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CLIMATE CHANGE AND SECURITY

Headquartered in Arlington, Virginia, the CNA Corporation is a nonprofit, 501(c)(3) organization that provides in-depth, science-based research and analysis to inform the work of public-sector leaders, both nationally and internationally. Over the last 75 years, CNA has supported the U.S. federal government, the military services, state and local governments, the international community, foundations, and other nonprofits. Our staff of over 600 spans the sciences and the fields of international development, conflict stabilization, governance, public policy, security studies, and international relations. Our work on climate change, water and food security, energy, and other natural resource scarcity focuses on impacts to homeland and global security.

BREADTH OF REGIONAL SECURITY EXPERTISE

CNA's regional expertise spans Africa, the Arctic, Europe and the Eastern Mediterranean, Latin America, the Middle East, Oceania, Russia, and South Asia. CNA also houses the largest group of Mandarin-speaking China security experts outside of the U.S. government. Our experts bring substantive expertise, analytical methods, language skills, open-source methodology, data holdings, and policymaker access.

With specialties spanning insurgency and radicalization, counterterrorism, leadership analysis, organized crime, the rise of ungoverned spaces, illegal and illicit activities, governance, rule of law, and policing, our scientists and analysts bring specific security and stability capabilities to national and global policy challenges.

DEPTH OF RESEARCH EXPERIENCE AND ANALYTICS

Combining innovative approaches with time-tested methods, our research and analytic capabilities include testing and evaluation design and assessment; modeling and risk profiling; real-world reconstruction and analysis;

qualitative and quantitative data collection through surveys, focus groups, and interviews; and decision-making exercises and games.

Our researchers tackle policy problems by evaluating climate impacts, resource scarcity, security, and stability together. Examples include examining how food and water scarcity can lead to conflict in fragile states; understanding how climate impacts such as flooding can draw security forces away from primary objectives (e.g., stopping insurgents and narco-trafficking); or, more directly, evaluating how climate impacts on the countries surrounding strategic chokepoints can put our energy supply and the free flow of commerce at risk.

IMPACT OF CLIMATE SECURITY RESEARCH AND ANALYSES ON POLICY

CNA's climate security research has been referenced in every major U.S. media outlet (e.g., *The New York Times*, Fox News, *The Wall Street Journal*, *Financial Times*) and has been briefed on Capitol Hill and across the Administration. Our 2007 report, *National Security and the Threat of Climate Change*, has been the subject of direct engagement in 35 states and more than a dozen countries. Issued by CNA's Military Advisory Board, this report was the first to describe climate change as a "threat multiplier" and accelerant of instability in fragile regions.

The findings and recommendations of CNA's work on climate and energy security are echoed in the Department of Defense Quadrennial Defense Review and the National Defense Authorization Act and have influenced the energy policies of the military services.

Our regional work on climate change and water scarcity impacts in South Asia has reached senior decision makers in Bangladesh, China, India, and Pakistan. Clients turn to us to understand both the nature of a problem and how to move forward.



CLIMATE AND ENERGY SECURITY: GLOBAL AND REGIONAL PROJECTS

CNA's work on energy, climate, food, and water security examines risk, vulnerability, and impact factors that stress the security and stability of the United States and other countries around the globe. Recent assessments have examined how temperature rise will impact the costs of running U.S. defense installations and how changes in a country's energy and resource conservation policies can affect local, regional, and transboundary security dynamics. We also examine the tertiary and knock-on effects of a changing climate, such as whether large-scale reductions in fish stocks in African waters intersect with illicit and illegal activities, including piracy. Other projects have looked at climate-induced migration, the demands of refugees, and climate impacts on the role of the U.S. military in providing humanitarian and disaster response support.

Our energy security-related projects range from developing an installation energy strategy for the Navy to performing congressionally mandated studies on the feasibility of solar and wind as alternative sources of energy in expeditionary environments. For our Department of Defense (DOD) clients, we have calculated the cost and impact of efficiency at military installations, conducted research on ensuring a reliable energy supply in operational environments, and examined the competing demands for water and energy under a changing climate. Our recent work includes the following:

- **Implications of Climate Change for Colombia's National and Regional Security.** Looks at how the impacts of environmental change in Colombia's mountains, rivers, shores, and seas affect its national security, not only in the fight against narcotics production and trafficking and insurgents but also in its energy, industrial, and agricultural development, which are key to future stability.
- **Water Security Impacts in Bangladesh, China, and India.** Examines the potential political and military impacts of water scarcity and competition on stability in the Brahmaputra River region. Differences over national water management programs (including dams) and rising demand for water in agriculture, energy production, and development can disrupt the precarious security dynamics among and within these three countries.

- **Climate Change and Future Security in the Asia Pacific Region.** Explores the likely effects of climate change in the Asia Pacific for U.S. DOD missions, operations, capabilities, and security relationships. Assessing economic, demographic, and security trends in the region, as well as U.S. defense policies, we explore the likely future for cooperation in humanitarian assistance and disaster response, the building of local resilience and adaptation, and Arctic requirements and operations.
- **Opportunities for Energy Conservation at Department of the Navy Installations.** Assesses specific energy conservation initiatives and linkages to water consumption savings and cost reductions.
- **The Economic Implications of Disruptions to Maritime Oil Chokepoints.** Evaluates how potential disruptions at critical chokepoints affect the U.S. economy and economies around the world.
- **An Ounce of Prevention: Preparing for the Impact of a Changing Climate on U.S. Humanitarian and Disaster Response.** Examines the changing roles of DOD and the response community under cascading climate impacts.
- **Climate Migration and Security.** Evaluates how climate-induced migration in the "near perimeter" will drive the need for new federal policy on coordination with regional allies, adaptation, and U.S. strategy.

CHANGES IN THE ARCTIC AND IMPACTS ON SECURITY

Receding and thinning sea ice in the Arctic is opening the region to greater human access and exploitation. Risks abound, however, in environmental uncertainties and harsh conditions, and various maritime boundaries and security issues are unsettled. Keeping the Arctic safe and secure and developing its resources safely and responsibly demand interagency and international collaboration across a range of issues.

For Canada, Denmark, Norway, Russia, the United States, and other nations, climate change effects will create new infrastructure challenges on land and at sea and bring new monitoring and rapid-response requirements. These nations are cooperating to define protocols and processes for coordinated action



and practicing joint regional search and rescue, oil spill response, and coordinated command and control. Still, divergent national interests and priorities, including those of extraregional states that desire access and influence in the Arctic, complicate confidence building and agreement on rules and standards.

CNA's recent work on climate, international security, and partner relations in the Arctic includes the following:

- **Identification and Assessment of Arctic Infrastructure.** As ice cover recedes in the Arctic and areas of access widen, DOD and Department of Homeland Security missions and operations are changing. CNA is assessing existing and planned Arctic shore and aerial infrastructure and identifying future gaps to support DOD requirements and operations in the region.
- **Strengthening the Navy's Arctic Capabilities through Partnership.** Broadening human access and activity in the Arctic increases the requirements for U.S. Navy capabilities in the Arctic to support maritime safety and risk management. This study explores how the Navy can improve its own capabilities and promote regional cooperation for maritime safety and security by improving data-sharing relationships with interagency and international partners in three areas: hydrography and nautical charting, weather and ice forecasting, and maritime domain awareness.

THE CNA MILITARY ADVISORY BOARD

Since 2006 the CNA Military Advisory Board, an advisory group that has included more than two dozen retired admirals and generals from the Army, Navy, Air Force, and Marine Corps, has collaborated with CNA research staff on projects examining the linkages between national security and resource scarcity (e.g., changes in energy, water, food, and the environment). The admirals and generals of the CNA MAB bring their vast operational, tactical, and strategic experience and perspective to domestic and international security challenges. The CNA MAB has been instrumental in creating a domestic and international dialogue on climate change, energy security, and the need for transformational change in how we supply and use high-carbon energy. This group has highlighted how climate impacts will affect stability in fragile regions around the world and influence homeland security challenges in the United States. The ongoing work of the CNA MAB has added an important

new voice—that of senior military leadership—calling for the United States and other countries to recognize the national security implications of climate change and the imperative to both adapt to climate impacts and move toward a low-carbon global economy.

No other private body has had as much influence on U.S. energy and national security policy as the CNA MAB. The follow-on work and outreach conducted by the MAB has educated and engaged critical audiences in Washington, D.C., and around the United States.

USING GAMING AND EXERCISES TO INFORM CLIMATE AND ENERGY POLICY

CNA is an internationally recognized center for excellence in gaming and game design. For 20 years, CNA has conducted large-scale, high-quality games and scenario-based exercises for foundations, federal and state government clients, and the international community in locations ranging from the White House to the Orange Dome at Syracuse University to Delhi, India. Our diverse clients include the Italian Ministry of the Interior, the Skoll Global Threats Fund, the Rockefeller Foundation, DOD, and the U.S. Navy.

CNA focuses on understanding the client's objectives and choosing the right tool to achieve them. We deliver a gaming experience that is real and engaging and that challenges the players' knowledge and understanding of their processes.

- **Bone Dry and Flooding Soon: A Regional Water Management Game** brought together senior leadership from Bangladesh, China, India, and Pakistan to examine the impact on security from climate-induced changes in the flows of the Brahmaputra.
- **Global Food Security.** CNA developed and analyzed the outcomes of a policy decision-making game to explore issues arising from, and possible responses to, global food system disturbances. The game brought together senior officials and experts from Africa, Brazil, China, the European Union, India, the United States, multilateral institutions, and the private sector. The game's dynamic design allowed players the opportunity to make decisions in response to global food system disruptions and experience how their actions influenced global food security.

CLIMATE IMPACTS AND U.S. HOMELAND SECURITY

DOMESTIC IMPACTS AND EMERGENCY

PREPAREDNESS As climate impacts begin to affect the patterns of natural hazards such as tropical cyclones, wildfires, floods, and winter storms, the historical data that typically inform the hazard identification and risk assessment process may not accurately forecast events or the impacts, services, and resources required for response and recovery.

Emergency preparedness planners will need to take these changes into consideration when using historical data to model the probability of hazards and their potential impacts, thereby affecting how government officials and the private sector approach their disaster mitigation and overall preparedness strategy.

Under a grant from the Rockefeller Foundation, CNA released *Why the Emergency Management Community Should Be Concerned about Climate Change*. In this report, we examine the impact of climate change on comprehensive emergency management and preparedness policy and outline the key climate change issues for consideration from an emergency management perspective.

Forecasts and predictive analyses of the consequences of climate change will allow regions to incorporate emerging challenges to emergency management into planning cycles and to build response capabilities accordingly. The emergency management community can then use the already established risk analysis process to identify disaster mitigation and preparedness efforts to arm their respective localities against these shifting hazards. For example, by incorporating better forecasts and understanding of risk, managers can adjust community preparedness campaigns and enhance the existing support structures for their most vulnerable populations, including those who will be disproportionately affected by a changing climate.

CLIMATE CHANGE EXERCISES In 2014 CNA supported a White House–sponsored climate change adaptation and resilience exercise series across the United States, in which participants from local, state, and federal agen-

cies, as well as academic, nonprofit, and private sectors, examined local climate impacts within the context of whole community capabilities and responsibilities.

This exercise series identified problems with the types of preparedness activities that jurisdictions undertake, the execution of response operations, and the implementation of long-term recovery strategies. This work has provided a baseline for the emergency management community of what we know—and don't know—about effective and feasible adaptation planning for our nation's communities and critical infrastructure.

ENERGY-WATER-CLIMATE NEXUS

Global trends such as population growth, migration, rising affluence in emerging economies, shifting demographics, and a changing climate will individually—and collectively—place more and more stress on our global water, food, and energy resources. CNA is examining the water-food-energy-climate nexus from both a domestic preparedness and a global security perspective. We study the potential impacts of regional water stress on conflict in the Middle East and North Africa, analyze water stress risk on military installations both at home and abroad, and evaluate how natural resource scarcity manifests in transnational threats such as the rise of extremist groups and hybrid conflict.

We have also looked closely at the ties that connect energy generation, water use, and climate mitigation and adaptation. Some of the least expensive options for power generation, such as natural gas, require only half the water that coal uses for thermal cooling, and wind and solar photovoltaic (PV) require none. Natural gas generation also has the benefit of releasing half the carbon dioxide of coal; wind, PV, and energy conservation also avoid emissions. To explore these potential synergies, CNA has developed a power sector model that accounts for water used in generation and has applied it to studies in China, France, India, and Texas.

ABOUT CNA

CNA is a nonprofit research and analysis organization with 75 years of experience providing government agencies with data-driven insights and real-world, actionable solutions grounded in our direct experience with the operational environments where these solutions are applied. CNA developed the foundational techniques for operational analysis to address complex challenges facing government programs. We have applied these techniques successfully in areas ranging from defense to aviation, education, justice, and homeland security.

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