- ▶ VEOs may exploit weakened (real and perceived) government capacity and legitimacy to respond to climate change by fostering radicalization narratives of alienation and abandonment. Furthermore, VEOs may attempt to fill in this gap by responding to the challenges posed by climate change to enhance their local authority and continue to undermine their opponents (generally the government).

- ▶ VEOs may exploit the effects of climate change as a means to exert influence over populations by exercising strategic tactics (capture, sabotage, and/or looting) to cause physical and economic harm to infrastructure and services or choose to strategically control such resources. Specifically, VEOs can exploit the impacts of climate shocks to inflict maximal damage undermining political and socioeconomic structures to further their ideological objectives.

- ▶ VEOs may exploit the impacts of climate change to influence populations by aggravating political and socioeconomic weaknesses to exert control over essential provisions and resources' nodes and networks. Additionally, the profitability of controlling essential provisions and resources may lead to more VEOs strategically capturing resources and their markets fully, or partially, and weaponizing them to support operational functions.

CONTENTS

Background

Broadly, climate change is increasingly contributing to environmental, political, and socioeconomic fragility and insecurity. Violent extremist organizations (VEOs) proliferate and can operate more easily in fragile contexts. As the frequency and severity of climate change increase, a better understanding of the ways VEOs exploit the effects of climate change as a means to control or coerce populations in their operational areas becomes more pressing. In particular, increased fragility and insecurity facilitate opportunities for VEOs to,

> ► Attract sympathizers and recruit new members; and
> ► Actively weaponize resulting insecurities to pursue strategic and tactical ends.

While most existing research on the interactions between climate change and terrorism explores terrorist organizations in relation to macro trends and meso factors,[1] this rapid review first highlights the *conditions*, *drivers*, and *enabling factors* underlying possible recruitment and radicalization into violent extremism pathways and their links to climate change. In other words, this rapid review broadly aims to address how climate change affects patterns of violent radicalization. The rapid review then pivots to examine VEOs motives and decision-making about climate change. Of particular concern are the ways VEOs may weaponize environmental factors and insecurities to coerce populations in pursuing their strategic and tactical ends.

> *"Violent extremist organizations (VEOs) proliferate and can operate more easily in fragile contexts."*

Evidence Review

Radicalization into Violent Extremism

There is growing expert consensus that there is no single "terrorism," nor is there a single terrorist profile.[2] Unlike terrorism, the understanding that radicalization is a process whereby people turn to extremism is not particularly controversial. Radicalization into violent extremism can be understood as a set of complex pathways with unique formations and dynamic causal mechanisms that can lead to multiple outcomes, including acts of terror.[3] There are several approaches and models used to explain and visualize radicalization into violent extremism.[4] Regardless of competing models, there is consensus that radicalization must be conceived as a set of multifaceted pathways that play out over a period of time and involves different factors and dynamics.[5]

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[1] King, Marcus DuBois, 2015. "The weaponization of water in Syria and Iraq." *The Washington Quarterly* 38(4): 153-169; Nett, Katharina and Rüttinger, Lukas. 2016. *"Insurgency, terrorism and organised crime in a warming climate: Analysing the links between climate change and non-state armed groups". Adelphi Climate Diplomacy Report.*; Walch, Colin, 2018. "Weakened by the storm: Rebel group recruitment in the wake of natural disasters in the Philippines." *Journal of Peace Research,* 55(3): 336-350.

[2] Borum, Randy, 2011. "Radicalization into violent extremism I: A review of social science theories." *Journal of strategic security* 4(4): 7-36; Horgan, John, 2008. "From profiles to pathways and roots to routes: Perspectives from psychology on radicalization into terrorism." *The ANNALS of the American Academy of Political and Social Science* 618(1): 80-94.

[3] Ibid,

[4] Borum, Randy. 2011a. "Radicalization into violent extremism I: A review of social science theories." *Journal of strategic security* 4(4): 7-36; Borum, Randy. 2011b. "Radicalization into violent extremism II: A review of conceptual models and empirical research." *Journal of strategic security* 4(4); 37-62. McCauley, Clark, and Sophia Moskalenko. 2017. "Understanding political radicalization: The two-pyramids model." *American Psychologist,* 72(3): 205.

[5] Jensen, Michael A., Anita Atwell Seate, and Patrick A. James. 2020. "Radicalization to violence: A pathway approach to studying extremism." *Terrorism and Political Violence* 32(5): 1067-1090; Fahey, Susan, and Simi, Pete, 2019. "Pathways to violent extremism: a qualitative comparative analysis of the US far-right." *Dynamics of Asymmetric Conflict* 12(1): 42-66; Hwang, Julie Chernov, 2018. "Pathways into terrorism: understanding entry into and support for terrorism in Asia." *Terrorism and political violence* 30(6): 883-889.

To simplify the complexity of radicalization models we can determine five common elements:[6]

1) The existence of **predisposing life experiences** that typically reflect historical and structural conditions that preceded the shift towards violent extremism.
2) Proximal or acute **activating situations** that serve as drivers and enabling factors to engage in violent extremism.
3) The existence of **predisposing vulnerabilities** that typically reflect an individual's "need" states (psychological and psychosocial) that can push an individual to seek alternative world views.
4) Intensity of **social and group dynamics** that can facilitate an individual's engagement with an extremist group.
5) Application of **ideology and narrative** which fosters in-group formation and out-group derogation and offers action pathways to violence and terror.

These elements offer clarity in understanding radicalization as they shed light on the potential conditions, drivers, and enabling factors of violent extremism. Additionally, radicalization into violent extremism occurs at one or several levels:[7]

▶ **Micro Level:** Corresponds to the individual person and involves feelings of alienation, marginalization, discrimination, relative deprivation, humiliation, and rejection among others;
▶ **Meso Level:** Includes communities and groups and relates to the supportive social surroundings or broader extremist environment;
▶ **Macro Level:** Includes the roles of government (including its foreign policy), society (e.g., public opinion), socioeconomic opportunities, and majority-minority dynamics, among other elements.

While these levels are closely interrelated they capture different levels of explanations of radicalization into violent extremism. Moreover, these different levels clarify that there is no single driver of radicalization, but rather, several complex push, pull, and personal factors that affect radicalization into violent extremism.[8]

In this regard, we can begin to consider how climate change impacts the process of radicalization into violent extremism in several ways (see Figure 1). For instance, climate change creates environmental insecurity that sets the conditions for which grievances emerge, especially related to material and livelihood deterioration. Climate change also aggravates other human insecurities creating new needs, like better access to food and water, to alleviate vulnerability and risk. Furthermore, climate change exacerbates existing political insecurities stressing the state's capacity to address population needs. VEOs fuel grievances by offering compelling narratives of who is to blame, like the government, and radicalizing agents offer opportunities to improve population or individual needs.

Push Factors: *Overlap with structural root causes of terrorism that drive people toward resorting to violence.*

Pull Factors: *Capture aspects that make extremist groups/lifestyles appealing to some.*

Personal Factors: *Specific individual characteristics that make individuals more vulnerable to extremist ideology.*

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[6] Ibid.

[7] Bjørgo, Tore, (ed.) 2005. *Root causes of terrorism: Myths, reality and ways forward.* London: Routledge; Newman, Edward. 2006. "Exploring the "root causes" of terrorism." *Studies in Conflict & Terrorism* 29(8): 749-772. Bjørgo, Tore, and Andrew Silke. 2018. "Root causes of terrorism." In Silke (ed). *Routledge Handbook of Terrorism and Counterterrorism*: 57-65.

[8] Vergani, Matteo, Muhammad Iqbal, Ekin Ilbahar, and Greg Barton. 2020. "The three Ps of radicalization: Push, pull and personal. A systematic scoping review of the scientific evidence about radicalization into violent extremism." *Studies in Conflict & Terrorism* 43(10): 854-854.

Overall, climate change impacts radicalization into violent extremism in the following ways:

▶ **Exacerbate the underlying conditions** necessary for terrorism to develop (i.e., the "root causes" of terrorism);

▶ **Multiply the drivers of radicalization** that can facilitate the emergence of terrorism (i.e., push, pull, and personal factors);

▶ **Multiply and intensify the number of enabling factors** that can lead to surges in political violence, including acts of terrorism (i.e., political instability);

Figure 1: *Radicalization into Violent Extremism Model*
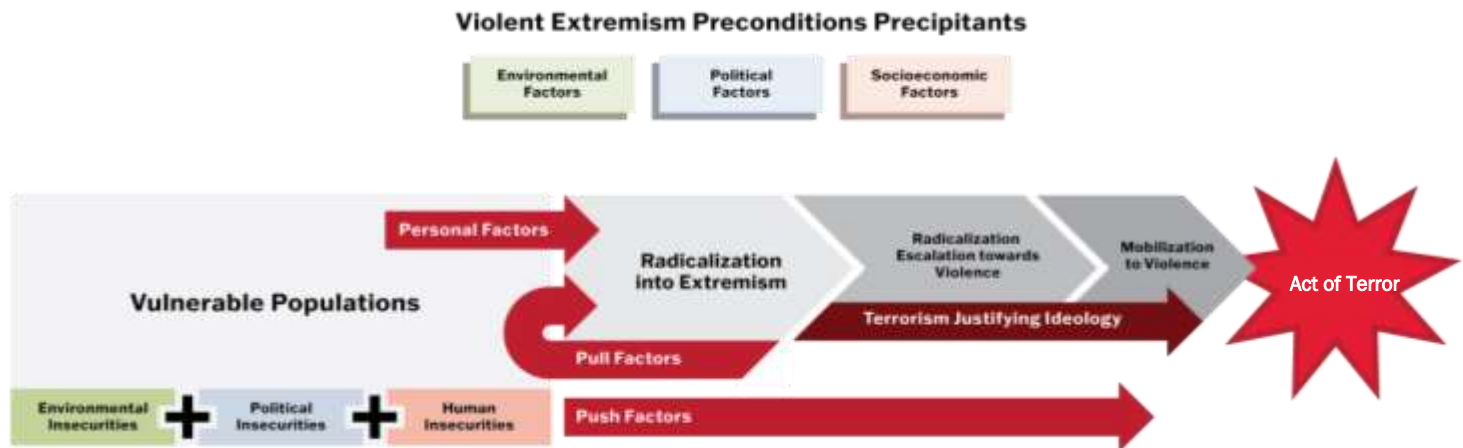
Climate Change and Root Causes of Terrorism

A useful approach to better understanding how climate change serves as a means for terrorist exploitation to control or coerce populations is to explore the ways climate change may exacerbate the "root causes" of terrorism.[9] The concept of root causes of terrorism suggests that there are casual relationships that can be determined between underlying societal conditions and terrorist activity. Therefore, one can identify "causes" of terrorism and take action to eliminate or reduce them. However, the root causes approach is far more nuanced than it initially appears, offering more than a simplistic cause-effect understanding of terrorism.[10]

Root causes consist of multiple combinations of factors and circumstances ranging from general to specific, societal to the individual level, global to local, dynamic to static, or other possible variations.[11] While there is some controversy around the idea of root causes,[12] as an analytical approach, root causes create a framework where several conceptual distinctions offer explanations that inform our understanding of the conditions, drivers, and enabling factors of terrorism. A useful distinction is to engage two different types of causes behind terrorism:[13]

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[9] Bourekba, Moussa. 2021. "Climate change and Violent Extremism in North Africa. Barcelona Centre for International Affairs (CIDOB)"; Asaka 2021; Institute for Economics and Peace, 2020. "Ecological Threat Register 2020". *Understanding Ecological Threats, Resilience, and Peace.*

[10] Silke and Bjørgo 2018; Horgan, John. 2014. *The Psychology of Terrorism* (2nd ed.). London: Routledge.

[11] Sinai, Joshua. 2005. "A conceptual framework for resolving terrorism's root causes". In Bjørgo (ed.) *Root Causes of Terrorism: Myths, Reality and Ways Forward*. London: Routledge.

[12] Bennett, William. 2002. *Why We Fight: Moral Clarity and the War on Terrorism.* Washington, DC: Regnery Publishing Inc. Crenshaw, Martha. 1981. "The causes of terrorism." *Comparative politics* 13(4): 379-399.

[13] Chrenshaw 1981, Bjørgo 2005. Neumann, Peter. 2017. "Countering Violent Extremism and Radicalisation That Lead to Terrorism: Ideas, Recommendations, and Good Practices from the OSCE Region", *Organisation for Security and Co-Operation in Europe.*

▶ **Preconditions:** phenomena that tend to be structural in nature and enable a wide range of outcomes, of which terrorism is only one. It should be noted, that even if preconditions exist for a given context they are not solely responsible for causing terrorism. In other words, preconditions are those conditions that set the stage for the emergence of terrorism. Common examples of preconditions include political instability, weak rule of law, corruption, inequality, etc.

▶ **Precipitants:** types of causes that more directly influence the emergence of terrorism. Precipitants are commonly understood as push, pull, and personal factors that directly affect a vulnerable individual or group's propensity towards radicalization into violent extremism.

In all, root causes represent the structures that set the stage for terrorism in the long term (preconditions) and the specific events or phenomena that can facilitate, motivate or trigger radicalization into violent extremism and/or terrorist acts (precipitants).[14] Climate change as a threat multiplier can aggravate existing preconditions and multiply precipitants which may drive recruitment and radicalization in diverse contexts (Figure 2). Taking this point into account, investigating the ways climate change can exacerbate diverse climate, contextual, and escalating factors believed to lead to violent radicalization is necessary. Increased vulnerability and insecurity combined with climate change fragility provide advantageous opportunities to attract more members as a result of increasingly adverse conditions.[15]

> *"Climate change as a threat multiplier can aggravate existing preconditions and multiply the precipitants which may drive recruitment and radicalization"*

To start, the root causes approach differentiates between different levels and types of causation related to the process of radicalization:[16]

▶ **Structural causes** impact peoples' lives in ways that they may or may not be conscious of or understand at the macro level. Macro-level trends generally relate to systemic conditions such as globalization or rapid modernization that shape life chances in different contexts.

▶ **Facilitator (or accelerator) causes** capture aspects of violent extremism and terrorism that are appealing and attractive, without being principal forces. Facilitator causes are significantly impacted by pull factors like violent extremist narratives (i.e. propaganda), a sense of belonging, ideology, and other incentives (e.g., monetized opportunities).

▶ **Motivational causes** are the actual grievances individuals experience at the micro (personal) level that motivate them to act. Grievances are more than momentary feelings or expressions of discontent, rather they are the source or symptoms of an individual's real or perceived suffering. Motivational causes are underpinned by the adoption of a particular ideology and extremist rhetoric that places an individual on the radicalization spectrum where hostility and violence are further rationalized.

▶ **Triggering causes** are the direct precipitators of terrorist acts. Triggering causes are diverse and may be historic or provocative events, a disaster, an offensive act committed by perceived enemies, or other events and actions that call for revenge or mobilization.

An illustration of how these factors and different causal levels can link together climate fragility risk and violent extremism can be seen in Table 1. The table is useful in highlighting the complex range of factors that are involved as well as showing that the boundaries between factors and levels and types of causation are often blurred.

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[14] Bjørgo 2005.
[15] Stuart, Jack. 2019. "Climate Change and Violent Extremism in Africa: A Contested Link". In Tschudin Alain, Moffat, Craig, Buchanan-Clarke, Stephen, Russel, Susan, and Lloyd Coutts (eds.), *Extremisms in Africa* (vol. 2). Tracy McDonald Publisher. London.
[16] Ibid, 3-4.

*Table 1: Root causes of terrorism in climate fragile contexts*

Structural Causes	Facilitator Causes
Climate variability	Resource competition
Climate pressure	Lack of opportunities (e.g., unemployment)
Lack of good governance (state fragility)	Climate-related migration
Globalization	Elites' exploitation of resources
High/Rising levels of distributive inequality	Alienation and abandonment
Poor climate adaptability	
Resource scarcity/abundance	
Motivational Causes	**Triggering Causes**
Livelihood loss	Climate Shock
Absolute and relative deprivation	Economic shock
Lack of resilience	Environmental destruction
Ethno-cultural tensions	Rising cost of living (e.g., food)
Environmental degradation	Climate adaption policies and practices
Climate-related displacement	Resource conflict
Exclusion and marginalization	

Importantly, just because a root cause may be present in a given context does not necessarily mean that radicalization to violence or terrorism will occur. As we have seen, causes operate at different levels from large-scale macro trends to everyday individual personal factors.

Overall, underlying grievances in the context of enabling conditions (structural causes) may give rise to increased radicalization into violent extremism and terrorist activity as a result of precipitant and motivational forces. Underlying grievances and motivational forces serve VEOs' recruitment efforts in not only sourcing terrorist recruits but also assisting in building a supportive base. Thus, climate change increasingly shapes contributing factors to vulnerability and fragility negatively impacting aggrieved individuals. In return, vulnerable individuals seek alternative views which address their grievances and in some cases, VEOs offer those alternative views (or opportunities).

The root causes approach does not imply a direct causal relationship between climate change and violent extremism but rather highlights the fact that climate change is a threat multiplier exacerbating the underlying conditions of terrorism and multiplying the drivers of radicalization into violent extremism.

Figure 2: Preconditions and precipitants of risk of violent radicalization and terrorism
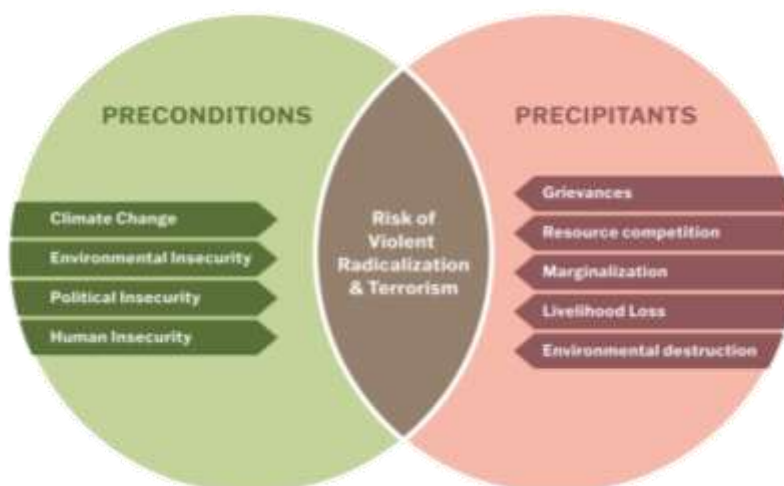
Climate Change in Terrorist Recruitment and Radicalization Narratives

VEOs employ a range of communication strategies to advance their strategic objectives.[17] Narratives are the most pervasive communication strategy of VEOs in recruitment and radicalization. Narratives serve to convey ideology, values, justifications, or key messages to potential recruits and the greater public.[18] Put simply, narratives' main function is to *persuade*. In the context of terrorism, narratives are employed to shift beliefs and attitudes. The extent to which narratives change beliefs or attitudes is mainly reliant on the underlying conditions (root causes) and drivers (push, pull, and personal factors) that facilitate the emergence of terrorism.

Broadly, narratives used in recruitment and radicalization define the in-group, define the out-group (culprits), define how grievances are a result of the existence of the out-group and set the conditions for the level of hostility or violence that must be aimed at the out-group.[19] As each of these conditions is further determined, the possibility for escalation to violence increases as negative views of the out-group rise and the justification for violence is conveyed.

Escalation to violence or terrorist activity often depends upon the strength of a *terrorism-justifying ideology* within a radicalization pathway.[20] Terrorism-justifying ideology instructs groups and individuals on radicalization into violent extremism pathways towards escalatory acts of violence and terror.[21] In other words, it ultimately grants a license to violence and sets the conditions for the perceived allowability of terrorism. Terrorism-justifying ideology contains three essential characteristics:

▶ **Grievances** believed to be suffered by one's in-group;
▶ **Culprits** presumed responsible for perpetrated grievances, often identified as a perceived out-group or out-group member; and
▶ **Narratives** that interpret violence as a morally warranted and effective method of resolving grievances, often through acts of terror.

Presently, there is weak evidence that climate change is employed in recruitment and radicalization narratives of VEOs as well as employed in terrorism-justifying ideology.[22] Of course, this does not mean that climate change and the environment have not served as ideological drivers in past eco-terrorism and environmental terrorism movements (see Rapid Review #2). Rather, it reflects the present evidence that while climate change is itself a grievance and culprits can be identified (e.g., extractive industries, governments, climate change deniers, etc.) the strength of climate change in a terrorism-justifying ideology within current VEOs' narratives is lacking.

However, the extensive range of grievances exacerbated by climate change poses a greater opportunity for VEOs to develop new communication strategies to extend the grounds for recruitment (see Rapid Review #1). Additionally, the growth of climate activism globally presents the potential to trigger groups and actors to radicalize and develop a potentially violent climate change motivated extremism.[23]

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[17] Braddock & Horgan 2016.

[18] Ibid, 381.

[19] Berger, J.M. 2018. *Extremism*. MIT Press; Braddock, Kurt, and John Horgan. 2016. "Towards a guide for constructing and disseminating counternarratives to reduce support for terrorism." *Studies in Conflict & Terrorism* 39(5): 381-404.

[20] Kruglanski, Arie W., Michele J. Gelfand, Jocelyn J. Bélanger, Anna Sheveland, Malkanthi Hetiarachchi, and Rohan Gunaratna. 2014. "The psychology of radicalization and deradicalization: How significance quest impacts violent extremism." *Political Psychology* 35: 69-93.

[21] Ibid.

[22] Spadaro, Paola Andrea. "Climate Change, Environmental Terrorism, Eco-Terrorism and Emerging Thr*eats." Journal of Strategic Security* 13, no. 4 (2020): 58-80.

[23] Macaskill, Andrew and M, Muvija. 2022. Climate activists promise daily protests after blocking 10 UK oil terminals. Accessed 1 April 2022. https://www.reuters.com/world/uk/climate-protesters-block-10-uk-oil-terminals-six-people-arrested-2022-04-01/.

Climate Change Effects on Terrorist Recruitment

There is a vast range of socioeconomic, political, and ideological strategies and non-violent and violent tactics used by VEOs to enlist new members and build supportive bases.[24] Regardless of the numerous strategies and tactics employed, all VEOs must recruit new members and sympathizers to stay relevant and operate effectively.[25] Generally, there are three common conditions that most VEOs employ to recruit members:

▶ **Financial incentives:** to lure individuals impacted by increasing economic insecurity and vulnerability with promises of economic welfare.
▶ **Kinship:** the influence of common identity characteristics, communal bonds, ideology, social cohesion, religion, and their exploitation for conscription.
▶ **Political and cultural history:** competing political and cultural narratives and experiences that create suspicion across different divides (religion, ethnicity, nationality, etc.) in society that are exploited.

Simply put, terrorist recruitment at its most fundamental level requires defining the in-group and creating **in-group cohesion**: identity grouping defined by shared beliefs, traits, and practices (including behavior) which set the parameters for in-group eligibility, and thus potential recruitment.[26] While the connections between climate change and terrorist recruitment are under-researched, several discernible climate change effects on terrorist recruitment are already occurring in predominantly climate-vulnerable and politically fragile contexts that are worth noting:

"As climate change increasingly exacerbates livelihood insecurity VEOs are already employing recruitment techniques that offer socioeconomic stability."

1) As climate change increasingly exacerbates livelihood insecurity VEOs are already employing recruitment techniques that offer socioeconomic stability. For instance, Boko Haram has expanded its recruiting efforts in northern Nigeria and Cameroon by offering recruits monthly salaries that are ten times the minimum wage ($600-$800) in the region that suffers endemic underemployment (as high as 75 percent).[27]

2) Climate change will increasingly stress agricultural and fishing sectors decreasing their sustainability and prompting new migratory patterns. In Morocco rural to urban migration has rapidly increased the rate of urbanization, particularly slum development on the outskirts of Casablanca, Tangiers, and Tétouan. The existence of these slum areas has been linked to a growth in violent extremism in the country.[28] For instance, two-thirds of Moroccan foreign terrorist fighters who joined IS in Iraq and Syria are originally from the slum development in Tangiers.[29]

3) Increasing frequency, intensity, and duration of climate shocks that negatively impact food and water security are likely making it easier for VEOs to recruit in climate fragile contexts. It is

[24] Faria, João Ricardo, and Daniel G. Arce M. 2005. "Terror support and recruitment." *Defence and Peace Economics* 16(4): 263-273; Neumann, Peter. 2012. *Joining al-Qaeda: jihadist recruitment in Europe*. Routledge; Bloom, Mia. 2017. "Constructing expertise: Terrorist recruitment and "talent spotting" in the PIRA, Al Qaeda, and ISIS." *Studies in Conflict & Terrorism* 40(7): 603-623.

[25] Ranstorp, Magnus. 2010. *Understanding violent radicalisation: terrorist and jihadist movements in Europe*. Routledge.

[26] Berger 2018.

[27] Cullen S. Hendrix and Jessica Anderson, *Resilience and Food Security Amidst Conflict and Violence: Disrupting a Vicious Cycle and Promoting Peace and Development* (Washington, DC: USAID, 2021).

[28] Masbah, Mohammed. 2015. 'Moroccan Foreign Fighters - Evolution of the Phenomenon, Promotive Factors, and the Limits of Hardline Policies'. Berlin: *SWP* (Stiftung Wissenschaft und Politik).

[29] Ibid.

estimated that 60 to 70 percent of local IS fighters in Iraq and Syria were recruited as a result of poor policy planning and a lack of adaptation strategies during major droughts.[30]

4) The negative consequences of climate change in climate fragile contexts further strain the relationship between different population groups and governments. As this relationship deteriorates, VEOs foster radicalization narratives of alienation and abandonment aimed to weaken government legitimacy and recruit vulnerable individuals exhibiting political frustration. For instance, in the border regions of Mali, Burkina Faso, and Niger VEOs, like Katiba Macina and Al-Qaeda in the Islamic Maghreb (AQIM), actively present themselves as alternatives to weak governments.[31]

5) Climate change will impact resource competition increasing the value of certain resources. In politically fragile contexts, VEOs aim to strategically capture and control resources and their markets fully, or partially, to financially support operational functions requiring recruited labor. For example, Jama'a Nusrat ul-Islam wa al-Muslimin (JNIM) and other VEOs are seizing gold mines in Senegal to exploit market chains to profit, and similarly in Somalia, Al-Shabaab exploits charcoal mining.[32]

Other climate change effects on terrorist recruitment that have been discussed but, to date, have not explicitly come to fruition relate to the unintended effects of climate change policy:[33]

6) Climate change mitigation discussions and policy frameworks have sown division between developed economies, which are most resilient to climate change, and developing or under-developed economies that are least resilient to climate change. VEOs can exploit this division to recruit vulnerable individuals in developed economies to carry out attacks.

7) Climate change mitigation regimes predominately target carbon emissions and require the decarbonization of energy systems which involves a massive global energy transition. This energy transition may impact the stability of states that rely on extractive economies (e.g., Saudi Arabia and the other Gulf States, Ghana, Venezuela, etc.). VEOs can exploit this instability but, more importantly, will need to adapt to a financial future where funding from extractive industries/economies is not sustainable. Funding links between the Gulf States and VEOs are fairly well known.[34]

In the near term, climate change itself is unlikely to serve as a recruitment or radicalization strategy or tactic. Although climate change exacerbates underlying conditions conducive to radicalization to violent extremism, other options to overcome them exist, apart from terrorism. Yet, as a threat multiplier, climate change has and will continue to produce recruiting opportunities for VEOs in climate-vulnerable and politically fragile contexts. Furthermore, climate change will continue to aggravate political and socioeconomic weaknesses that will likely make current or future VEOs more capable or likely to emerge.[35]

[30] Leggiero, Katherine. 2015. "Countering ISIS recruitment in western nations." *Journal of Political Risk* 3(1).
[31] Paulin Maurice Toupane, Adja Khadidiatou Faye, Aïssatou Kanté, Mouhamadou Kane, Moussa Ndour, Cherif Sow, Bachir Ndaw, Tabara Cissokho and Younoussa Ba. 2021. "Preventing violent extremism in Senegal: Threats linked to gold mining." *ISS West Africa Report* 2021, no. 36: 1-34.
[32] Petrich, K. (2019). Cows, Charcoal, and Cocaine: Al-Shabaab's Criminal Activities in the Horn of Africa. *Studies in Conflict and Terrorism*. https://doi.org/10.1080/1057610X.2019.1678873
[33] Lukas Rüttinger et al., *A New Climate for Peace: Taking Action on Climate and Fragility Risks: An Independent Report Commissioned by the G7 Members* (Germany: Adelphi, 2015), https://www.newclimateforpeace.org/#report-top.
[34] Realuyo, Celina 2015. "Combating Terrorist Financing in the Gulf: Significant Progress but Risks Remain." *The Arab Gulf States Institute in Washington;* Le Billon, Philippe, and Fouad El Khatib. 2004. "From free oil to 'freedom oil': Terrorism, war and US geopolitics in the Persian Gulf." *Geopolitics* 9(1): 109-137.
[35] Hendrix, Cullen. 2021. "Climate Change and Terrorism: Three Risk Pathways to Consider". *The Center for Climate Security.*

Weaponizing the Climate Change and Terrorism

VEOs frequently use a range of conventional and non-conventional means to attack, coerce, intimidate, and weaken their opponents to induce widespread terror. Among the list of tactics adopted by VEOs, the use of the environment and its natural resources as either a target or a weapon to pursue strategic aims requires greater attention as climate change intensifies. Targeting or weaponizing the environment and its related infrastructure as a strategy has a long history in both conventional and asymmetric conflicts.[36] The majority of research in this topic area focuses on water resources and systems and offers a guiding framework.[37] The capture, control, destruction, sabotage, and/or looting of the environment, more broadly, is growing into a more serious threat as climate change continues to compound environmental risks.

As the strategic importance of vital environmental resources grows so does their appeal to VEOs. VEOs may exploit the effects of climate change as a means to coerce populations by exercising tactics that

> *"The threat of VEOs targeting or weaponizing the environment is considered more dangerous as the results tend to be more widespread and long-lasting."*

cause physical and economic harm to infrastructure and services or choose to strategically control such resources. Furthermore, the threat of VEOs targeting or weaponizing the environment is considered more dangerous as the results tend to be more widespread and long-lasting.[38] For example, between 2013 and 2015 the Islamic State (IS) captured large dams at Falluja, Mosul, Samarra, and Ramadi to strategically control critical water supplies.[39] IS chose to flood or disrupt water supplies of areas and populations that opposed them and reallocate to areas and populations that offered IS support. Thus, it is clear that the environment and its resources can be used as both a weapon and a target in the strategic and tactical considerations of VEOs.

To best evaluate the threat of environmental tactical considerations it is important to examine the *intent* of VEOs actors for potentially using the environment and its resources as a tactic or target relative to the *capability* for actors to do so. Intent pertains to why and to what purpose VEOs would use or target the environment whereas capability refers to the characteristics of the environment where VEOs operate. In other words, the *motives* and *means* to carry out terrorism must align. The increased severity and frequency of climate change may offer more opportunities for VEOs to decide to strategically use or target the environment as a means to exploit or control populations. VEOs' motives and decision-making in fragile climate contexts can be divided into three broad, yet interrelated categories:

▶ **Operational or strategic motives**: instrumental decisions whereby the use of the environment or environmental conditions allow the pursuit of strategic and tactical ends. For instance, capturing or destroying environmental resources to undermine political and socioeconomic structures.
▶ **Organizational motives**: structural decisions which enhance the groups' position, legitimacy, and authority relative to their opponents. For example, manipulating weakened government capacity to respond to a climate shock by fostering radicalization narratives of alienation and abandonment.

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[36] Hastings, Tom H. *Ecology of war & peace: Counting costs of conflict*. University Press of America, 2000.
[37] Gleick, Peter, and Matthew Heberger. 2014. "Water conflict chronology." In *The world's water*, pp. 173-219. Island Press, Washington, DC; Gleick, Peter. 1993. "Water in crisis." *Pacific Institute for Studies in Dev., Environment & Security. Stockholm Env. Institute, Oxford Univ. Press. 473(9)*: 1051-076.
[38] Spadaro, Paola Andrea. 2020. "Climate change, environmental terrorism, eco-terrorism and emerging threats." *Journal of Strategic Security* 13(4): 58-80.
[39] von Lossow. Tobais. 2016. "Water as a Weapon: IS on the Euphrates and Tigris. The Systematic Instrumentalisation of Water Entails Confronting IS Objectives*", Stifung Wissenschaft Und Politick*, SWP Comments 3(2).

▶ **Psychological motives:** decisions based on group or individual extremist ideology aimed to generate fear and anxiety. For instance, exploiting increased livelihood insecurity as a means of recruitment or to induce terror.

The decision-making process for VEOs' to target the environment and/or resources and related infrastructure depends on a range of physical characteristics such as the level of scarcity or abundance of a resource in a given area, location of resources, vulnerability to attack as well as the impact of the attack (i.e. capacity for regeneration).[40] The more essential the resource is in supporting human systems the greater its target value becomes. Additionally, this point extends to ancillary resource-related targets such as people associated with resource management and infrastructure (e.g., damns, pipelines, computing systems, etc.).

Targeting the environment or resources is not only a devastatingly destructive act aimed to spread fear, but it also functions to undermine government capacity and legitimacy. For instance, in 2014 Al-Shabaab cut water supplies to cities liberated by the African Union Mission in Somalia (AMISOM) and Somali troops and forced residents to walk to nearby Al-Shabaab-controlled cities.[41] The increasing frequency and severity of climate change will become more complex and more difficult to manage with the growing possibility that VEOs not only strive to target the environment as a means to coerce populations and undermine governments but also seek to weaponize it to foster control, demonstrate power, and earn profit.[42]

If VEOs can successfully exploit increasing levels of scarcity and more pronounced vulnerability of environmental resources, then it is likely that the weaponization of the environment will become more attractive as a strategic, tactical, and coercive practice. Put simply, the scarcer (or more abundant) certain environmental resources become, the more power is given to those who control them. As such, three types of weaponization can be identified:[43]

▶ *Strategic weaponization* entails the actual use of the environment or environmental conditions to consolidate power and exert control and influence over a territory and its population or as an asset to fund operational functions. For example, in October 2014, IS acted to divert the Khalis tributary of the Tigris River to flood large areas of Mansouriya and Diyala provinces and collected (extorted) taxes on the water in areas under IS control.[44]

▶ *Tactical weaponization* entails acts that target the environment to further contribute to socioeconomic or political insecurities, like the purposeful destruction or contamination of vital resources. Often tactical weaponization refers to actions taken by VEOs to target the environment in ways that intentionally disrupt counterterrorism practices. For instance, the Taliban cut electricity lines and destroyed telecommunications infrastructure to slow United States (U.S.) and allied troops.[45] Unfortunately, this type of weaponization often entails significant collateral damage as populations are caught in the middle.

[40] Kohler, Christina, Carlos Denner Dos Santos, and Marcel Bursztyn. 2019. "Understanding environmental terrorism in times of climate change: Implications for asylum seekers in Germany." *Research in Globalization* 1.

[41] Public Radio International, "Al-Shabaab's 'Water Terrorism' is Yielding Results and Tragedymin Somalia's Civil War," April 12, 2014, https://www.pri.org/stories/2014-08-08/how-alshabaab-using-water-tool-terrorism (accessed March 4, 2022).

[42] CNA, "The Role of Water Stress in Instability and Conflict," 2017, https://www.cna.org/CNA_files/pdf/CRM-2017-U-016532-Final.pdf (accessed January 31, 2022).

[43] King 2016.

[44] Hubbard, Benn 2014. "Life in a Jihadist Capital: Order with a Darker Side, ISIS Puts its Vision into Practice in a Syrian City," The New York Times, last modified, http://www.nytimes.com/2014/07/24/world/middleeast/islamic-state-controls-raqqa-syria.html?_r=0.

[45] Kohler et al. 2019, 5.

► *Coercive weaponization* entails acts that use the environment or environmental conditions as an instrument of subjugation. On one hand, VEOs may threaten to target the environment or essential resources to coerce populations to submit to their objectives. On the other hand, VEOs may use the control of key essential resources to enhance their local authority and incentivize or reward populations to submit to their objectives. For example, Boko Haram has been known to offer food security to populations with high levels of food insecurity as a means of subjugation and recruitment.[46]

The weaponization of the environment and resources is more likely to occur in contexts and areas with higher climatic and political fragility and vulnerability. However, that does not preclude contexts and areas with high levels of climate resilience and strong political institutions. For example, in 2000 a nefarious hack of the Maroochy Shire, Queensland Australia waste management system caused millions of liters of raw sewage to contaminate parks, rivers, and canals.[47] Of significant future concern is whether or not environmental and climate change activists will evolve strategies and tactics that weaponize the environment for the protection of the environment or against entities perceived to be harming the environment or contributing to climate change.

In all, it is clear that VEOs understand the benefits (and risks) of actively targeting or weaponizing the environment and that these will continue to play a highly strategic and tactical role in VEOs operational pursuits across the globe. Regrettably, climate change will contribute to the complexity and danger of weaponizing and targeting the environment at the same time the actions of weaponizing and targeting the environment will contribute to increased climate vulnerability.

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[46] Hendrix and Anderson 2021.
[47] Tony Smith, "Hacker Jailed for Revenge Sewer Attacks," The Register, October 31, 2001.
https://www.theregister.co.uk/2001/10/31/hacker_jailed_for_revenge_sewage/ (accessed March 12, 2022).

Bottom Line Summary

Overall, VEOs may exploit the effects of climate change as a means to exert influence over populations by exercising a range of strategic and tactical (capture, control, sabotage, and/or looting) practices to recruit new members and build sympathetic broader publics or subjugate and weaken perceived enemies. Experts in climate change need to understand how climate impacts can influence power dynamics and worsen environmental, political, and socioeconomic vulnerability, while terrorism and conflict experts must grasp the impacts of climate change on local contexts and how violence shapes climate vulnerability, and thus climate resilience and adaptation. Certainly, investigating how and why terrorism forms is a vital approach to preventing future terrorism which may be significantly impacted by climate change.

Recommendations

▶ A limited number of studies have engaged climate change in relation to radicalization into violent extremism models. Thus, further research is needed to understand which push, pull, and personal factors contribute to an escalation towards violence (and acts of terror) in climate fragile contexts.

▶ Evidence of the weaponization of the environment by VEOs exists in regions already experiencing political instability and violent conflict. Future scenario planning models should be employed to determine if, and how, the weaponization of the environment could occur in other contexts.

▶ As climate activism rises across the globe, more research is necessary to determine potential underlying conditions, drivers, and enabling factors that could trigger climate activism groups and actors to radicalize and develop a potentially violent climate change motivated extremism.

Suggested Data Sources

▶ Asaka, Jeremiah O. "Climate Change-Terrorism Nexus? A Preliminary Review/Analysis of the Literature." *Perspectives on Terrorism* 15, no. 1 (2021): 81-92.

▶ Spadaro, Paola Andrea. "Climate change, environmental terrorism, eco-terrorism and emerging threats." *Journal of Strategic Security* 13, no. 4 (2020): 58-80.

▶ Chaturvedi, Sanjay, and Timothy Doyle. *Climate terror: A critical geopolitics of climate change*. London: Palgrave Macmillan, 2015.

▶ Rosa, Eugene A., Thomas Dietz, Richard H. Moss, Scott Atran, and Susanne Moser. "Managing the risks of climate change and terrorism." *Solutions* 3, no. 2 (2012): 59-65.

▶ Dalby, Simon. "Climate change: new dimensions of environmental security." *The RUSI Journal* 158, no. 3 (2013): 34-43.

ABOUT THIS RAPID REVIEW

ABOUT START

The National Consortium for the Study of Terrorism and Responses to Terrorism (START) is a university-based research, education and training center comprised of an international network of scholars committed to the scientific study of terrorism, responses to terrorism and related phenomena. Led by the University of Maryland, START is a Department of Homeland Security Emeritus Center of Excellence that is supported by multiple federal agencies and departments. START uses state-of-the-art theories, methods and data from the social and behavioral sciences to improve understanding of the origins, dynamics and effects of terrorism; the effectiveness and impacts of counterterrorism and CVE; and other matters of global and national security. For more information, visit www.start.umd.edu or contact START at infostart@umd.edu.

CITATION

Annex: A Climate of Terror?
Approaches to the Study of Climate Change and Terrorism

GLOSSARY OF TERMS

Rather than explicate the longstanding definitional debates in and around security, terrorism, and climate change where little consensus converges,[1] we recognize that our key concepts have many useful definitions and characteristics. The terms below are defined within the context of extremism. We provide pragmatic working definitions of each key concept that can serve as the basis for operational responses by many different institutions.

Climate Change: A change of climate which is attributed directly or indirectly to human activity that alters the composition of the global climatic system which is in addition to natural climate variability observed over comparable time periods.[2]

Climate Variability: Refers to variations in the state of the climate at all spatial and temporal scales beyond that of individual weather events. Variability may be due to natural internal processes within the climate system (internal variability), or to variations in natural or anthropogenic external forcing (external variability).

Climate Shock: The occurrence of a value of a weather or climatic variable above (or below) a threshold value near the upper (or lower) ends of the range of the observed values of the variable. Also known as "climate extremes", climate shocks are generally climatological disasters (e.g., hurricanes, droughts, floods, earthquakes) that influence climate variability in a given location and over a specific short time frame but may have long term impacts as well.

Climate Pressure: Refers to anthropogenic external forcing variations in the state of the climate at spatial and temporal scales beyond individual weather events over a long period of time.

Human Security: The safeguarding of the vital core of all human lives and human well-being from critical pervasive threats in a way that is consistent with long-term human fulfillment.[3]

In this working definition, the vital core of human lives includes the "universal and culturally specific, material and non-material elements necessary for people to act on behalf of their interests."[4] Poverty, discrimination, and extreme natural disasters are key threats that undermine human security.

Extremism: The belief that an in-group's—a group organized around a shared identity—success, or survival can never be separated from the need for hostile action against a perceived out-group—a group of individuals who are excluded from a specific in-group.[5]

Radicalization: The process by which individuals come to believe that their engagement in or facilitation of violence to achieve social and political change is necessary and justified.[6]

Radicalization into Violent Extremism: The escalation of an in-group's extremist orientation in the form of increasing negative views about a perceived out-group or the endorsement of increasingly hostile or violent actions against a perceived out-group.[7]

Resilience: The ability of environmental, social, and economic systems and their component parts to anticipate, absorb, accommodate, or recover from the effects of a hazardous event (e.g., climate shock or terrorist act) in a timely and efficient manner, including through ensuring the preservation, restoration, or improvement of its essential basic structures and functions.[8]

Terrorism: A strategic and tactical (in)discriminate exercise of violence, or threat of an exercise of violence, against members of a target group, including both civilians and combatants, to engender psychological repercussive states extending the proximity and intensity of violence in ways that may be exploitive and advantageous to the advancement of a contextualized agenda.[9]

From a quantitative methodological perspective, the Global Terrorism Database (GTD) offers the following definition of terrorism amenable to quantitative data analysis: "the threatened or actual use of illegal force and violence by a non-state actor to attain a political, economic, religious, or social goal through fear, coercion, or intimidation".[10]

Terrorism-Justifying Ideology: Instructs individuals on radicalization pathways towards escalatory acts of violence and terror. Contains three characteristics: 1) grievance believed to be suffered by one's in-group; 2) culprits presumed responsible for the perpetrated grievance, often identified as a perceived out-group or out-group member; and 3) interpreted morally warranted and effective method of resolving the grievance, often through acts of terror.[11] In other words, terrorism-justifying ideologies set the stage for the perceived allowability of terrorism.

Violent Extremism: The belief that an in-group's success or survival can never be separated from the need for violent action against a perceived out-group.[12]

Vulnerability: The propensity or predisposition to be adversely affected. In relation to climate change vulnerability can be broken down into three dynamics: 1) exposure to climate change; 2) sensitivity to climate change; and 3) adaptive capacity.[13] In relation to terrorism, vulnerability is understood as an individual or group's propensity or predisposition to be recruited into a radicalization pathway by extremist ideology.

CONCEPT MAPPING

Although there are multiple, concurrent conceptual frameworks for engaging the climate-security-nexus and our climate change and terrorism interaction areas, our focus aims to be pragmatic. As such, we developed a concept map that offers a logic model to unpack the complex web of conceptual relations between climate change, conflict, and terrorism (and their component parts) developed from our initial findings (Figure 1). Concept mapping is a structured process that integrates knowledge to produce an interpretable pictorial view of concepts and their interrelatedness.[14] Our structured approach involved three steps based on our initial findings: 1) *generation* of the conceptual domains; 2) *structuring* of the conceptual domains; and 3) *representation* of the conceptual domains.

The generation of conceptual domains resulted from the initial analysis and synthesis process (see methodology section). Confidence in our initial findings is grounded in an evaluation of the underlying evidence discovered during the data collection and screening and collaborative peer-review processes. All concepts are supported and traceable to source data. Invariably, assessing climate change and terrorism conceptually involves navigating significant uncertainties. Generating pragmatic working definitions of our key concepts aims to address these uncertainties.

The structuring of conceptual domains began with the premise that climate change, conflict, and terrorism are multidimensional and multi-scalar phenomena. The relationships and feedback loops within these coupled systems cross sociospatial scales (macro, meso, and micro levels). Engaging differing scales of analysis focuses on the evidentiary interactions among climate change, conflict, and terrorism connecting large-scale patterns and societal trends to individual experiences across geographic space. Determining the level of analysis for each concept is based on the United Nations (UN) Conceptual Approach to Integrated Climate-Related Security Risks Assessments, which analytically distinguishes levels of analysis between livelihood-centric (micro), complex systems (meso), and systemic trend dynamics (macro).[15]

The representation of conceptual domains within the climate-security-nexus is designed to illustrate the ways climate change interacts with existing environmental, political, and socioeconomic factors and contexts that produce insecurities that may result in conflict (or not) or worsening fragile contexts where the preconditions and precipitants of terrorism may be activated. The concept map offers a simplified representation of the complex interplay between climate change, conflict, and terrorism. The interlinkages that manifest between them are represented by connective lines. Feedback loops that indicate mutually reinforcing relationships are represented by the block and line arrows.

Figure 1: Climate-Security-Nexus Concept Map
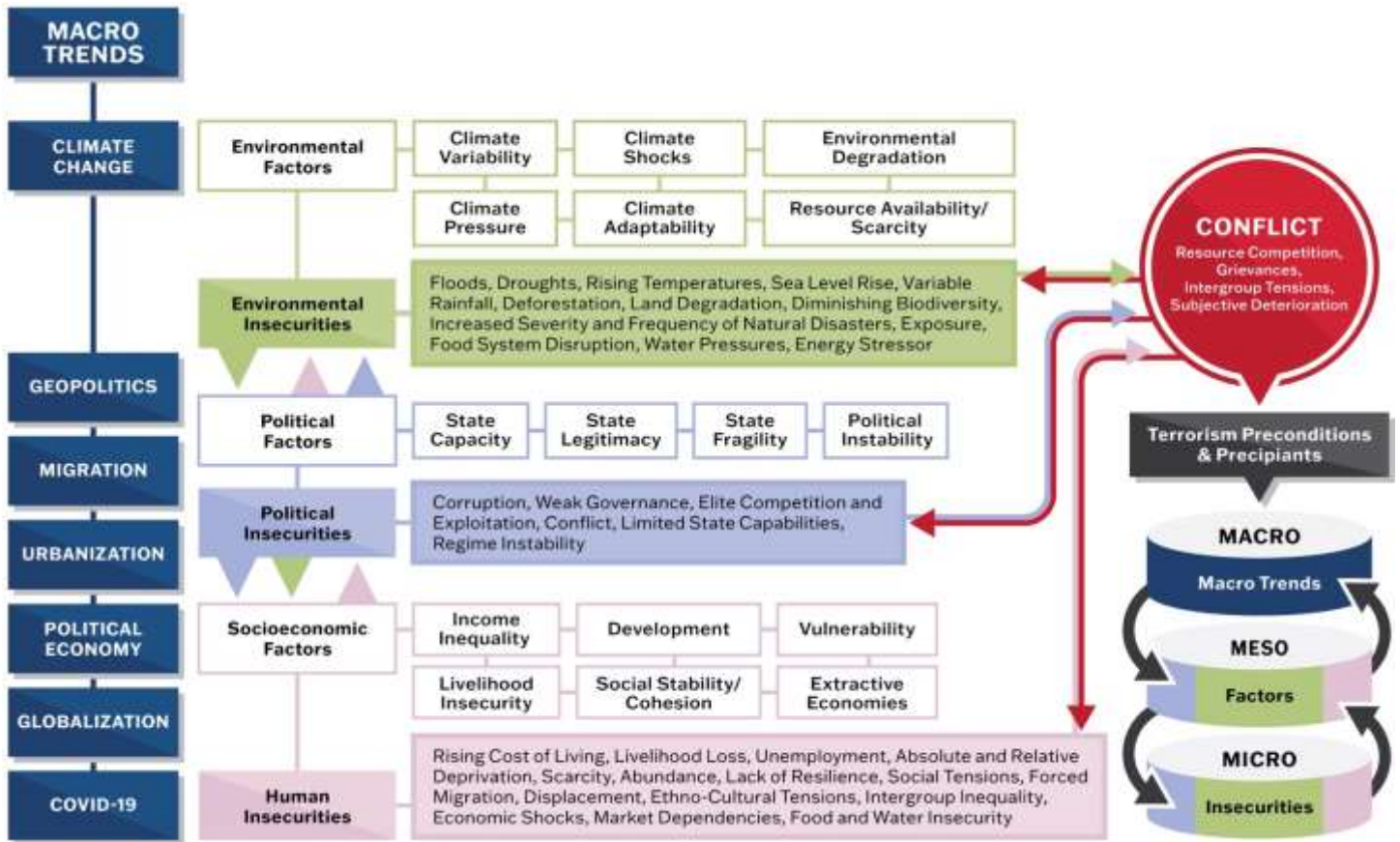
Macro Trends: Refers to pervasive and persistent global phenomena that act as forces of change impacting current environmental and human systems operations.

Factors: Refers to forces, processes, and phenomena that produce and shape, and are shaped by, connections between macro trends and insecurities of current environmental and human systems operations.

Insecurities: Refers to forces, processes, and phenomena that threaten everyday life chances increasing vulnerabilities in current environmental and human systems operations.

Clearly, there are many different types of potential interactions between climate change, conflict, and terrorism based on our concept mapping. As such, robust theoretical and methodological considerations must be taken into account for a given context, acknowledging that potential interactions between concepts are not deterministic nor direct.

METHODOLOGY

To execute our systematic scoping review of the three climate change and terrorism interaction areas we employ a custom rapid review approach. Rapid reviews have emerged as an efficient and structured approach to synthesizing a corpus of evidence promptly to inform policy and practice. As such, they offer contextualized products that succinctly and methodically address a broad scope of research evidence quickly.[16] We recognize the limitations associated with accelerated synthesis methodologies and acknowledge that rapid reviews cannot claim comprehensive coverage.[17] Given our limited time frame and advancements in rapid review methodology, we aim to conduct evidence synthesis where the level of rigor is maintained by a highly transparent and structured approach. As such, our approach to conducting our three rapid reviews adapts the methodology from the Cochrane Rapid Reviews Methods Group (RRMG) for a social science context.[18] Privileging evidence-informed thinking, our approach seeks to map relevant, available evidence in each interaction area (Table 1).

Table 1: Rapid Reviews Approach

STEPS	DETAILS
Setting the Scope Criteria (Topic Refinement)	Involve key stakeholders to set and refine the review topics, research questions, and the outcomes of interest. • Results include identifying the three climate change-interaction areas
Setting Eligibility Criteria	Define the boundaries for literature/evidence inclusion in each rapid review. • Boundaries include limitations on types of literature (empirical studies, case studies, academic articles, policy documents, news articles, and grey literature), forms of terrorism and conflict, time periods, and data sets. o Criteria also include an appraisal of the overall quality of research based on the strength of theoretical framework, empirical assessments, methods, the impact factor of the journal for scholarly articles, number of citations received, and date of publication with recent work prioritized. • Taking into account the under-researched area of climate change and terrorism we include wider climate-conflict-nexus and climate-security-nexus research in our eligibility criteria.

Search	Conduct systematic searches in Google Scholar, University of Maryland's Library repositories, and LexisNexis.
	• Search strings were based upon the scope and key concepts identified during the previous step and iteratively updated based on further review of the literature.
	    o Initial Boolean search terms included: "climate change" AND terrorism, "climate change" AND violent extremism, "climate change" AND terror, "climate change" AND violence, "climate change" AND conflict, "climate change" AND violent conflict, "climate change" and radicalization, "environment" AND terrorism, "environment" AND violent extremism, "environment" AND terror, "environment" AND violence, "environment" AND conflict, "environment" AND violent conflict, "environment" AND radicalization, Climate AND insecurity, Climate AND Terrorism, Climate AND violence, Climate-conflict-nexus, Climate-security-nexus, Environmental Terrorism, Eco-Terrorism.
	    o Rapid review-specific Boolean search terms were employed after the initial search strings were conducted but resulted in few new texts.
	• Screened studies recommended by experts and checked references of key studies as part of a backward snowballing process.
	• Further targeted searches for specialized databases including the Climate Change Knowledge Portal, Global Terrorism Database (GTD), Armed Conflict Location Event Data (ACLED), Fragile State Index (FGI), among others were conducted (see Data Repository)
	• Further targeted searches were conducted aimed at governments, climate change relevant and terrorism organizations (e.g., United Nations), research centers, and media outlets.

Screening and Selection	Screening and data selection using predefined eligibility criteria. • A total of 251 texts were included in the final analysis. • Selected texts were published between 1981 to 2021, with the majority of texts published post-2012, a representative timeframe for both climate change and terrorism research. • Some literature and data were selected inductively to refine the conceptual framework as well. • Collaborative peer-review among researchers aimed to increase confidence in data selected and screened.
Analysis and Synthesis	Analysis and synthesis consist of several overlapping stages: 1) familiarization with current research and evidence base relating to climate change and conflict/terrorism, 2) content analysis to determine the most prevalent themes, 3) discussion between researchers about themes and ongoing findings, 4) development of conceptual framework and concept map, 5) interpretation analysis based on the conceptual framework, and 6) write up of analysis

Review	Peer review by participating researchers and START's Research Director for quality control and review by stakeholders to ensure project objectives are met.
Dissemination	Final dissemination of rapid reviews.

Overall, rapid reviews are an emerging methodology within the broader knowledge synthesis catalog that offer stakeholders and decision-makers access to evidence summaries that 1) map the extant evidence-base of an issue; 2) serve as an informative brief that prepares stakeholders for a discussion on an issue; and, 3) support the development of strategic frameworks for decision-making. While research remains ongoing, our experience to date indicates that our rapid review approach is effective in addressing the needs of this scoping study.

DATA REPOSITORY

As previously discussed, advances in data availability and fidelity have increased the potential to advance both theoretical and empirical research on climate change and terrorism interactions. As such, the following datasets and sources collated during the screening and section process offer relevant sources of data to expand and better analyze the current evidence base in each interaction area. This list is non-exhaustive and will continue to develop as the research program continues.

Table 2: Climate-Security-Nexus Data Sources

DATA SET/SOURCE	AVAILABILITY
Terrorism and Conflict Data Sources	
The Global Terrorism Database (GTD)	https://www.start.umd.edu/gtd/
The Armed Conflict Location & Event Data Project (ACLED)	https://acleddata.com/data-export-tool/
The Uppsala Conflict Data Program (UCDP)	https://ucdp.uu.se/
International Terrorism: Attributes of Terrorist Events (ITERATE)	Request at: https://find.library.duke.edu/catalog/DUKE003907585
The Fund for Peace: Fragile State Index (FSI)	https://fragilestatesindex.org/analytics/
PRIO Conflict Recurrence Database	https://www.prio.org/data/31
RAND Memorial Institute for the Prevention of Terrorism and RAND Database of Terrorism Incidents (MIPT-RDWTI)	https://www.rand.org/nsrd/projects/terrorism-incidents.html
International Terrorism: Attributes of Terrorist Events (ITERATE)	https://databases.lib.utk.edu/ITERATE/
World-Wide Incidents Tracking System (WITS)	U.S. Department of State
Terrorism in Western Europe: Events Data (TWEED)	https://old.datahub.io/dataset/terrorism-in-western-europe---events-data-tweed
Climate Change Data	
United Nations Environment Program (UNEP): Environment Live/World Environment Situation Room	https://wesr.unep.org/

The Intergovernmental Panel on Climate Change (IPCC)	https://www.ipcc.ch/data/
World Bank Climate Knowledge Portal	https://climateknowledgeportal.worldbank.org/download-data
World Meteorological Organization (WMO) Global Framework for Climate Services	https://gfcs.wmo.int/
World Bank's Global Facility for Disaster Reduction and Recovery (GFDRR): Think Hazzard!	https://thinkhazard.org/en/
World Food Program (WFP) Automatic Disaster Analysis & Mapping (ADAM)	Subscribe at: https://geonode.wfp.org/adam.html
United Nations and European Commission's Global Disaster Alert and Coordination System (GDACS)	https://www.gdacs.org/
UNEP-DHI Centre: Flood and Drought Portal	https://www.unepdhi.org/flood-and-drought-portal-2/
Climate Vulnerability Data Sources	
UN International Organization for Migration (IOM): Displacement Tracking Monitor	https://dtm.iom.int/
UN IOM: Migration Data Portal	https://www.migrationdataportal.org/data?i=stock_abs_&t=2020
WFP: Vulnerability Analysis and Mapping (VAM)	https://dataviz.vam.wfp.org/
UNDRR: DesInventar	https://www.desinventar.net/
UN Department of Economic and Social Affairs Data	https://www.un.org/en/development/desa/categories/statistics.html
United Nations Office for Disaster Risk and Reduction (UNDRR): Disaster Risk Profiles	https://www.undrr.org/
Notre Dame Global Adaptation Initiative	https://gain.nd.edu/our-work/country-index/
Environmental Justice Atlas	https://ejatlas.org/

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