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Report on New Security Challenges

DEPARTMENT OF STATE

International Security Advisory Board

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United States Departement of State
Washington DC 20520

March 13, 2023

MEMORANDUM FOR UNDER SECRETARY BONNIE D. JENKINS

SUBJECT: Final Report of the International Security Advisory Board (ISAB) on New Security Challenges

This report responds to your request of October 18, 2022, that the Board undertake a study on "how transnational challenges such as resource scarcity and climate change affect the traditional international security work that falls within the mandate of the T Bureaus." The report was drafted by members of a study group chaired by Ms. Sherri Goodman. It was reviewed by all ISAB members and unanimously approved by all the ISAB members present at the ISAB plenary meeting on March 12, 2024.

This study group focused on three issues that are of particularly great concern: (1) climate change and resource scarcity – especially of energy, food, water, and marine life; (2) emergence and spread of human, animal, and plant diseases; and (3) the exploitation of identity-based bias, discrimination, and violence by state and non-state actors. Attention to these areas, to which we refer as "new security challenges," will pay rapid dividends for T bureau investment and bring these bureaus in line with thinking in other agencies, key partners, and civil society. This report includes a series of specific findings and recommendations for the Department of State.

My ISAB colleagues and I stand ready to discuss our report with you.

Honorable Edwin Dorn
Chair
International Security Advisory Board

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I. New Security Challenges – Definition, Findings, and Recommendations

"What means security to one nation, may not mean security to another. Where one person feels secure another may face poverty, lack of education, opportunity, health care, and access to equal rights no matter their gender. For some, security means a stable and prosperous economy, for others their very right to exist is at stake either because of their very identity, or the climate impact on their borders."

> -- Remarks by Ambassador Bonnie Denise Jenkins, Under Secretary for Arms Control and International Security, Henry L. Stimson Center, Washington, DC, October 5, 2023

In October 2022, the Under Secretary of State for Arms Control and International Security (T) directed the International Security Advisory Board (ISAB) to undertake a study on how new and emerging security threats not currently included under the mandate of the T bureaus[a] are nonetheless affecting their work, and to recommend actions relevant bureaus can take to respond to these non-traditional security threats and further U.S. interests.

The field of issues currently understood to have security dimensions is very wide. This study group opted to focus on three that are of particularly great concern, whose security implications are now well-studied outside government and have received at least initial consideration from other parts of government. Attention to these areas, to which we refer as "new security challenges," will pay rapid dividends for T bureau investment and bring these bureaus in line with thinking in other agencies, key partners, and civil society. They are: (1) climate change and resource scarcity – especially of energy, food, water, and marine life; (2) emergence and spread of human, animal, and plant diseases; and (3) the exploitation of identity-based bias, discrimination, and violence by state and non-state actors.

[a] The three T bureaus are: the Bureau of Arms Control, Deterrence, and Stability (ADS); the Bureau of International Security and Nonproliferation (ISN); and the Bureau of Political-Military Affairs (PM).

These challenges are exacerbated by dependence on a global information infrastructure that is vulnerable to attack and can be exploited to propagate disinformation.

These challenges are no longer "new" to civil society, academia, and the private sector – or to many U.S. allies and adversaries. A range of U.S. government and international strategy documents highlights them, including: the National Security Strategy (NSS) and National Defense Strategy (NDS) (from the Biden and prior administrations); multiple National Intelligence Estimates (NIEs); the Global Fragility Act (GFA) passed by Congress and signed by President Trump in 2019; and the United Nations Sustainable Development Goals (SDGs). While agencies have been directed to increase focus on these risks, the T bureaus lack a clear strategy for doing so.

Findings:

1. New security challenges are transforming the landscape for international security and diplomacy. Tensions over new security challenges, such as climate impacts, environmental degradation, and competition for resources, are increasingly important items on the security agenda and in multilateral fora. The new security challenges framework encompasses and integrates areas Secretary Blinken has identified as mission-critical.[1] Global strategic competition in particular should be viewed through the lens of new security challenges, as vulnerable countries, including many U.S. allies and partners, seek assistance for climate adaptation and resilience.
2. Fragile states particularly lack governance capacities and resources to enhance resilience in the face of new security challenges. The combined impacts of climate insecurities and resource scarcity in fragile states exacerbate poverty and social instability; drive population displacement; and unveil governance gaps and grievances that can be exploited by state and non-state actors. Violent extremist organizations are weaponizing water, food and shelter, and health services by leveraging resource scarcity among vulnerable populations, with a disproportionately negative impact on women, girls, and gender nonconforming or non-binary persons.
3. Food insecurity exacerbated by climate change spurs multiple security challenges. It erodes the health of vulnerable populations, undermines economic productivity, and

can incentivize adoption of extractive industries and intensified agricultural, livestock, forestry, and fisheries activities (legal or illicit) that damage the natural resource base. Human encroachment into previously unsettled territories exacerbates the risk of exposure to new pathogens and the spread of infectious diseases. Outbreaks can be exploited through the spread of disinformation and misinformation intended to reduce public trust in governments and technical authorities. Biotechnology solutions that have the potential to mitigate impacts of climate change and resource scarcity on food security and ecosystem services can also present complex biosafety, biosecurity, financing, and sustainability challenges.

4. The Administration in general and the Department of State specifically have prioritized equality and equity efforts in policy and personnel. This understanding of the relationship between identity and policy needs also to be reflected in our international security efforts. The U.S. government's attention to identity issues, including gender, is still in development, and what analysis exists is fragmented. The failure to take a more systemic approach, instead fixating on particular identities, can lead to gaps and misallocation of scarce resources. The Under Secretary of State for Arms Control and International Security's leadership in tapping diverse delegations and highlighting identity concerns in various international security fora has prompted positive international reaction and demonstrates the value of the T bureaus accounting for how identity affects security.

5. Net zero goals for climate change will require diversified sources of energy, including nuclear energy. U.S. leadership on advanced nuclear technologies will be increasingly important to achieving global climate goals. As Under Secretary Jenkins has stated: "The world needs clean, reliable, safe, and secure energy options to address the realities of climate change and move toward our shared net-zero 2050 goals, while meeting increasing energy requirements. Civil nuclear energy is an important part of that mix. Advanced nuclear technologies such as small modular reactors can help make this transition to a green economy with greater diversification and reliability in energy sources."

6. The T family of bureaus' traditional arms control tools are relevant to new security challenges, particularly to managing the controversy, risk and opportunity presented by a class of technologies known as solar geoengineering, designed to reduce the worst impacts of climate change.
7. The T bureaus are engaged in a range of activities that advance the UN's Sustainable Development Goals, with the most efforts clustered under Goal 3 (Good Health and Wellbeing), Goal 5 (Gender Equality), and Goal 16 (Peace, Justice, and Strong Institutions). These are areas where the T bureaus are well-positioned to deepen impact and partnerships to respond to new security challenges in the future.
8. Misinformation and disinformation exacerbate every one of the new security challenges highlighted in this report. Their use in conflict is not new, but the speed, pervasiveness, and low-cost nature of the technologies used to produce and share such messages make disinformation and misinformation incredibly difficult to combat.

Recommendations:

1. Establish a Senior Advisor for New Security Challenges to the Under Secretary for Arms Control and International Security.
    a. The advisor should coordinate and implement a strategy, identify resources, and propose organizational changes necessary to integrate new security challenges across the T bureaus.
    b. The advisor and supporting staff should work closely with the Office of the Special Presidential Envoy for Climate (SPEC), the Bureau of Oceans and International Environmental and Scientific Affairs (OES), the Office of Global Change in OES, the Bureau of Conflict and Stabilization Operations (CSO), the Bureau of Global Health Security and Diplomacy (GHSD), the Secretary's Office on Global Women's Issues (S/GWI) and other bureaus across the Department.
    c. The advisor should have a working knowledge of bilateral and multilateral arms control treaties and agreements.

   d. The advisor should identify technical and analytical resources from organizations within or affiliated with the USG that can be made available to support the advisor and the T bureaus.

   e. The advisor should work with the Bureau of Political-Military Affairs (PM) to finalize and fund PM's Interim Climate Security Guidance.

2. Better integrate analytical tools and new technologies with recruitment, education, and training. T bureaus also needs more attention to funding authorities to address new security challenges. Core Department of State documents, such as the Foreign Affairs Manual (FAM) should incorporate them. T family security objectives would benefit as well from tailored regional strategies for climate, peace, and resilience.[2]

3. Leverage the new security challenges framework to strengthen existing international partnerships and build new ones. Such new geometries of bilateral and multilateral engagement can positively influence key strategic relationships in all regions, in particular countries identified by the Global Fragility Act (GFA) and other regions of growing strategic importance, including East Asia and Oceania, Coastal West Africa, and the Sahel.

   a. The Department of State should develop tailored regional climate security strategies in coordination with other departments and provide funding and human resources for implementation.

   b. One such opportunity for closer cooperation with key partners including Canada, Mexico, and many of our treaty allies is presented by the Feminist Foreign Policy Plus group at the UN. T bureaus should explore opportunities to engage with these security partners in developing and championing shared language and objectives in multilateral settings.

   c. The Department of State should build on existing capacity-building programs and partnerships to promote strategic cooperation for responsible research, development, and use of technologies in countries that are highly vulnerable to impacts of climate change and resource scarcity.

   d. Develop a department-wide strategy on climate, peace, and resilience to address early warning, climate resilience, and sustainable development including health, water, and food security. Such a strategy would ensure that conflict risk factors are taken into account in the context of climate adaptation policy, planning and programming, and that, conversely, climate adaptation needs are prioritized in areas that are more susceptible to potential climate-induced violence or conflict.

4. Establish a standing coordinating body to enhance collaboration among the T bureaus and with the recently created Bureau of Global Health Security and Diplomacy and other programs in the Department of State responsible for addressing the breadth of the biothreat landscape. This coordinating body would need to integrate expertise in climate impacts and resource scarcity. It would focus on areas such as capacity-building interventions related to early warning and management of disruptive biological events and infectious disease outbreaks. It would also address export controls related to biotechnologies with potential to mitigate health and food security challenges.

5. Establish adequate technical expertise within T bureau programs and through coordination with other Department of State experts to engage the international community for safe development and use of biotechnology innovations to reduce global climate risks (in alignment with Executive Order 14081).

6. Integrate concerns about the exploitation of identity-based bias, discrimination, and violence by state and non-state actors into analysis and decision-making around security assistance. This should include developing a rubric for demonstrating effectiveness in addressing root causes of instability; assessing security assistance for its long-term costs and benefits on women and historically marginalized communities; and requiring transparent reporting and accountability measures. The Department as a whole should learn from and institutionalize T family's current efforts to leverage a focus on representation and equality for better diplomatic outcomes. The Under Secretary for Arms Control and International Security should ensure that security assistance and cooperation is assessed for impact on new security challenges. The Department of State should:

a. As part of the security budget and appropriations process, develop a 360-degree review – including outreach to independent experts, civil society and affected groups on the ground – to ensure resourcing reflects real-time needs. Where it is not possible to adjust established appropriations, the Department of State should publish a public statement describing the T bureaus' more fit-for-purpose recommendations for resourcing levels.

b. Recognizing the T bureaus' work to integrate both gender equality and climate change into their activities thus far, the bureaus should be more engaged in ongoing efforts at State to address the interconnected facets of these issues. This includes acknowledging the disproportionate impact of climate change on women, girls, and gender nonconforming or non-binary persons[3] and engaging with them as well as other historically-marginalized persons.

7. Broaden the scope of T bureaus' analysis and consumption of intelligence to systematically integrate new security variables.

    a. Given the challenges and opportunities posed by geoengineering, existing monitoring capabilities such as Sandia National Laboratories' Cooperative Monitoring Center, among others, could be utilized to monitor and assess emerging new security challenges, including the use of solar radiation or other geoengineering techniques by countries or organizations.

    b. Predictive models used by the T bureaus should consider environmental, social, and political power dynamics; they should also be carefully reviewed to ensure that they do not replicate social biases or outdated assumptions.

    c. Pursuant to academic research demonstrating direct links between the treatment of women and minoritized groups with democratic backsliding and the rise of authoritarianism,[4] embassies and partner agencies should monitor state policies and the legal, social, and economic status of women and other marginalized groups as an indicator of overall social cohesion and regime vulnerabilities and include these as criteria in their early warning system analysis.

8. Deepen and expand the work of the Foundational Infrastructure for the Responsible Use of Small Modular Reactor Technology (FIRST) and Winning an Edge through Cooperation in Advanced Nuclear (WECAN) programs to make an even greater contribution towards achieving Net Zero Emissions goals. U.S. law requires a legally binding agreement for peaceful nuclear cooperation that involves U.S. transfers of nuclear power reactors, major reactor components, or nuclear material to a partner country. The process for reaching these agreements, known as 123 Agreements, should be as streamlined as possible, consistent with U.S. law and the highest standards of nuclear security, safety, and nonproliferation. Requiring the so-called "gold standard" in a 123 Agreement, i.e., a legally binding obligation requiring the partner country to forgo all enrichment and reprocessing, may deter a prospective partner from buying nuclear reactors and material from the United States. Washington should nonetheless endeavor, where necessary, to obtain commitments in some form — not necessarily binding legal obligations in a 123 Agreement – from potential partners to forswear all enrichment and reprocessing of nuclear material. Given the efforts to replace Russian enrichment capacity in the global market and meet expected growing demand for nuclear reactor fuel, the United States should develop a policy to guide future enrichment capacity development for partners who are non-nuclear states parties to and in compliance with the Treaty on Nuclear Non-Proliferation (NPT) and with their International Atomic Energy Agency (IAEA) comprehensive safeguards agreements including the Additional Protocol. Such policy should address, on the one hand, how to ensure that assistance provided to such states in developing enrichment capacity does not contribute to their ability to develop nuclear weapons; and on the other hand, how to address losses in the U.S. nuclear export market to sellers who do not require strict commitments for no enrichment and reprocessing.

9. Explore with the interagency whether an international or regional dialogue on geoengineering governance, including solar radiation management (SRM) research and development, is appropriate. The Department of State may be able to utilize existing monitoring tools, such as those mentioned above, to better understand, for example, possible unplanned uses of SRM and to foster dialogue with other countries engaging in

SRM research or planning. The Department, in coordination with other agencies, and utilizing the capabilities of the T bureaus, may be able to foster dialogue on responsible research and global standards and norms that should govern geoengineering research.

10. Improve understanding within and outside government of how nonproliferation, arms control, and regional security efforts contribute to achieving the Sustainable Development Goals (SDGs) – and vice versa. Currently, the T bureaus have only begun to message the SDGs as interconnected with arms control, and can do more to both increase interest publicly and widen outreach to non-traditional partners.

    a. The T bureaus should enhance their communications across the Department of State, the interagency, and with the public to promote understanding of their essential role in promoting safe and secure use of biological, chemical, and radiological/nuclear materials and emerging technologies to enable global scientific collaboration, empower innovation, and promote health and well-being.

    b. The T bureaus should engage with policy and programs across the Department of State in bureaus such as OES; SPEC; the Bureau of Democracy, Human Rights, and Labor; the Secretary's Office of Global Women's Issues; the Bureau of Energy Resources; the Bureau of Economic and Business Affairs; and the Bureau of Educational and Cultural Affairs (this list is not exhaustive) on the linkages with T equities. Each of these bureaus has well established lines of communication and partnerships with various international organizations, civil society, and official government channels that can be utilized to approach existing and emerging challenges in new and innovative ways.

    c. The Department of State should strengthen partnerships with the National Laboratories and identify opportunities that develop a broader range of expertise both inside and outside of the USG.

    d. The T bureaus should utilize embassy public diplomacy channels, as well as social media, to educate about the connections between the Sustainable Development Goals and T equities.

II. Introduction

In October 2022, the Under Secretary of State for Arms Control and International Security (T) directed the International Security Advisory Board (ISAB) to undertake a study on how new and emerging security threats not currently included under the mandate of the T bureaus are nonetheless affecting their work, and to recommend actions relevant bureaus can take to respond to these non-traditional security threats and further U.S. interests.

This study defines new security challenges to include climate change and resource scarcity – especially of energy, food, water and marine life; spread of infectious diseases; acute, protracted and complex disasters driving displacement, migration and refugee movement; and the exploitation of identity-based bias, discrimination, and violence by state and non-state actors. These challenges may be exacerbated by dependence on a global information infrastructure that is vulnerable to attack and can be exploited to propagate disinformation.

Our understanding of what contributes to, or undermines, peace and security has shifted dramatically over the 25 years since the T bureaus were created in their current form out of the merger of the Department of State's prior Bureau of Political-Military Affairs with the Arms Control and Disarmament Agency.

The old understanding, that peace equals the absence of military conflict and is promoted by ensuring that legitimate government entities enjoy a monopoly on the use of force, is still reflected in T's structures, culture, and the preponderance of its activities – as well as in the persistence of the arms control paradigm that lies at the center of its work.

When the T bureaus were created, nuclear war was the chief existential threat facing the United States and the world and peace was understood to equal the absence of war. The Under Secretary for Arms Control and International Security was established around three core assumptions that have come under increasing challenge:

- That peace and security flow above all from the military/security policies of states;

- That legally binding arms control agreements are our best option to regulate the proliferation of weapons and dual-use technologies among states;

- And that, following the Cold War, our institutions would enable the world to move toward increasing economic integration and peace associated with the rules-based international order.

The world we face today has shifted dramatically since then, as has our understanding of what constitutes both security and threats. The above constructions neither acknowledged existing threats outside this paradigm, such as the use of identity-based bias, discrimination, and violence by state and non-state actors, nor fully anticipated new ones, like climate change. Because the design of our current institutions flows from this ethos, they are not equipped to understand and respond to the defining security challenges of today. The Department of State, and the T family in particular, must update or adjust their structures as well as the 20th century thinking that gave rise to them.

Traditional security issues have not disappeared, of course. We find ourselves closer to the brink of nuclear conflict than we have been in decades. In the absence of swift military victory in Ukraine, a range of Russian officials and commentators, not just President Vladimir Putin, have issued implicit and explicit nuclear threats. Meanwhile, the Russian government has pursued a number of brutal and destabilizing tactics, including the use of rape as a weapon of war, the abduction and forced nationalization of children on a massive scale, and the sowing of disinformation to undermine biological weapons nonproliferation norms and erode trust in public health interventions. At the same time, Russia's most important partner and neighbor, the People's Republic of China (PRC), also led by an autocratic strongman, is assembling a nuclear arsenal with a speed that defied earlier predictions, and is engaged in military threats against Taiwan. Hamas' brutal terrorist attack against Israel on October 7, 2023, and Israel's military response in Gaza led to a new war in the Middle East and provides a stark example of how previous assessments of the absence of active conflict did not mean the presence of peace and human security.

These traditional military threats are occurring alongside the set of evolving security challenges. Of these, climate change is the most significant and existential threat that has emerged, but it is not the only challenge, as noted at the outset of this report.

While these issues are no longer "new or emerging," because they fall outside traditional areas of security they have remained largely unaccounted for within the mandate of the T bureaus, and often the Department of State as a whole. While the T bureaus are not, as they are currently structured, well-equipped to respond to these threats, our national security policy is beginning to account for them, including more than half a dozen strategy documents and executive actions issued by the Administration, in many cases building on similar statements made by its predecessors:

- The January 27, 2021, Executive Order on Tackling the Climate Crisis at Home and Abroad, which states that, "*Climate considerations shall be an essential element of United States foreign policy and national security.*"

- The October 2022 National Security Strategy, which states that, *"Of all of the shared problems we face, climate change is the greatest and potentially [most] existential for all nations. Without immediate global action during this crucial decade, global temperatures will cross the critical warming threshold of 1.5 degrees Celsius after which scientists have warned some of the most catastrophic climate impacts will be irreversible,"* and "*We are also implementing this development approach to advance global health security and systems and to take principled humanitarian action while addressing the root causes of fragility, conflict, and crisis, including through the Global Fragility Act. We will use our humanitarian, development, and peacebuilding tools more cohesively. And we will invest in women and girls, be responsive to the voices and focus on the needs of the most marginalized, including the LGBTQI+ community; and advance inclusive development broadly."*

- The October 2022 National Biodefense Strategy and Implementation Plan for Countering Biological Threats, Enhancing Pandemic Preparedness, and Achieving Global Health Security, which states that, "*Advances in life sciences and biotechnology promise better and faster cures, economic advances, a cleaner environment, and improved*

quality of life, but they also bring new security risks that must be managed. In this rapidly changing landscape, the United States must be prepared to manage the risks posed by natural outbreaks of disease, accidents with high-consequence pathogens, or adversaries who wish to do harm with biological agents."

- The March 8, 2021, Executive Order on Establishment of the White House Gender Policy Council, which states that, "*Advancing gender equity and equality is a matter of human rights, justice, and fairness. It is also a strategic imperative that reduces poverty and promotes economic growth, increases access to education, improves health outcomes, advances political stability, and fosters democracy. The full participation of all people — including women and girls — across all aspects of our society is essential to the economic well-being, health, and security of our Nation and of the world*."

- The January 20, 2021, Executive Order on Advancing Racial Equity and Support for Underserved Communities Through the Federal Government, which states that, "*[i]t is therefore the policy of my Administration that the Federal Government should pursue a comprehensive approach to advancing equity for all, including people of color and others who have been historically underserved, marginalized, and adversely affected by persistent poverty and inequality. Affirmatively advancing equity, civil rights, racial justice, and equal opportunity is the responsibility of the whole of our Government.*"

- White House Report of the Impact of Climate Change on Migration, October 2021, which states that, *"As the effects of climate change intensify, it is important to understand the underlying factors that may mitigate or exacerbate migration, and develop strategies to both proactively and humanely manage these impacts and be considered in the context of any geographic or environmental factors that would contribute disproportionately to the destabilization of economically or politically important regions*."

The Department of State, including but not limited to the T bureaus, needs to update its institutions in line with this more comprehensive and intersectional approach.

This approach has precedents among the closest U.S. allies. One example of such an approach comes from Germany's new National Security Strategy, which offers the concept of "integrated security," advancing priorities across global health, gender equality and social cohesion, climate justice and multilateralism.[5]

This ISAB study seeks to address how the new security threats we have identified can be further integrated across the T bureaus by:

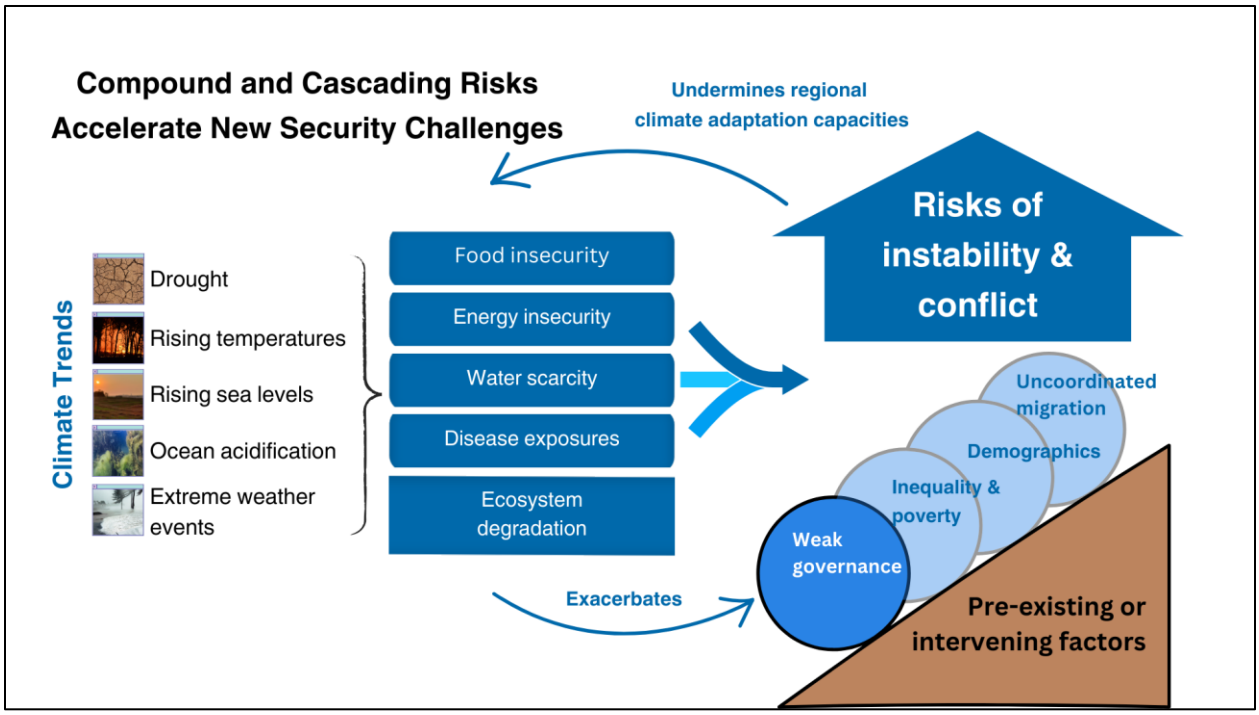
- Examining these threats and risks in the context of the T bureaus' missions for international security and arms control;
- Assessing the T bureaus' current posture and programming on these challenges;
- Identifying gaps in programming and/or funding;
- Suggesting opportunities the T bureaus have to reduce the risks of climate disruptions through their existing programs;
- Helping the T bureaus better align existing security assistance and other programs to reduce climate risks, advance clean energy, and promote sustainable solutions;
- Exploring the capabilities the T bureaus need to fulfill the Secretary's priority to develop solutions for these shared global challenges;
- Recommending actions that the Department of State and the T bureaus can take to advance the objectives of reducing risks associated with these new security challenges to international security, advancing the clean energy transition, and promoting sustainable and inclusive solutions;
- Outlining opportunities for the Department of State and the T bureaus to leverage the new security challenges framework in order to engage in what the Secretary of State calls variable geometry of diplomatic engagement with non-traditional actors.[6]

III. How New Security Challenges Affect the Current International Security Posture

Emerging threats layered on top of traditional threats have made the international security landscape more dynamic and complicated. If we thought that the expansion of democracy was inevitable, that arms control provided an obvious solution to the dangers posed by weapons of mass destruction, that a major land war in Europe or the reignition of conflict between Israel and Hamas was unlikely, and that the PRC's rise would not threaten the existing international order, we were wrong.

Meanwhile, climate change poses a greater and greater national security threat; resource scarcity—especially of energy, food, water and marine life—is exploited by non-democratic political regimes; human behaviors and environmental encroachment create new risks for the emergence and spread of infectious diseases and antimicrobial resistance; acute and complex disasters will drive displacement, migration, and refugee movement; and identity-based bias, discrimination, and violence continues to threaten U.S. interests.

The COVID-19 pandemic precipitated a global economic crisis that exacerbated inequality within and among countries. Environmental degradation and loss of biodiversity amplify risks of future pathogen spillover from animal and environmental sources into humans with local and regional impact on lives and livelihoods. These non-traditional security threats are fundamentally reshaping security around the world and have direct implications for foreign policy and diplomacy.



New Security Challenge I: Climate Change and Resource Scarcity

The Department of State has elevated climate change as a priority, but in many respects, it is not yet prepared for the ways in which climate and resource scarcity are fundamentally reshaping 21st century diplomacy, arms control, and nonproliferation. Meanwhile, the United States is overly reliant on Russia for uranium for nuclear reactor fuel, and overly reliant on the PRC for key rare earth minerals.[7] While some laudable efforts are underway to advance clean energy technologies, what is missing is a systematic assessment of how emerging security challenges are changing the balance of capabilities that the Department of State needs for 21st century diplomacy.

The 2022 National Security Strategy elevates climate change to one of the most important threats facing both the United States and the world. It states, "*Of all of the shared problems we face, climate change is the greatest and potentially existential for all nations. Without immediate global action during this crucial decade, global temperatures will cross the critical*

warming threshold of 1.5 degrees Celsius after which scientists have warned some of the most catastrophic climate impacts will be irreversible."[8]

The 2021 National Intelligence Estimate on Climate Change assesses that "climate change will increasingly exacerbate risks to U.S. national security interests as the physical impacts increase and geopolitical tensions mount about how to respond to these challenges. Global temperatures have increased more than 1.1 C since pre-industrial times and most likely will add 0.4 C to reach 1.5 around (or before) 2030."[9]

As temperatures continue to rise, despite efforts to mitigate carbon emissions and decarbonize energy production, both human and planetary systems are destabilized by increasing unpredictability. No longer can planners rely on past weather and climate forecasts to predict future rainfall, agriculture productivity, or water availability.

The very concept of security is premised on a reasonable level of predictability for the natural systems on which governments, at every level, base planning for the safety of their citizens. Governments are increasingly unable to protect their citizens from either the devastating effects of climate-fueled extreme weather events or the long-term devastation of prolonged drought and food scarcity.

From the tragic floods in Pakistan in 2022 to the prolonged drought across parts of Africa and Latin America, strategic regions are increasingly destabilized by compound climate effects colliding with other factors such as state fragility, weak governance, conflict over identity and inequality, and poor infrastructure and social resilience. These nontraditional security threats are fundamentally reshaping security around the world and have direct implications for foreign policy and diplomacy.

In some regions, the effects of climate change may pose existential threats in coming decades. Parts of Africa and Latin America are particularly vulnerable in this regard, as are certain Pacific Islands which may lose their land entirely. Because these unpredictable climate events can trigger and exacerbate existing regional security challenges, we refer to them as "climate disruptors."

Climate disruptors could take the form of significant destabilizing effects on the energy transition, from global supply chain shortages of key critical materials to power decarbonized energy systems, including batteries, to over-reliance by the United States on adversaries for these materials. They may be climate threat multipliers, such as heat, sea level rise, extreme weather events, fire, flood, drought, and permafrost thaw, that destabilize regions of strategic importance to the United States. Secondary climate effects can also be disruptors, such as climate-driven migration, internal conflict, child recruitment for terrorist activity, famine and food insecurity, emergence and redistribution of infectious diseases and water shortages.

While the Department of State has elevated climate change in many respects, it is not yet prepared or organized for ways in which climate disruptions are exacerbating resource scarcity, driving competition, and fundamentally reshaping 21st century diplomacy. The PRC is a near peer competitor that has an economic footprint and growing political influence in Africa and Latin America. Russia under Putin has waged an unprovoked war on Ukraine and supports the Wagner mercenaries arming climate vulnerable countries in Africa. Climate disruptions will further destabilize countries and test governing capacities.

New Security Challenge II: Spread of Infectious Diseases

In the wake of the devastating Ebola virus disease outbreak in West Africa (2014-16) and the COVID-19 pandemic that spread from China in early 2020, it would seem self-evident that biological events can threaten not only lives and livelihoods but local, national, and regional economic and political stability.

Climate disruptions are likely to affect the frequency and severity of biological events, as changing rainfall patterns and temperatures shift the ranges of insects capable of transmitting diseases such as malaria and dengue fever, and lead to the growth and persistence of water- and foodborne pathogens with the potential to cause outbreaks. In parallel, resource scarcity helps drive changing land use patterns and habitat alterations, creating new opportunities for the “spillover” of zoonotic diseases from wild animal populations to humans and their domesticated and companion animals. Once an infection occurs, the dynamic and complex flow of travel and trade can allow biological threats to spread rapidly within densely populated

urban areas and across international borders, especially where weak governance and inadequate infrastructure complicate public health surveillance and response. Fear and uncertainty during infectious disease outbreaks can be exploited through the spread of disinformation and misinformation to undermine public trust in governments, institutions, and technical authorities.

While infectious disease outbreaks may threaten U.S. personnel abroad and lead to outbreaks within the United States, the most severe consequences are likely to be felt by disadvantaged populations in low and middle-income countries (LMICs) that are already most susceptible to other impacts of climate change, environmental degradation, and food and water insecurity.

Approaches intended to mitigate these burdens pose risk-versus-risk quandaries. Investments in laboratory infrastructure and advanced molecular technologies in countries worldwide during the COVID-19 pandemic established foundations for new national, regional, and global systems to support early warning for emerging diseases, while creating new exposure risks in facilities operating without adequate training, resources, or oversight to sustain effective biocontainment and biosafety practices. The COVID-19 pandemic spurred increased interest in advanced biological research into emerging diseases despite the absence of global standards, regulatory frameworks and protective measures to safeguard against accidental or deliberate exposures. Rapid advances in biotechnologies promise to improve human health, mitigate environmental damage, and enhance the resilience and sustainability of agriculture systems. But these biotechnologies, which are inherently dual-use, might also "enable development of novel biological weapons that complicate detection, attribution, and treatment."[10]

In October 2022, the Administration updated the National Biodefense Strategy, recognizing that the U.S. cannot counter biological threats without addressing them globally, and called for a whole-of-government and whole-of-society approach to "limit health, economic, social, and national security impacts and consequences of nationally or internationally significant biological incidents, whether naturally occurring, accidental, or deliberate."

The Department of State is the lead USG agency to support global capacity building to detect and respond effectively to infectious disease outbreaks, to strengthen systems to prevent and mitigate deliberate or accidental biological incidents, and to deter biological weapons

development and use. Within the Department of State, responsibilities related to naturally occurring disease threats fall primarily to the Bureau of Global Health Security and Diplomacy, created in 2023, while responsibilities for the reduction and mitigation of accidental and deliberate biological threats fall under the T bureaus. In addition to prevention and mitigation, State must also prioritize enhanced resiliency of ecosystems and agricultural systems in partner countries most at risk from climate disruption.

To meet this challenge, the T bureaus and the State Department as a whole need multidisciplinary expertise and clear mechanisms for sustained communications and coordination. State should consider the example of the Department of Defense. Facing a similar challenge, the Department of Defense launched a Biodefense Council in 2023 to promote collaboration across the whole of the departmental biodefense enterprise.[11]

New Security Challenge III: The Weaponization of Inequality and Identity

The Administration, and the Department of State specifically, have prioritized equality and equity in both policy and personnel. It is clear that the Administration understands the maxim "nothing about us, without us," and is making efforts to retool the federal government in a way that looks more like America and is more responsive to our founding principle of "equality and justice for all."

The Administration has promulgated executive orders and national strategies on gender, race, and ethnicity as well as on diversity, equity, inclusion, and accessibility. It has created or restored a number of relevant senior roles and has achieved unprecedented levels of diversity in Cabinet, appointee, and career hiring.

However, the Department of State and other agencies have not matched this level of coherent focus on identity in their approach to security *policy.* This is an important oversight, as a growing body of scholarly evidence points toward the exploitation of identity-based bias, discrimination and violence as predictive factors for the rise of authoritarianism and the escalation of conflict.

Similarly, scholarly literature points to important corollaries between the wellbeing of minoritized groups and the security of states. Peace agreements are far more likely to endure when women and marginalized groups participate in negotiations, for example. The Women Peace and Security Act, passed by Congress and signed into law by President Trump in 2017, mandated that the Department of State and Pentagon enact and report on strategies to increase women's participation.[12]

Over the last decade, efforts to widen the security policy lens by considering identity have been credited for successes from the destruction of Syrian chemical weapons to the early identification of terror group movements and violence in the Middle East and Africa. These analytic approaches are now well-ensconced in the militaries of many U.S. allies, including NATO.[13]

A number of U.S. allies and partners have invested resources and political capital in penning foreign and development policies that directly articulate how issues of equity and inclusion are germane to national security objectives. For instance, Germany's first national security strategy asserts that the promotion of human rights, climate justice, sustainable development and gender equity will inform how it advances its security goals in its multilateral and bilateral efforts.[14] This cohort – which applies the name Feminist Foreign Policy for this approach – now includes more than a dozen nations in all U.N. regions, including both of our neighbors and many of our partners – a potential new geometry for U.S. cooperation at the United Nations and in other relevant fora.[15]

The U.S. government's attention to identity issues, including gender, is still in development and what analysis exists is fragmented. The Under Secretary of State for Arms Control and International Security makes concerted efforts to advance issues of equity and equality, for instance, by tapping diverse delegations to negotiate the U.S. position in various international security fora. But neither the T bureaus nor the Department as a whole have incorporated identity concerns into security mandates. This is a missed opportunity; efforts to prioritize identity as part of our international security apparatus are more likely to focus internally, for instance on our representation in U.S. delegations, than externally, engaging security analysts

and negotiators alike to apply a critical lens as to how these issues underline and enable worsening security conditions, exacerbate threats or could be addressed as part of solutions.

Broadening what we understand as a security challenge also opens up new strategic possibilities for the T bureaus. Supporting movements for human rights and inclusive and democratic societies led by social groups that have been traditionally among the most marginalized can improve the Department of State's understanding of risks and opportunities and open new geometries for multilateral engagement, cooperation, and advancement of the rules-based international order.

IV. Integrating New Security Challenges Regionally: Case Studies

New security challenges are destabilizing traditional U.S. security interests in a variety of ways, augmenting threats but also offering new avenues for planning, prevention, and response. We selected as case studies two regional priorities that pose very different challenges to the U.S. government, and which demand very different responses. The short analyses below do not aim to offer an in-depth look at Taiwan and the Sahel, or to elevate them above other challenges, but to offer a practical look at the range of ways new and traditional challenges intersect.

Drivers of Instability: The Sahel and Coastal West Africa

The Sahel and Coastal West Africa regions[b] are particularly vulnerable to the destabilizing effects of climate disruption, emerging diseases, and weaponization of identity due to compounding factors centered around resource scarcity and technological disadvantages.[16] Scarcity can take the form of global supply chain shortages due to famine, drought, poor governance, conflict, and war, as well as scarcity of critical materials used to power decarbonized energy systems. Technological disadvantages contribute to farming, irrigation and seeding problems. New security challenges in turn compound resource scarcity and

[b] The Coastal West Africa countries are, Benin, Ghana, Guinea, Guinea Bissau, Côte d'Ivoire, Liberia, Nigeria, Senegal, Sierra Leone, Togo. The Sahel region consists of Burkina Faso, Chad, Mali, Mauritania, Niger.

technological disadvantage, creating a vicious cycle. Climate-fueled drought is a driver and disruptor of water security, leaving nomadic herders fighting with farmers as "water and grazing land become scarcer."[17] A group of herders referred to as "fringe pastoralists" are engaged in mineral exploration and development, allied with civil war agitators and "jihadist groups." Resource scarcity coupled with lack of infrastructure and strong governance contributes to "pervasive insecurity" spurred by bad actors.[18]

Water insecurity is emboldening violent extremist organizations to restrict water, food, and shelter.[19] Climate-driven disruption of social patterns will further accelerate the movement of women into greater internal, strategic organizing roles inside violent extremist organizations.

The interactions of infectious disease and security are also all too clear in this region. The Ebola outbreak of 2014-16 in the fragile states of Guinea, Sierra Leone, and Liberia emphasized how inadequate infrastructure, weak governance, and lack of trust in public institutions allowed a localized outbreak to become a regional and global crisis.

The West African Ebola outbreak began in rural Guinea in late 2013, most likely through zoonotic transmission to a child in an area where deforestation has brought wild animals into closer contact with human settlements. Cases spread rapidly among household caregivers; highly mobile populations soon carried the virus across the porous borders with Sierra Leone and Liberia through social, labor, and trade networks. The outbreak went undetected for weeks due to weak public health infrastructure. Transmission chains reached the capital cities of all three countries, where the outbreak exploded in densely populated urban slums.[20] Fueled by widespread misinformation, communities frustrated by the inability of severely overstretched health officials and humanitarian organizations to meet their needs promptly resisted public health measures – sometimes violently. National authorities met community resistance with securitized responses that exacerbated distrust (particularly when interventions such as bans on public gatherings might be exploited politically), perpetuating state-security crises in parallel with the health emergency.

Prior to 2014, the largest reported Ebola outbreak had totaled 425 cases.[21] The 2014-16 epidemic led to more than 28,600 confirmed cases and nearly 11,300 deaths, and undermined a decade of investments in peacekeeping and state building in the sub-region.[22, 23] Economic

losses exceeding 3 percent of GDP and disruptions to agriculture in these three most affected countries perpetuated household food insecurity lasting beyond the epidemic.[24, 25]

The United States used the paradigm of investing in fragile states to reframe strategy toward the continent, through the Global Fragility Act and the Administration's Strategy Toward Sub-Saharan Africa. In addition, many T bureaus' initiatives and programs already look at the continent's challenges through the framework of the United Nations' Sustainable Development Goals (SDGs), with efforts to better respond to natural disasters, improve food security, adapt low carbon agriculture, increase access to water through demining efforts, and combat illicit arms flows.

The building blocks are available to help construct an integrative system across the T bureaus to address regional dynamics that are subject to new security challenges. However, capacity is where the T bureaus encounter roadblocks. These bureaus need the capacity to reimagine their priorities and commitments creatively, drawing together the SDGs and U.S. national security priorities.

A Potential Climate Scenario Affecting the Defense of Taiwan

Taiwan security contingencies are typically viewed through the prism of traditional signaling and deterrence challenges, historically core to T bureaus' mindset: ensuring that the government in Taipei doesn't provoke the mainland with a declaration of independence; deterring a military move by the PRC against the island with a strong regional presence and communicating clear messages; and coordinating with allies whose assistance would enhance the U.S. response.

The rapid onset of climate extremes introduces weather variables that add significant challenge and uncertainty to U.S. planning for the defense of Taiwan as well as for the continuity of certain national security-critical supply chains. Scenario analysis can be useful for considering the possible planning and expertise needs that come with climate change.

A super typhoon or other storm systems might, for example, knock out island infrastructure while leaving the mainland untouched; cause either U.S. or PRC infrastructure to go dark,

preventing one side from correctly perceiving the other's moves; block or delay the U.S. ability to defend and reinforce the island by sea and air; or preemptively disrupt critical supply chains (particularly high-end chips) for both the U.S. and global markets. It is easy to imagine that the United States might face a temporary loss of certain bases, not just its own but potentially those of allies in the region.

Given the possibility that the PRC might seek to take advantage of a catastrophic climate event to use military force against Taiwan, the U.S. government as a whole needs to develop analysis and planning for such scenarios and their implications, engage in outreach to key allies and partners to plan and prepare jointly for them, and identify key tipping points (i.e., predicted typhoon strength and path) and develop public responses to lower risk.

The T bureaus have a role to play in the development of this scenario planning by blending climate and weather analysis with political-military considerations. They can take the lead in explaining perceived risks in these scenarios to allies and partners, and potentially to Beijing. They can also develop de-risking and de-escalation mechanisms to share information on security implications of storm systems.

The added climate capacity recommended in this report will enhance the T bureaus' ability to perform these roles. A shift in expectations and training for T bureau staff that previously focused uniquely on the risks and management of nuclear, biological, and chemical weapons can expand analytic and programmatic abilities to handle these types of non-traditional systemic risks. Where the Under Secretary does not have the needed expertise, including relevant outside agencies and experts in Taiwan scenario, planning can itself send an important signal about how the T family understands the scope of the security challenge.

V. How the T Bureaus Tools Apply: Nuclear Energy and Climate Security

Avoiding the worst security outcomes of the climate crisis depends on accelerating our transition to clean energy. However, current global commitments under the Paris Agreement are not sufficient to stem projected increases in temperature past the goal of staying "well

below" 2 degrees Celsius of warming above pre-industrial temperature. Experts have mapped out what is required to avert the worst climatic risks. Achieving net-zero greenhouse gas emissions by 2050 could arrest current trends,[26] and more than 70 countries have committed to achieving this target.[27] There are few credible paths to net-zero that do not include nuclear energy. The International Energy Agency has developed a Net-Zero Emissions Scenario in which nuclear energy's output would need to rise by 40 percent by 2030 and at least double by 2050.[28] This would require roughly five times the current rate of growth, which would require significant political and economic investments. Such rapid growth in nuclear power generation would also raise significant safety and security concerns. As noted in the ISAB October 2023 Report on Artificial Intelligence and Associated Technologies, the T bureaus urgently need to develop expertise in this complex policy area at the intersection of traditional and new security challenges.[29]

Although the United States was once a dominant supplier of nuclear technology exports, it has fallen behind in its competitiveness. Stemming from trends that predated the invasion of Ukraine, Russia has become the dominant global supplier for nuclear reactors via Rosatom, with an order book of $130 billion. Russia also dominates the global nuclear fuel market. It is among the countries (including Australia, Kazakhstan, Canada, and Namibia) with the world's largest uranium production, an estimated 8 percent of global supply.[30] It holds about 38 percent of the world's uranium conversion capacity and about 46 percent of the world's enrichment capacity. Whether Russian actions compel the West to reduce its dependence on Russia's nuclear supply remains to be seen.

The PRC is also pursuing strategic plans to become a world leader in nuclear energy exports, in addition to being the current leader in terms of nuclear plants under construction domestically. For years, the PRC has inked notional nuclear cooperation agreements with dozens of nations around the world to facilitate future dialogue and possible reactor deals, linked directly to its Belt and Road Initiative. In 2023 the PRC announced plans to build a new nuclear plant in Pakistan. Though the PRC and Pakistan have had a long-term strategic relationship, Pakistan is not a party to the NPT and possesses nuclear weapons, raising continuing concerns.

The U.S. government is showing stronger signs of aiming to increase its role in nuclear technology exports, which will be important to preventing Russia and the PRC from exerting greater influence on global standards for nuclear safety, nuclear security, and nonproliferation. Moreover, the global web of nuclear energy deals dominated by Russia and the PRC complicates specific, already-complex geopolitical situations. Given this landscape, a central question today is whether the United States will deliberately pursue a stronger leadership role in this field and rekindle its long history as a global leader. Since President Eisenhower's Atoms for Peace initiative, the U.S. has conducted trade in nuclear technology for peaceful purposes. The 1954 Atomic Energy Act (AEA, subsequently amended) mandates a formal agreement, including stringent pledges against weaponization and proliferation, as a prerequisite for U.S. nuclear exports.[31] Such an agreement is called a 123 Agreement. As of December 2022, the U.S. has twenty-three 123 Agreements with 47 countries, the IAEA and Taiwan (negotiated through the American Institute in Taiwan).

Over the past few years, nuclear issues have become more prominent in U.S. foreign and security policy. Importantly, at the August 2023 NPT Preparatory Committee meetings in Vienna, U.S. leaders placed significant focus on the goals of expanding support for peaceful nuclear cooperation around the world as a means of meetings its commitments under Article IV of the NPT and strengthening international confidence in the NPT.

For the Indo-Pacific, the trilateral partnership between Australian, UK, and U.S. (AUKUS) has become a focal point for regional strategy and is game changing in the ambition level of its defense technology cooperation, including its provision of nuclear-powered submarine technology to Australia. In parallel, the United States has increased its focus on civil nuclear cooperation with Japan, including through the T family's WECAN program, as it considers rekindling a greater role for nuclear energy to help decrease vulnerabilities tied to exports from countries such as Russia.

In the Middle East, with European partners and the IAEA, the United States is continuing efforts to prevent Iran from nuclear weapons development and exploring nuclear cooperation with Saudi Arabia.

These U.S. policies are contested at home and abroad. The PRC has asserted that the nuclear cooperation that is part of the AUKUS deal weakens the Nuclear Non-Proliferation Treaty and poses proliferation risks (and is driving disinformation in this regard). Public reporting of 2023 negotiations with Saudi Arabia included the possibility of a U.S. partnership for uranium enrichment, which triggered a renewed wave of pushback from those that oppose sharing nuclear technology with Riyadh.

Once again, debates are being renewed about whether any future 123 agreement should require what is known as the "gold standard," whereby partner nations forswear enrichment and reprocessing, despite this being a feature of only a few existing nuclear agreements.

Indeed, whether and how the United States uses 123 Agreements as an effective, prominent tool of foreign policy will likely be a significant issue in the coming years. The Administration has elevated focus on them, from Ghana and Kenya to the Philippines, Thailand, and Mexico. Yet four existing 123 Agreements will require renewal or extensions prior to 2030.[32] The United States did not successfully conclude a follow-on agreement with Egypt after the prior 123 Agreement expired in 2021, and Russia appears to be moving ahead with Cairo to build a nuclear plant. In sum, as of October 2023, the United States had twenty-three 123 Agreements in force to govern peaceful nuclear cooperation with 47 countries, the IAEA, and governing authorities of Taiwan.[c]

Under Secretary Jenkins shared the Department of State's current approach in remarks at the Stimson Center on Oct 5, 2023.[33]

> *"The world needs clean, reliable, safe, and secure energy options to address the realities of climate change and move toward our shared net-zero 2050 goals, while meeting increasing energy requirements. Civil nuclear energy is an important part of that mix. Advanced nuclear technologies such as small modular reactors (SMRs) can help make this transition to a green economy with greater diversification and reliability in energy sources. They can be used for power generation, clean hydrogen production, industrial*

[c] One of the U.S. 123-Agreements is with the European Union, but the individual EU members are counted in the number of covered states. See: National Nuclear Security Administration, "123 Agreements for Peaceful Cooperation, " https://www.energy.gov/nnsa/123-agreements-peaceful-cooperation.

applications, process heat, desalination, or other uses. The United States supports nuclear newcomer countries in capacity building in a manner consistent with the IAEA Milestones Approach for implementing a responsible nuclear energy program through our Foundational Infrastructure for the Responsible Use of Small Modular Reactor Technology – or FIRST – program. With the United States leading the way, and while maintaining the highest standards of nuclear security, safety, and nonproliferation, SMRs are meaningful investments in long-term economic growth, including enabling advanced industrial development and generating jobs. The U.S. has provided $41.75 million towards FIRST since it was first announced in April 2021, has had over 125 FIRST capacity building engagements through 2023 and has trained over 1750 nuclear experts and officials through 2023 on workshops, webinars, technical consultancies, study tours and site visits. The U.S. and Japan jointly host the Winning an Edge through Cooperation in Advanced Nuclear (WECAN) to deepen cooperation to support the deployment of advanced, safe, and secure nuclear reactor technologies in responsible third countries and work towards Net Zero Emission goals. In addition, ISN is leading Project Phoenix, which will accelerate the global clean energy transition by supporting feasibility studies and providing technical assistance to support the pursuit of the conversion of coal-fired power plants to reliable and safe zero-carbon SMR nuclear energy generation."

The United States should deepen and expand the work of the Foundational Infrastructure for the Responsible Use of Small Modular Reactor Technology (FIRST) and Winning an Edge through Cooperation in Advanced Nuclear (WECAN) programs to make an even greater contribution towards achieving Net Zero Emissions goals. U.S. law requires a legally binding agreement for peaceful nuclear cooperation that involves U.S. transfers of nuclear power reactors, reactor components, or material to a partner country. The process for reaching these agreements, known as 123 Agreements, should be as streamlined as possible and consistent with U.S. law, while still providing the highest standards of nuclear security, safety, and nonproliferation. Requiring the so-called "gold standard" in a 123 Agreement, i.e., a legally binding obligation requiring the partner country to forgo all enrichment and reprocessing, may deter a prospective partner from buying nuclear reactors and material from the United States. Washington should nonetheless endeavor, where necessary, to obtain commitments in some form — not necessarily binding legal obligations in a 123 Agreement – from potential

partners to forswear all enrichment and reprocessing of nuclear material. Given the efforts to replace Russian enrichment capacity in the global market and meet expected growing demand for nuclear reactor fuel, the United States should develop a policy to guide future enrichment capacity development for partners who are non-nuclear weapons state parties to and in compliance with the Nuclear Non-Proliferation Treaty (NPT) and with their International Atomic Energy Agency (IAEA) comprehensive safeguards agreements including the Additional Protocol. Such policy should address, on the one hand, how to reduce the risk of break-out by a non-nuclear weapon state that acquires enrichment and reprocessing technology, and on the other how to address losses in the U.S. nuclear export market to sellers who do not require strict commitments for no enrichment and reprocessing.

VI. Climate Intervention - How the T Bureaus' Tools Apply

Arms control tools, from conceptualization and informal discussion to monitoring and verification, are one of T's core traditional strengths. They are of interest for a host of new security challenges. Below we consider the case of geoengineering. While the primary effort to address climate change is to limit carbon emissions, technologies designed to reduce its worst impacts may offer important options.[34]

As debates continue over whether and how, and by whom, geoengineering will be used, we highlight how some of the tools of arms control may be useful in understanding what other actors are doing and promoting fruitful dialogue.

Geoengineering strategies to date aim to cool Earth temperatures by adding reflective particles to the upper atmosphere (stratosphere), increasing cloud cover in the lower atmosphere, or by thinning heat-absorbing cirrus clouds to allow heat to escape. Given that the earth is currently on a trajectory to exceed 1.5°C warming by 2030, interest and attention to climate intervention is increasing significantly. The 2021 National Intelligence Estimate on Climate Change and International Response concludes that geopolitical tensions are likely to grow as countries

increasingly argue about how to accelerate the reductions in net greenhouse gas emissions that will be needed to meet the Paris Agreement goals.

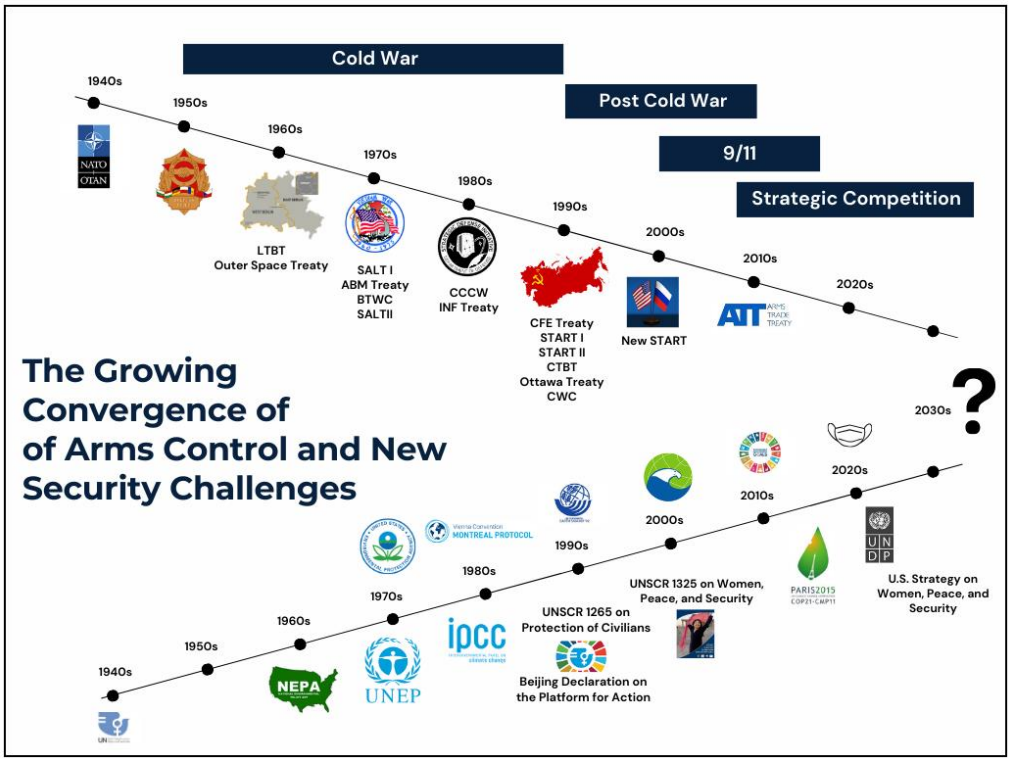
In 2023, the White House released a report requested by Congress on a Research Strategy for Solar Radiation Management.[35] This report calls for a risk-vs-risk framework for comparing climate change scenarios with and without SRM. The report also notes that scenarios and associated research should assess both climate and environmental impact, as well as feasibility of implementation. The report stresses that climate intervention research should include assessment of human and societal consequences, as well as scientific dimensions of SRM. The report calls for formation of a SRM Scenario Development Group engaging a dedicated and inter-disciplinary group of scientists and decision-makers with a range of expertise. Finally, the report also notes that the scenario development process would provide an important mechanism for international cooperation and dialogue focusing on SRM.

Even if pursued, solar geoengineering will not alone solve global warming, but may have limited applicability in certain circumstances. It may also have regional or global implications, both positive and negative, mandating that such an effort should be undertaken only if connected with international dialogue, negotiations, and community involvement. In light of the White House report of 2023, we recommend that the Department of State work with the interagency to determine whether an international or regional dialogue or forum is appropriate.[36]

The Under Secretary for Arms Control and International Security should consider two additional notable possibilities for diplomacy in this field: first, the Department of State may be able to utilize existing monitoring capabilities to better understand possible unplanned uses of SRM and to foster dialogue with other countries engaging in SRM research or planning. For example, existing monitoring capacities such as Sandia's Cooperative Monitoring Center, could be utilized to monitor and assess emerging new security challenges, including building cooperation around responsible research into the use of solar radiation or other geoengineering techniques by countries or organizations[37].

Second, the Department of State, utilizing the capabilities of the T bureaus, may be able to foster dialogue on responsible research and global standards and norms that should govern SRM and other geoengineering research.

VII. Effectiveness of Multilateral Agreements and Climate Change



The United States has long negotiated and implemented legally-binding, verifiable agreements to address weapons with implications for global stability and security. A constellation of arms control agreements, both bilateral and multilateral, has helped manage the security implications of nuclear, chemical, biological and conventional weapons and missiles. The wider arms control universe includes other tools, such as multilateral export control regimes including the Nuclear Suppliers Group, the Australia Group (chemical weapons), the Missile Technology Control Regime and the Wassenaar Group (conventional and dual use).

The arms control field is not immune from the effects of new security challenges. This is true for both the underlying sources of tension and conflict as well as U.S. military operations, including for nuclear weapons and alliance management. In the area of operations – which the Department of State does not set but must understand as it considers the future of nuclear norms, transparency, agreements, and verification – climate change can have significant implications. For example, sea level rise will impact most seaports in the next decades,

including those used for the United States' nuclear submarine forces. Extreme heat and flooding may also affect nuclear weapons bases, especially in the Midwest where temperatures have averaged above 90 degrees Fahrenheit and affected labor force hours, and floods may block roads to ICBM bases.

Existing arms control agreements remain squarely in the U.S. interest, including those that address nuclear, chemical and biological weapons. Each of these areas is likely to be directly affected by the direct and secondary impacts of climate change and as a result the T bureaus need to ensure their work is informed by and can anticipate the implications of these trends.

Nuclear Weapons

The Department of State has a key role in the development and design of arms control agreements that regulate the nuclear competition with Russia and, in the future, the PRC. Understanding the nuclear operations and capabilities of these states as well as the dangers they pose to stability and to the security of the United States and its allies is an essential task (see 2023 ISAB Report on Deterrence in a World of Nuclear Multipolarity).[38] Climate change and other new security challenges need to be factors in how the Department of State thinks about the future of such agreements, particularly their monitoring and verification. The process of accessing key nuclear sites in Russia (or the PRC) will need to include procedures that take into account the effects of major storms, flooding, and climate change more broadly. Accommodating such delays, and compensating by other means, may become more important to maintaining the United States' ability to effectively monitor agreements. New technologies may be identified for roles in such agreements, and including the impacts of climate change on them, may be a valuable arena for Department of State work.

As discussed above, climate will drive increased interest and likely reliance on nuclear power. The IAEA is tasked with ensuring the application of safeguards in order to verify that civil capabilities are not diverted to weapons development. The development and possible deployment of small modular reactors, along with the associated demands on both nuclear materials production and spent fuel management, will put significant demands on the IAEA and on the global nonproliferation monitoring system. Again, the Department of State will need to anticipate and prepare for these developments and rely on considerable government and at

times private expertise to ensure it can stay ahead of the technical curve on verification and monitoring.

Biological Weapons

The Biological and Toxin Weapons Convention (BWC) effectively prohibits the development, production, acquisition, transfer, stockpiling and use of biological and toxin weapons. It was the first multilateral disarmament treaty banning an entire category of weapons of mass destruction (WMD). The BWC lacks adequate staff and verification capabilities, but member states are considering enlarging the current Implementation Support Unit, which was created in 2006. A majority of member states also favor confidence-building measures (CBMs) and other partnering options such as laboratory visits which encourage more support for the BWC.

Climate disruptions and spread of infectious diseases, including the major Ebola virus disease outbreak in West Africa and the COVID-19 pandemic, and the interest that these drivers have created in research, development, and deployment of biotechnologies to reduce risks and mitigate impact, have impacted the BWC. The BWC is designed to address dual-use technologies, but the complexity and speed of advances in emerging technologies – many comprising a convergence of biological, chemical, physical, and information science disciplines – present challenges for risk assessment. The acceleration of biological risks tied with climate change, combined with associated advancements in technology including bioengineering and machine generated learning, have the potential to dramatically transform the biological weapons landscape in the decades to come. The Department of State is not a technical agency, but must have the ability to understand and anticipate these trends if the United States is to be able to apply arms control and normative tools to managing these risks.

Chemical Weapons

The Chemical Weapons Convention (CWC), among the most universal treaties today with 193 member states, bans a whole category of weapons of mass destruction. One of the most successful treaties, the CWC was signed in 1993 by over one hundred countries and ratified in 1997 by the United States. Twenty-six years later, it has achieved the safe and verified destruction of all declared chemical weapons stockpiles, over 72,000 metric tons, in eight

possessor states. The CWC requires all States Parties to declare all work in chemical weapons since 1946 and bans all development, production, testing, and stockpiling of chemical weapons, verified by on-site inspections and annual declarations. Chemical weapons remain the WMD category risk with the lowest bar to entry for states and subnational groups. How the disruptions sparked by new security challenges may drive interest in and use of chemical weapons (CW) by new actors remains unclear. However, the task of supporting the OPCW and the need for the Department of State to provide technical support to the OPCW, allied states and the broader international community can be expected to change radically in the coming decades.

As the CWC faces state and non-state use of chemical weapons in Syria and elsewhere, and three chemical assassination attempts in Malaysia (2016), England (2018), and Russia (2020), it is more important than ever for state parties to support these multilateral arms control and disarmament efforts.

VIII. Topics for Further Study

The effects of new security challenges have been visible across arms control domains, from the effects of COVID-19 on international meetings to the challenges posed by heat and flooding to weapons deployments.

A future ISAB report could explore in greater depth how these new security challenges could undermine, shape, or strengthen specific existing arms control and risk reduction efforts, let alone future agreements. Areas where new security challenges can impact past and current agreements and key security challenges to the United States also include conventional weapons, transparency, and treaties related to outer space and the seabed. While it is beyond the scope of this report to determine what the future of the arms control landscape looks like, it remains clear that the Department of State will continue to play a key role in identifying and working to secure future agreements and that it must continue to increase its technical skills and broaden its view to ensure it can remain ahead of the security landscape in these areas.

In addition, while this ISAB report briefly mentions migration, this rapidly-expanding phenomenon deserves greater attention as a climate-linked new security challenge with enormous implications. Indeed, it deserves its own ISAB study.

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Appendix A – Terms of Reference

UNDER SECRETARY OF STATE FOR ARMS CONTROL AND INTERNATIONAL SECURITY WASHINGTON

October 18, 2022

MEMORANDUM FOR THE CHAIRMAN, INTERNATIONAL SECURITY ADVISORY BOARD (ISAB)

SUBJECT: Terms of Reference - ISAB Study on New Security Challenges

The International Security Advisory Board (ISAB) is requested to undertake a study to advise the United States government on how transnational challenges such as resource scarcity and climate change affect the traditional international security work that falls within the mandate of the T Bureaus.

The current geopolitical context demonstrates that transnational threats outside the traditional international security arena, such as infectious diseases and resource scarcity (including water, energy, and food scarcity), can drive and exacerbate international insecurity and conflicts. Displacement from disasters and the politicization of refugee flows, whether from conflict or famine, can destabilize political and security relations. Increasing water scarcity in various regions, including the Middle East, Latin America, Africa, Asia, and parts of the United States raises the risk that shared water resources among states may become tense as geopolitical competition grows. There can also be feedback effects of cascading security crises, as when Russia's 2022 invasion of Ukraine globally disrupted energy and food markets, causing global price spikes, severe food and energy shortages, and increased risks of conflict in and spreading from distant countries.

Analysts expect these security trends to worsen, particularly due to the accelerating impacts of climate change. A 2021 National Intelligence Estimate assessed that "climate change will increasingly exacerbate risks to U.S. national security interests as the

physical impacts increase and geopolitical tensions mount about how to respond to the challenge." Potential responses by countries to these challenges (such as unilateral damming of rivers) could create additional risk of conflict. In addition, these dynamics (driven by constraints on energy, human capital, or need to secure natural resources) can negatively impact the sustainability of Departmental programs and assistance both from the perspective of prioritizing international security issues by the recipient country and from the perspective of long-term, sustained expert engagement.

It would be of great assistance if the ISAB were to study how these issues intersect with and affect the Department's programs in international security, nonproliferation, and arms control to better understand how relevant bureaus can address new threats posed by these non-traditional problem sets. These questions include:

- How do non-traditional international security issues, specifically climate change and resource scarcity, create new challenges and opportunities for U.S. global security policy?
- How can potential unilateral or multilateral responses affect those challenges, including how they may further aggravate or address them?
- How should U.S. thinking about the drivers and effects of international security challenges adapt to this rapidly changing environment?
- How do these challenges affect the ability for the United States to negotiate, implement, and verify international agreements in arms control and nonproliferation and affect the U.S. ability to provide security assistance?
- How can the Department better broaden the concept of security assistance to include linkages to developmental needs that address root causes of specific conflicts?
- Is there a role for new types of risk reduction, early warning systems, and confidence building measures, including drawing from non-security disciplines such as economics or sociology, to respond to non-traditional security challenges?

- What does the Department need, in human capital, financial assets, technical tools, or organizational structure, to meet these evolving security challenges?
- How should the Department's arms control, nonproliferation, and international security bureaus adjust to address these threats?

In the conduct of its study, as it deems necessary, the ISAB may expand upon the tasks listed above. I request that you complete the study in 180 days. Completed work should be submitted to the ISAB Executive Directorate no later than April 2023.

The Under Secretary of State of State for Arms Control and International Security will sponsor the study, as sponsor of the International Security Advisory Board. Rachel Thomas will serve as the Executive Secretary for the study and Michelle Dover will represent the ISAB Executive Directorate.

The study will be conducted in accordance with the provisions of P.L. 92-463, the "Federal Advisory Board Committee Act." If the ISAB establishes a working group to assist in its study, the working group must present its report or findings to the full ISAB for consideration in a formal meeting, prior to presenting the report or findings to the Department.

Bonnie D. Jenkins

Appendix B – Members and Project Staff

Board Members

- Hon. Edwin Dorn (Chair)
- Ms. Sherri Goodman (Vice Chair)
- Dr. Daniel Byman
- Hon. Patricia Falcone
- Dr. Julie Fischer
- Dr. James Goldgeier
- Dr. Gigi Kwik Gronvall
- Dr. Gregory Hall
- ADM Cecil Haney, USN (ret.)
- Dr. Eboni Haynes
- Ms. Julie Herr
- Dr. Michael Horowitz
- Ms. Heather Hurlburt
- Hon. Shirley Ann Jackson
- Amb. (ret.) Laura Kennedy
- Dr. Susan Koch
- Dr. Edward Levine
- Dr. Jeffrey Lewis
- Hon. Jamie Morin
- Hon. Eric Rosenbach
- Dr. Ian Simon
- Ms. Lyric Thompson
- Dr. Paul Walker
- Dr. Heather Williams
- Mr. Jon Wolfsthal

Study Group Members

- Ms. Sherri Goodman (Chair)
- Dr. James Goldgeier
- Dr. Julie Fischer
- Dr. Eboni Haynes
- Ms. Heather Hurlburt
- Ms. Lyric Thompson
- Dr. Paul Walker

Project Staff

- Ms. Rachel Thomas, Executive Secretary
- Ms. Kate Guy, Subject Matter Expert
- Ms. Michelle Dover, Executive Director, ISAB
- Mr. Scott Bohn, Deputy Executive Director, ISAB
- Ms. Thelma Jenkins-Anthony, Senior Advisor, ISAB

Appendix C – Individuals Consulted by the Study Group

December 16, 2022

Briefer	Office of Nuclear Energy, Safety and Security, Bureau of International Security and Nonproliferation, State
Ms. Maxine Burkett	Deputy Assistant Secretary, Bureau of Oceans, International Environment, and Scientific Affairs, State
Mr. Eric DeSautels	Office Director, Bureau of Arms Control, Verification and Compliance, State
Ms. Katrina Fotovat	Senior Official, Secretary's Office of Global Women's Issues, State
Ms. Stacy Gilbert	Senior Civil-Military Affairs Advisor, Bureau of Population, Refugees and Migration, St, State
Dr. Mark Goodman	Senior Scientist, Bureau of International Security and Nonproliferation, State
Dr. Christopher Kennedy	Director for Climate and Environmental Security, National Security Council
Mr. Adam Mausner	Policy Advisor, Bureau of Conflict and Stabilization Operations, State
Ms. Luna Ruiz	Data Analyst, Bureau of Conflict and Stabilization Operations, State
Ms. Erin Sikorsky	Director, Center for Climate and Security, Council on Strategic Risks
Mr. James Turnwall	Strategic Advisor, Bureau of Political-Military Affairs, State

Ms. Swathi Veeravalli	Director of Climate Security and Adaptation, National Security Council
Ms. Anne Witkowsky	Assistant Secretary, Bureau of Conflict and Stabilization Operations, State

January 31, 2023

Briefers	Intelligence Community
Dr. Cary Fowler	Special Envoy, Global Food Security, State

March 29, 2023

Dr. Natasha Bajema	Director of the Converging Risks Lab, Council on Strategic Risks
Ms. Heather Von Behren	Nuclear Energy, Safety and Security Deputy Director, Bureau of International Security and Nonproliferation, State
Dr. Dafna Rand	Director, Office of Foreign Assistance, State
Mr. Justin Friedman	Senior Advisor, Bureau of International Security and Nonproliferation, State
Mr. James Turnwall	Strategic Advisor, Bureau of Political-Military Affairs
Ms. Meredith Sundlof	Chief of Staff, Bureau of Political-Military Affairs
Mr. Anthony Wier	Deputy Assistant Secretary, Bureau of International Security and Nonproliferation, State

April 26, 2023

Ms. Gayatri Patel	Vice President of External Relations, Women's Refugee Commission
Mr. Kyle Peterson	Managing Director for Regional and Global Issues, Office of Foreign Assistance, State

Mr. Greg Pollock	Principal Director/Senior Advisor, Office of the Secretary of Defense, DoD

June 6, 2023

Mr. Jason Bordoff	Founding Director, Center on Global Energy Policy, Columbia University School of International and Public Affairs
Dr. Arati Prabhakar	Director, Office of Science and Technology Policy

June 20, 2023

Briefers	Climate Coordinators, State
Mr. Derek Chollet	Counselor, State
Dr. Molly Jahn	Office of the Under Secretary of Defense for Research and Engineering, DoD
Mr. Joseph D. Martin	Director, Center for Excellence in Disaster Management and Humanitarian Assistance U.S. Indo-Pacific Command, DoD
Briefer	Intelligence Community

June 23, 2023

Dr. Aubrey Paris	Policy Advisor, Secretary's Office of Global Women's Issues

June 30, 2023

Ms. Rachel Vogelstein	Special Assistant to the President, Gender Policy Council; Special Advisor on Gender, National Security Council

August 23, 2023

Dr. Mahlet Mesfin	Policy Planning Staff, State
Ms. Stephanie Gilbert	Policy Planning Staff, State

October 27, 2023

Briefers	Intelligence Community