

RESEARCH BRIEF

Planning for an Uncertain Future

WHAT CLIMATE-RELATED CONFLICT COULD MEAN FOR U.S. CENTRAL COMMAND

Key Findings

- Nearly the entire U.S. Central Command (CENTCOM) area of responsibility (AOR) faces the compounding effects of accelerating high temperatures, drought, and long-term dryness.
- Causal pathways from climate events to armed conflict are multistep processes in which climate hazards compound governance and socioeconomic grievances.
- According to modeling by RAND Corporation researchers, the CENTCOM AOR will experience substantial conflict in the coming half century. However, that modeling might be underestimating the impact of climate variables on conflict.
- China and Russia have climate-related tools to leverage in relationships with regional countries.
- Because the causal pathways from climate hazards to conflict revolve around political and economic concerns, CENTCOM will likely play a supporting role to interagency partners.
- Supporting partner resilience to climate hazards will strengthen partnerships within the CENTCOM coalition and mitigate conflict risk.

THE MIDDLE EAST AND CENTRAL ASIA are projected to become hotter and drier, with reduced access to fresh water, resulting from climate change. The leadership of U.S. Central Command (CENTCOM) is concerned that these changes could lead to greater conflict in its area of responsibility (AOR). CENTCOM leaders asked the RAND Corporation to help them better understand the role that a changing climate plays in regional stability, the effects of climate change on human systems, and how to mitigate potential threats that could arise from climate change. For example, within the CENTCOM AOR, extreme temperatures and water scarcity during the summer months contributed to significant civil unrest in Basra, Iraq, from 2018 to 2022. Simmering disputes over the Grand Ethiopian Renaissance Dam could escalate fresh water competition between Egypt and Ethiopia into conflict.

These impacts from climate hazards are anticipated to continue to spill over into the security environment, changing the character of intrastate conflict in the region and creating demand for stabilization operations, noncombatant evacuation operations, and humanitarian assistance and disaster relief (HADR). CENTCOM's interest in addressing climate stress in the AOR goes beyond preventing and responding to conflict. Adapting to climate change also presents CENTCOM with an opportunity to build partner resilience to climate hazards, with the ancillary benefit of strengthening bonds within the CENTCOM coalition.

Key Recommendations for U.S. Central Command

Elevate nontraditional security cooperation.

Nontraditional security cooperation activities merit greater attention because they address emerging threats, draw on U.S. strength in technological adaptation, and can be leveraged to deepen cooperation within the CENTCOM coalition.

Operations, activities, and investments (OAI) related to climate preparedness and resilience also align with CENTCOM's focus on partnerships and innovation.

Incorporate climate into strategy, planning, and intelligence products.

CENTCOM should incorporate climate analysis into the development of its theater strategy, defense planning products (e.g., operational plans), and intelligence products.

This includes CENTCOM updating contingency plans for HADR and noncombatant evacuation operations.



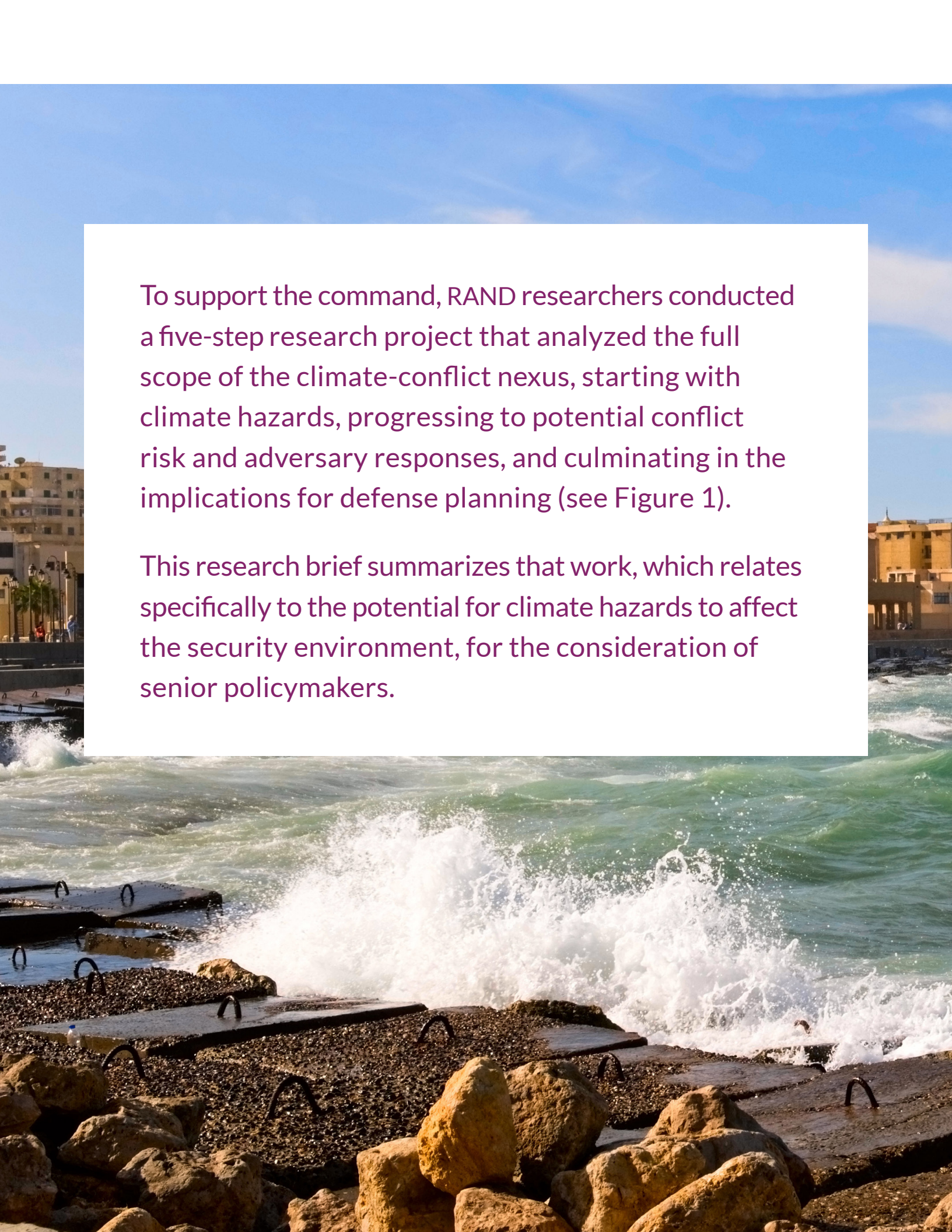


Expand the State Partnership Program.

CENTCOM should request to expand the State Partnership Program within the AOR, particularly with National Guard units that are experienced in responding to climate-related disasters.

Build climate literacy among CENTCOM staff.

CENTCOM would benefit from greater climate literacy at all levels of headquarters staff and forward-deployed personnel, such as security cooperation officers and defense attachés based in the region.

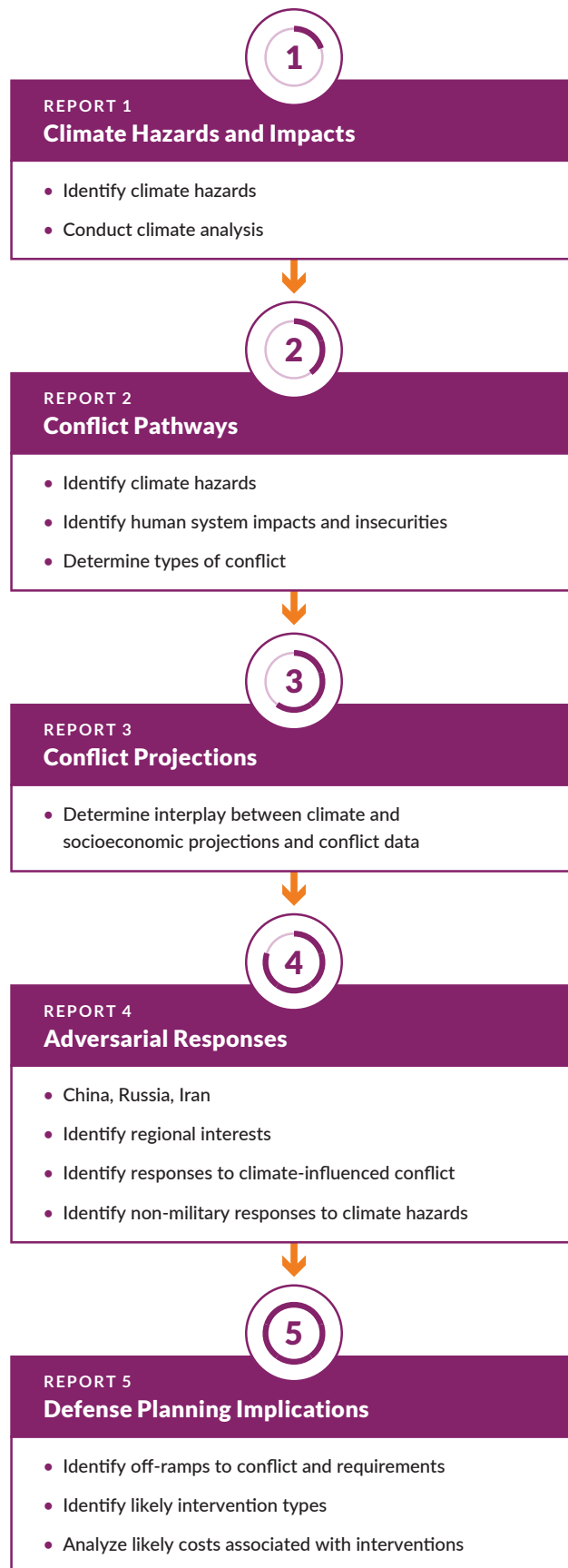


To support the command, RAND researchers conducted a five-step research project that analyzed the full scope of the climate-conflict nexus, starting with climate hazards, progressing to potential conflict risk and adversary responses, and culminating in the implications for defense planning (see Figure 1).

This research brief summarizes that work, which relates specifically to the potential for climate hazards to affect the security environment, for the consideration of senior policymakers.



Figure 1. Research Progression



The Link Between Climate Change and Conflict

Although there is only medium to low confidence among experts about the link between climate change and armed conflict, the Intergovernmental Panel on Climate Change's 2022 report on the topic and the U.S. Intelligence Community's 2021 National Intelligence Estimate and 2023 U.S. Annual Threat Assessment all note the potential for higher levels of conflict, instability (geopolitical tensions or domestic political unrest), and violence related to climate change. However, the reports are more cautious about suggesting that these dynamics would rise to the level of major wars. In general, these official assessments express much more confidence that climate change will be linked to conflict, instability, and violence versus major wars.



Causal Pathways from Climate Change to Conflict

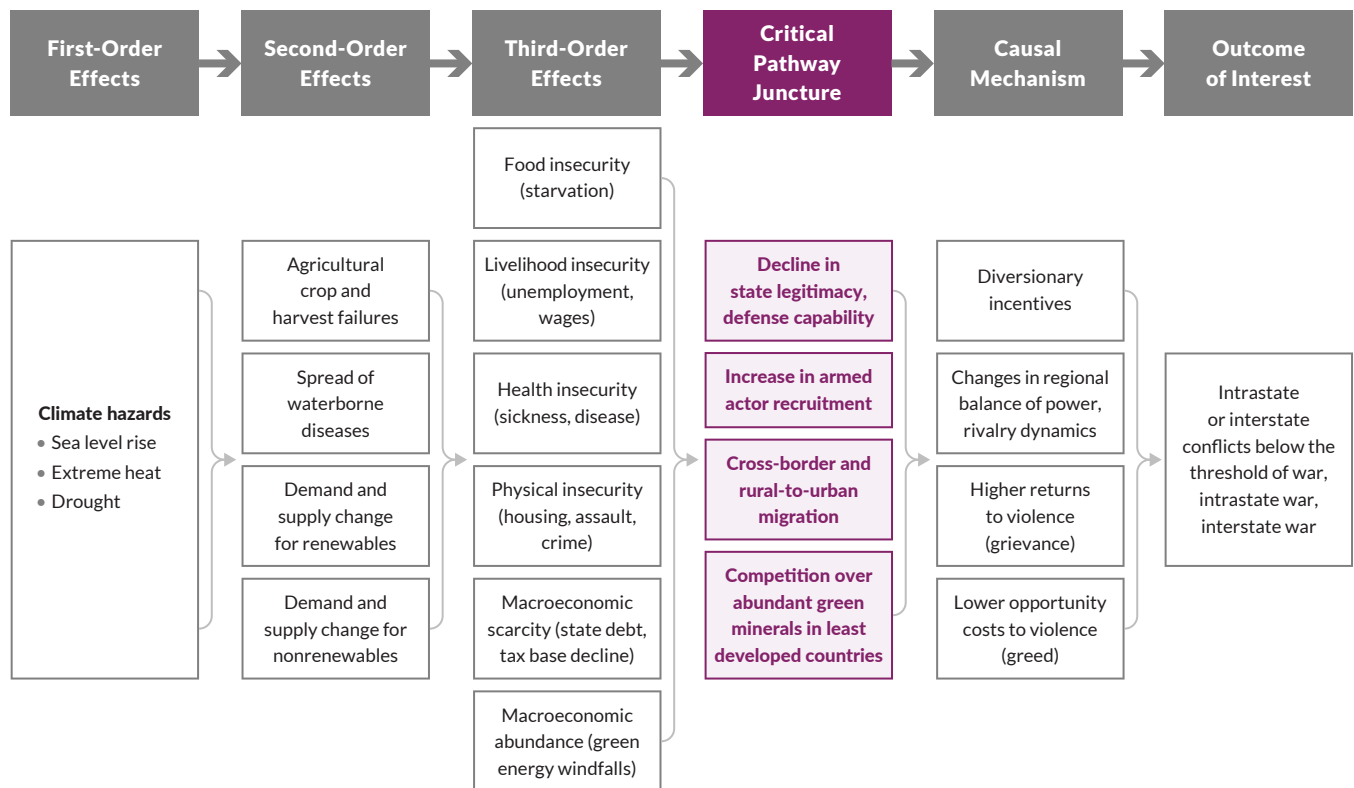
To better understand the link between climate hazards and conflict, RAND analysts examined what existing studies have identified as causal pathways from climate change to conflict. Although climate hazards could have a direct impact on lower-level violence, pathways from climate events to organized conflict are multistep processes in which the initial hazard typically triggers several intervening steps before manifesting in high-intensity conflict (see Figure 2).

Causal pathways from climate hazards to conflict can vary, but often the hazard triggers a form of insecurity that combines with impacts on state capacity, population flows, and other factors. These impacts, when filtered through individual and armed group incentives to mobilize around greed or grievance,

can culminate in conflict. Defense planners should keep in mind that the causal pathways from climate hazards to conflict cannot be reduced solely to resource scarcity, although that mechanism tends to be the most intuitive to this audience.

Causal pathways can aid defense planners in understanding the interaction between non-climate factors and climate hazards that could increase the vulnerability of an area to conflict. For example, RAND’s analysis suggests that extreme heat becomes a more-critical risk factor for conflict when state capacity is too weak to mitigate the impact on human health, when it leads to loss of livelihoods or food insecurity, or when it intersects with existing socioeconomic grievances.

Figure 2. Conceptualization of Six-Step Process from Climate Hazards to Conflict



Climate Change and Conflict Projections in the U.S. Central Command Area of Responsibility

What the previous analysis does not reveal, however, is the projected frequency of future conflict in the CENTCOM AOR. To expand their analysis to plausible patterns of conflict in the AOR during the 2035–2070 period, the RAND team employed a machine learning model that integrates both climate variables (i.e., temperature and precipitation) and socioeconomic variables (e.g., population growth, economic performance) into conflict projections across the AOR at the provincial level. The RAND team also varied the assumptions underlying both the climate and non-climate variables to account for uncertainty in future trajectories.

Under all socioeconomic and climate conditions considered, the CENTCOM AOR will experience substantial conflict in the coming half century. Although there is suggestive evidence that worse climate outcomes will correlate with a greater incidence of conflict between 2040 and 2060, higher temperatures and decreased precipitation are not the major drivers of the future security environment, according to the model. Rather, where these hazards increase conflict risk, they do so by interacting with other variables that are stronger predictors of conflict, including governance and the presence of conflict in a neighboring area in the prior year.

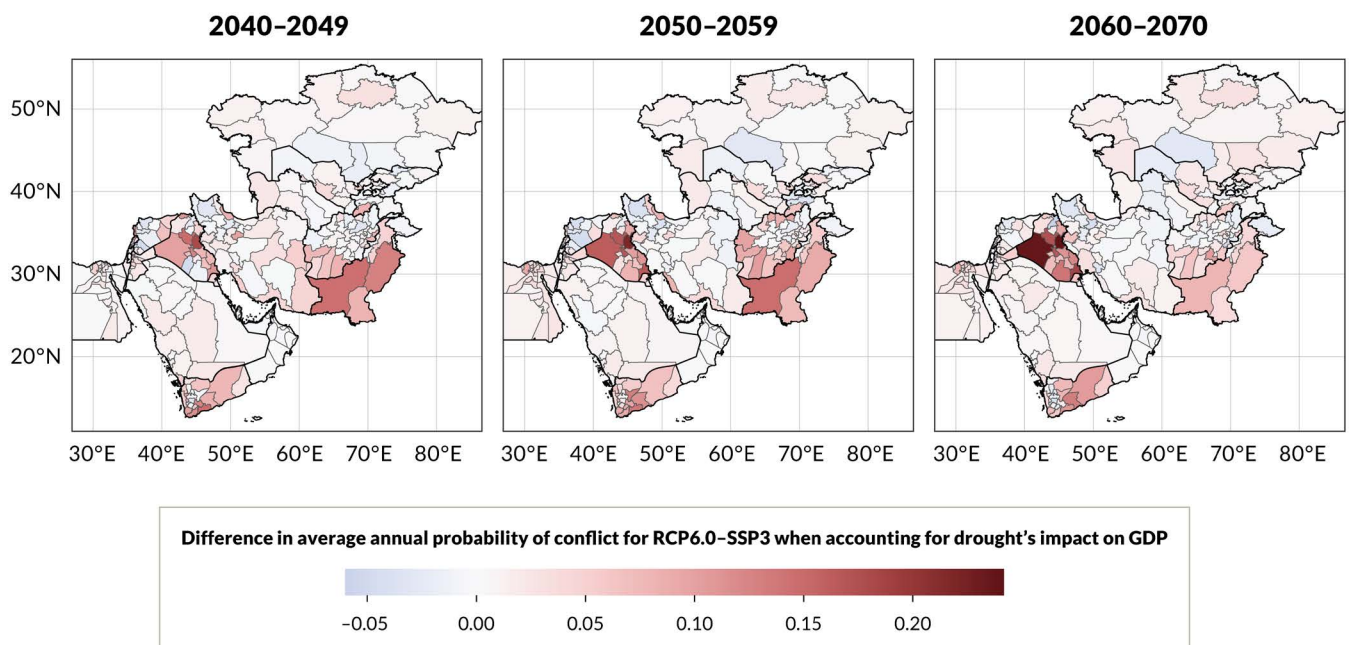
Importantly, there are good reasons to believe that existing research and RAND’s forecasts might be undercounting the

impact of climate variables on conflict. The main limitation of existing research is that inadequate attention is given to the dynamic relationship between climate hazards, the economy, and conflict that could result in negative feedback loops.

Specifically, the presence of conflict limits a state’s ability to adapt to climate change, further increasing its risk of conflict traps (i.e., the tendency of civil conflict to reoccur or spread to neighboring states). Furthermore, climate hazards could suppress economic development, contributing to conflict via socioeconomic conditions. Climate change could also contribute to conditions that shape conflict risk in a manner that is fundamentally different from conditions that characterized the recent past. Finally, climate hazards could—via migration or food price shocks—generate conflict that is far from localized climate impacts or could result in conflict in future periods that would not be captured in some existing research.

To test whether their modeling might be underestimating the strength of the climate-conflict relationship, the RAND researchers undertook an additional modeling effort that factors in the economic impact of drought. After making assumptions grounded in existing research about the impact of drought on the economies of agriculture-dependent areas, the team projected significant increased risk of conflict in those areas (see Figure 3). Military decisionmakers and planners will need to account for such uncertainty in their planning.

Figure 3. Impact of Drought on Conflict Projections



NOTE: GDP = gross domestic product; RCP = Representative Concentration Pathway; SSP = Shared Socioeconomic Pathway.

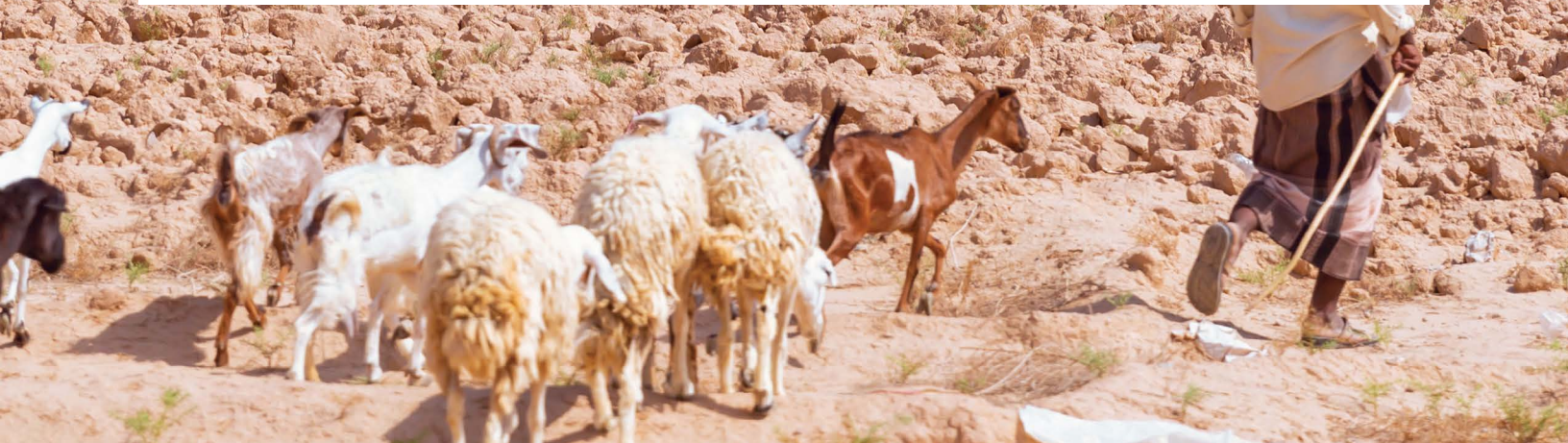
Competitor and Adversary Climate Impact Opportunities

Just as the United States is taking steps to prepare itself for a climate-affected future, Washington's global competitors—China and Russia—and its principal Middle East regional adversary—Iran—are developing their own playbooks. RAND presented plausible climate-related conflict scenarios in the CENTCOM AOR set in 2035 to subject-matter experts at a two-day workshop in February 2023 to envision China, Russia, and Iran's potential responses.

Although the workshop participants generally relied on traditional tools to respond to the climate-related security crisis scenarios, the workshop revealed that China and Russia possess climate-related toolkits if they choose to employ them. China could provide alternative energy technology to Middle Eastern countries, potentially helping navigate green transitions. Beijing is also well placed to be a first responder to climate disasters, particularly in South Asia, where China benefits from geographic proximity and strong historical ties to Pakistan.

Russia's toolkit includes developing alternatives to the Middle East's commercial shipping routes via the Northern Sea Route, newly opened by ice melt; leveraging important food exports to the Middle East; and becoming a major source of critical minerals that are necessary for the production of green energy.

Iran is acutely exposed to climate-related vulnerabilities, and climate hazards are intersecting with poor socioeconomic fundamentals (e.g., slow economic development, poor governance) to feed into civil unrest. To address its environmental policy mismanagement and to maintain internal stability, Tehran could leverage reduced water, electricity, and/or oil exports at the expense of Iraqi stability.



Steps to Take in the Face of Climate and Conflict Uncertainty

Given that the causal pathways from climate hazards to conflict revolve around political and economic concerns, reducing the incidence of climate-related conflict will require a whole-of-government approach, with CENTCOM playing a supporting role to interagency partners. However, military-led OAs provide some tools for interrupting the progression along the pathways and could decrease the severity of conflicts by improving U.S. and partner response capabilities. Figure 4 illustrates several off-ramps that could avert intrastate conflict and that CENTCOM could potentially support.

CENTCOM can address these off-ramps and conflict mitigation activities mostly through nontraditional security cooperation activities that could address climate-related security challenges. These efforts would also advance the U.S. goals of remaining the partner of choice in the region and fully integrating Israel into the CENTCOM coalition as its newest member.

Regional partners are keenly aware of the impact that climate hazards have on their countries. U.S. interagency collaboration, coupled with public-private partnerships, will be necessary to support regional innovation to address the impact of climate hazards. Table 1 provides a selection of OAs that CENTCOM, interagency partners, and regional partners could undertake in the next three to five years to address the impact of climate hazards, categorized under three categories of requirements.

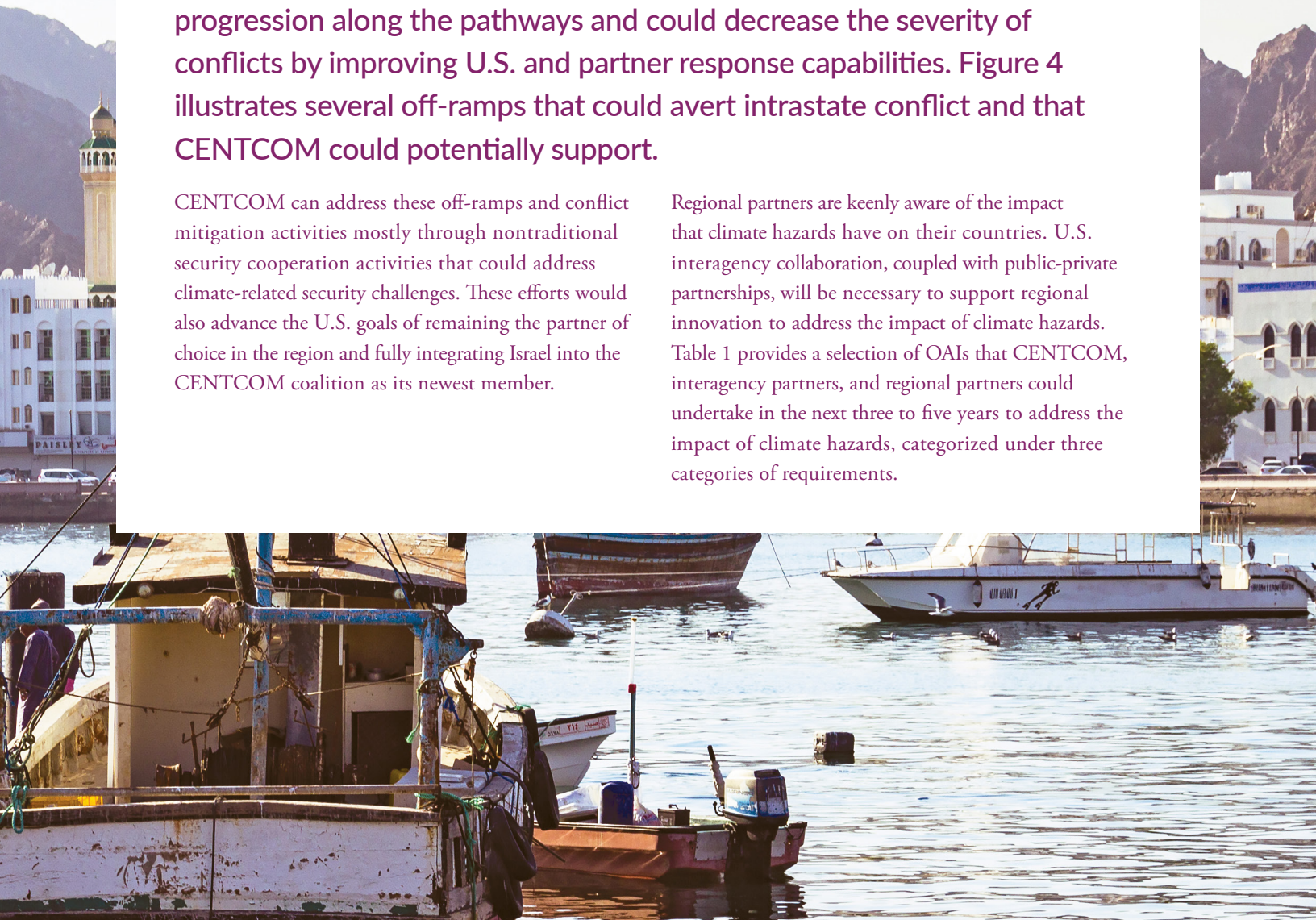
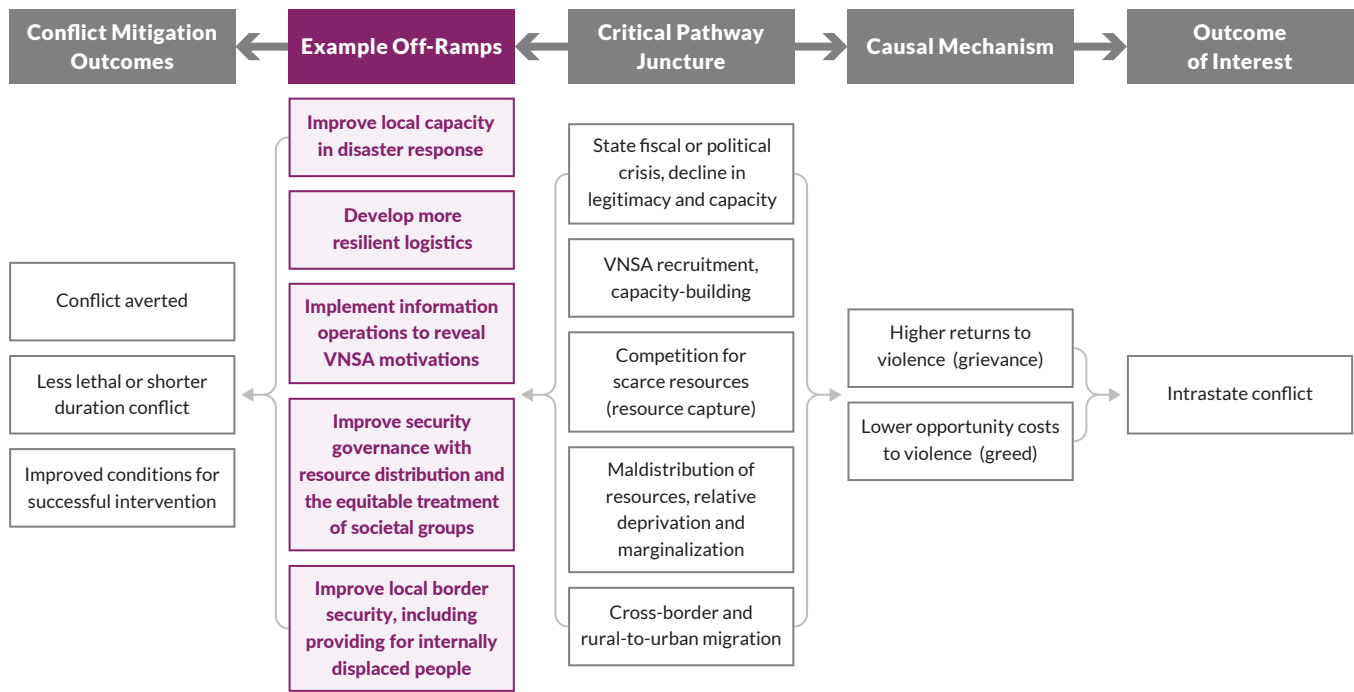


Figure 4. Intrastate Conflict Causal Pathway Off-ramps



NOTE: VNSA = violent non-state actor.

Table 1. Select Operations, Activities, and Investments for U.S. Central Command, Interagency Partners, and Regional Partners

Requirement	OAI
Incorporate climate impacts into U.S. force posture and planning in the AOR.	Incorporate climate hazards into regional exercises, including Bright Star, the Juniper series, and the International Maritime Exercise, using Joint Training Exercise and Evaluation Program funds when appropriate.
	Build climate literacy within CENTCOM and with U.S. military representatives responsible for defense relationships abroad through expanded training and education; work with Joint Professional Military Education institutions to expand offerings.
Encourage partners and allies to incorporate climate impacts into their force posture and planning in the AOR.	Establish bi- and multilateral arenas to share technology to mitigate and adapt to the impact of climate change (e.g., personal cooling equipment and all-weather intelligence, surveillance, and reconnaissance).
	Expand and provide the Department of Defense Climate Assessment Tool to regional partners to assess installation resilience to climate hazards.
	Work with partners to develop defense climate action and implementation plans.
	Identify with partners potential projects that could be funded under the Defense Operational Resilience International Cooperation program.
Prepare for an increase in HADR operations, including cooperation with regional partners and affected host nations.	Conduct bi- and multilateral regional exercises to improve disaster response and recovery missions, using Joint Training Exercise and Evaluation Program funds when appropriate.
	Expand the State Partnership Program to include National Guard partnerships with CENTCOM countries at high risk for extreme weather events (e.g., Pakistan).
	Conduct HADR-specific exercises and training with regional partners and U.S. interagency partners (e.g., USAID, FEMA).

NOTE: FEMA = Federal Emergency Management Agency; USAID = U.S. Agency for International Development.



This brief describes work done in the RAND International Security and Defense Policy Program in *A Hotter and Drier Future Ahead: An Assessment of Climate Change in U.S. Central Command*, by Michelle E. Miro, Flannery Dolan, Karen M. Sudkamp, Jeffrey Martini, Karishma V. Patel, and Carlos Calvo Hernandez, RR-A2338-1, 2023 (available at www.rand.org/t/RRA2338-1); *Pathways from Climate Change to Conflict in U.S. Central Command*, by Nathan Chandler, Jeffrey Martini, Karen M. Sudkamp, Maggie Habib, Benjamin J. Sacks, and Zohan Hasan Tariq, RR-A2338-2, 2023 (available at www.rand.org/t/RRA2338-2); *Conflict Projections in U.S. Central Command: Incorporating Climate Change*, by Mark Toukan, Stephen Watts, Emily Allendorf, Jeffrey Martini, Karen M. Sudkamp, Nathan Chandler, and Maggie Habib, RR-A2338-3, 2023 (available at www.rand.org/t/RRA2338-3); *Mischief, Malevolence, or Indifference? How Competitors and Adversaries Could Exploit Climate-Related Conflict in the U.S. Central Command Area of Responsibility*, by Howard J. Shatz, Karen M. Sudkamp, Jeffrey Martini, Mohammad Ahmadi, Derek Grossman, and Kotryna Juknevičiute, RR-A2338-4, 2023 (available at www.rand.org/t/RRA2338-4); and *Defense Planning Implications of Climate Change for U.S. Central Command*, by Karen M. Sudkamp, Elisa Yoshiara, Jeffrey Martini, Mohammad Ahmadi, Matthew Kubasak, Alexander Noyes, Alexandra Stark, Zohan Hasan Tariq, Ryan Haberman, and Erik Mueller, RR-A2338-5, 2023 (available at www.rand.org/t/RRA2338-5).

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