

Task Force 3: Environment, Energy and Sustainable Development

# Securing the Future: Climate Change and Energy Security Risks and the G7's Role

Authors

Adeel Kadri

Janani Vivekananda

Naoyuki Okano

# Key Points

- Climate change undermines national and human security in and beyond G7 countries, especially in fragile regions, through indirect pathways, such as compromised livelihoods and displacement, food and water insecurity, and resource competition.
- The G7 countries must reconcile the need for energy security with global climate goals. This involves securing critical mineral supply chains while accelerating energy transition and decarbonization.
- Critical minerals are central to geopolitics due to their uneven distribution and concentration. By strengthening diplomatic and trade ties, the G7 countries can reduce geopolitical risks while promoting sustainable extraction practices globally.
- G7 countries must uphold climate justice commitments to the Global South to strengthen multilateralism and international solidarity.

## Introduction

Climate change and energy insecurity pose significant threats to global stability. These dual challenges are not only exacerbating existing geopolitical tensions, especially through the intensified demand for critical minerals, but are also creating new risks for international stability and resilience. This brief sets out seven questions and concomitant recommendations to provide strategic guidance for the G7 to effectively address these intertwined challenges through enhanced cooperation and innovation, ensuring a stable and sustainable future. G7 countries can and should play the central role in the world's efforts to address the threats of climate change and energy insecurity to global stability with its significant economic power and political influence. The recommendations of this brief emphasize the interconnected challenges of climate change, energy security and international stability as well as highlight the opportunities for multilateral cooperation and innovation across G7 countries in addressing these issues.

## Background and Context

Climate change and energy insecurity threaten fragility and human security through a range of context-specific pathways, including increased likelihood of population displacement, food and water insecurity, and conflicts over resources, which potentially undermine global security. These impacts are particularly acute in regions already grappling with social, economic, political, and governance challenges, where authorities are unable (or unwilling) to protect people from the effects of climate change. These impacts are especially destabilizing where there is inequity in adaptive capacity - some parts of society are less able to cope with and adapt to climate impacts - by virtue of their identity (gender, age, ethnicity, religion), intersectionality or geography. The rapid energy transition to meet climate goals likewise potentially has negative impacts to marginalized populations through extractive activities or transitions in energy systems, especially when rights-based approach and just transition are not sufficiently implemented. Moreover, the

global transition to clean energy has intensified the demand for critical minerals, which are essential for renewable technologies, electric vehicles (EVs), and battery storage systems. These minerals—including lithium, cobalt, nickel, graphite, and rare earth elements—form the backbone of the energy transition but also present significant challenges related to energy security and global supply chains. The increasing reliance on these materials poses risks of supply bottlenecks, geopolitical tensions, and market volatility, all of which have profound implications for global stability and the G7's strategic objectives. Climate change and energy insecurity thus pose significant challenges to geopolitics and global stability which G7 countries must address urgently, with even graver risks for populations living in fragile and conflict-affected regions, which are already facing weak governance, poverty, and marginalization.

## Seven Questions for the G7

The dual challenge of climate change and energy insecurity has complex and multifaceted aspects. The list of questions below are meant to explain key dynamics and implications of this challenge which demand attention by the G7 countries to develop concerted cooperation.

i. **Effectiveness of Multilateralism: How effective will multilateralism be in coordinating international efforts to address climate and energy challenges?**

Multilateralism is crucial for G7 countries to address climate and energy challenges, but in these evolved geopolitical times regional (rather than international) alliances will likely come to the fore. For instance, the European Union's collective climate policies demonstrate how coordinated efforts can lead to significant advancements in carbon reduction. However, the effectiveness of these efforts hinges on sustained international cooperation, which can be challenging amidst differing national interests. The Paris Agreement will be a testament to successful multilateralism. The U.S. withdrawal underlines the fragility of such agreements and the need for robust frameworks that can withstand political changes. The current geopolitical context requires the G7 to explore new regional alliances and interest-focused 'mini-lateral' partnerships to advance action on energy and climate change.

ii. **International Solidarity: To what extent will shared climate challenges strengthen international solidarity?**

Climate change can strengthen international solidarity among G7 nations by fostering a shared sense of purpose if G7 states are seen to be upholding commitments to meet expectations of the Global South on climate justice. This is particularly relevant as these countries face common threats such as rising sea levels and extreme weather events, whilst having done the least to contribute to these risks. However, the perceived failure of a number of G7 countries to shoulder their responsibilities to support adaptation and mitigation efforts undermines international solidarity. Efforts by the G7 to equitably meet shared climate challenges, with commitments to phase out coal and increase climate financing, can strengthen global cooperation and potentially reduce growing

fissures within multilateral institutions such as the UN Security Council and the UN system writ large.

- iii. **Instability in Fragile Settings: How and where will climate change fuel instability across fragile settings around the world?** Instability in fragile regions can lead to increased development, humanitarian and security challenges for G7 countries. Climate change typically undermines security through indirect pathways, by compromising livelihoods, forcing people to migrate, or by increasing competition for essential natural resources, e.g. water, fish stocks, arable land, etc. This is where the seeds of instability are sown. This is also the most effective intervention point for conflict prevention and stabilisation engagement - to prevent the escalation into widespread and seemingly intractable conflicts as we see across regions as varied as Haiti, Yemen, Mali, Myanmar, the Philippines, Colombia, and the Lake Chad basin – as well as a critical component of ensuring sustainable peace once violence comes to an end, for example in Sri Lanka, Iraq, Syria and the Western Balkans.
- iv. **Food Prices and Instability: How will climate change affect the G7s food security and the stability of food systems?** Rising food prices due to climate change can lead to economic instability and social unrest, affecting domestic markets and international trade as well as peace and stability. The 2008 global food crisis, driven by climate-induced crop failures, led to increased food prices worldwide, impacting economies and leading to social unrest in several countries. At the same time, the global food system is also responsible for over a quarter of global greenhouse gas emissions, thus a major driver of climate change. G7 countries can reduce these risks by supporting climate and conflict sensitive food systems as well as support efforts to disincentivise food export bans and hedging on food commodities.
- v. **Energy Security and Climate Objectives: How can the G7 lead global efforts to align energy security with climate objectives, ensuring a stable and resilient international community?** The G7 faces a dual imperative: ensuring energy security while advancing global climate goals. Critical minerals are central to this alignment, as they are vital to clean energy technologies such as solar panels, wind turbines, and electric vehicles. To reconcile these objectives, the G7 must implement policies that secure mineral supply chains while accelerating decarbonization. The International Energy Agency (IEA) has published a comprehensive report outlining the future trajectory of the global energy landscape. The IEA's 2024 report emphasizes that the growing demand for critical minerals could threaten climate ambitions unless proactive measures are taken. Diversifying supply sources, investing in alternative technologies, and promoting circular economy practices can reduce the environmental impact while enhancing supply chain resilience. For instance, improving battery recycling and reducing dependency on virgin materials can alleviate pressure on primary supply chains.

- vi. **Geopolitical Significance of Critical Minerals: How can G7 mitigate the geopolitical risks associated with critical mineral supply chain dependencies to ensure energy security and economic resilience?** Critical minerals have become a focal point of international geopolitics due to their uneven geographic distribution and the concentration of supply chains in a few key countries. As the International Energy Agency's (IEA) Global Critical Minerals Outlook 2024 underscores, China dominates the global supply chain for refined materials, accounting for over 90% of battery-grade graphite and 77% of refined rare earth elements. This geographic concentration poses a strategic vulnerability for the G7 nations, as any disruption to these supply chains due to trade restrictions, geopolitical conflicts, or environmental disasters could severely impact clean energy transitions and broader economic security. The IEA report highlights the **"N-1" risk scenario**, which models the impact of losing the largest supplier in a critical mineral supply chain. Under this scenario, only **70% of copper** and **50% of lithium** needs will be met by 2035 based on current project commitments. These projected shortages underscore the urgency for the G7 to **diversify sourcing, develop alternative supply chains, attract private investment, and strengthen international partnerships** to reduce reliance on a few dominant suppliers.
- vii. **Supply Chain Chokepoints of Critical Minerals and Vulnerabilities: How can the G7 address supply chain chokepoints and investment barriers to ensure a stable and sustainable critical minerals supply for the energy transition?** The supply chain for critical minerals faces several structural vulnerabilities. According to the World Economic Forum's (WEF) Securing Minerals for the Energy Transition 2024, these chokepoints include high capital expenditures for new mining projects, lengthy permitting processes, and limited recycling infrastructure. The report emphasizes that the average timeline from mineral discovery to production exceeds 16 years, leading to long lead times that fail to keep pace with surging demand. This delay in scaling up supply exacerbates market tightness and heightens the risk of price volatility, threatening the affordability and accessibility of critical minerals. Furthermore, the WEF report outlines barriers to investment and innovation, such as inconsistent environmental, social, and governance (ESG) standards and the financial risks of early-stage projects. Addressing these barriers requires coordinated international action to streamline permitting, improve data transparency, and provide financial incentives for sustainable mining practices. Without these measures, critical mineral supply chains will remain susceptible to external shocks, posing a direct threat to energy security.

## Recommendations

Following the articulation of the challenges of climate insecurity and its implications, below is the list of concrete recommendations for the G7 countries. This brief classifies recommendations into two broad sets of actions: G7's proactive cooperation on addressing climate-related security risks, and G7's role in enhancing partnerships for

critical minerals. In essence, these recommendations emphasize the importance of a holistic approach to building capacity in vulnerable regions, leveraging governance, community involvement, finance, education and technology to foster peace and resilience.

## **G7's Proactive Cooperation on Addressing Climate-Related Security Risks**

- i. **Policy Integration and Coherence:** Integrating climate and energy policies can significantly enhance resilience by ensuring that energy systems are both sustainable and secure. This approach involves aligning regulatory frameworks to support renewable energy adoption, while simultaneously addressing climate adaptation and mitigation strategies. For example, Germany has been a leader in the *Energiewende*, which is its transition to renewable energy sources. Domestically, this involves significant investment in wind and solar power, aiming to phase out nuclear energy and reduce reliance on fossil fuels. Internationally, Germany supports climate and energy initiatives through the International Climate Initiative (IKI), which funds projects in partner countries to promote renewable energy and energy efficiency. Japan has also invested heavily in energy efficiency and renewable energy technologies domestically, such as solar and hydrogen energy. It also supports international climate and energy efforts through the Japan International Cooperation Agency (JICA), which funds development projects focused on renewable energy and climate resilience in partner countries. By creating synergies between climate and energy policies, the G7 can foster a more cohesive and effective response to the dual challenges of climate change and energy security, ultimately leading to more robust and adaptable energy systems.
- ii. **Strengthening Local Governance and Institutions:** Empowering local governance structures is crucial for enhancing resilience in vulnerable regions. By providing training and resources, G7 countries can achieve a dual dividend of strengthening local governments' ability to manage climate risks effectively as well as contribute to bolstering the social contract, democratic institutions and sustainable reconstruction in fragile contexts. This includes developing transparent and accountable systems that can respond swiftly to climate-related challenges. For example, initiatives such as capacity-building workshops and exchange programs can enhance the skills of local officials in climate risk assessment and disaster management. For instance, Germany's support for local governance in sub-Saharan Africa includes training programs that improve local leaders' ability to implement sustainable development projects.
- iii. **Promoting Community-Based Adaptation:** Locally informed, community-based adaptation strategies are vital for ensuring that climate resilience efforts are tailored to local needs and conditions. G7 countries can support projects that involve local communities in planning and implementing adaptation measures, ensuring that these initiatives are culturally appropriate and sustainable. In Haiti,

for example, community-based responses to environmental management and sustainability focussing on nature-based solutions, including agroecological approaches, afforestation projects, sustainable charcoal production practices, protection of marine resources, effective water management and the creation of green jobs promotes inclusivity, empowers Haitian youth, women and other marginalised people, thus enhancing local stability and climate resilience. These projects, supported by international partners, demonstrate the importance and value of locally led efforts, even in the face of fragile governance structures.

- iv. **Enhancing Access to Climate Finance:** Access to climate finance is essential for vulnerable regions – especially already fragile contexts - to address climate risks. G7 countries can play a pivotal role in facilitating access to international climate funds and developing innovative financing mechanisms tailored to the needs of these regions. For example, several G7 countries, including Germany and the United Kingdom, are major contributors to the Green Climate Fund (GCF). The GCF is designed to assist developing countries, including fragile states, in financing projects that combat climate change. Similarly, several G7 countries support the Adaptation Fund which contributes to enhancing water security, agriculture, and infrastructure resilience in fragile states, and climate risk insurance initiatives such as the InsuResilience Global Partnership which aims to increase access to climate risk insurance for fragile countries. But despite the existence of such mechanisms, the barriers to access for fragile states are high and there are several ways G7 members can improve their efforts. Firstly, they can increase contributions to climate funds. Secondly, they can simply access procedures, using their leverage on the large climate fund boards to advocate for simplified and streamlined application, disbursement and reporting processes within these funds, ensuring that states with limited administrative capacity can more easily obtain funding. Thirdly, G7 countries can explain programs that provide technical assistance or technology transfer to fragile states – which can be of mutual interest as it offers G7 members diplomatic soft power as well as access to new markets. And finally, G7 members can support the development and implementation of innovative financing mechanisms, such as blended finance models, which combine public and private investments. These models can attract private sector funding and increase the overall financial resources available for climate projects in fragile states.
- v. **Research & Development, Education, and Capacity Building:** Promotion of research and development initiatives focused on sustainable resource use are instrumental. This includes providing financial incentives for private sector innovation and supporting public research programs. Furthermore, aligning innovation policies across member states can accelerate the deployment of breakthrough technologies and reinforce collective energy security goals. Initiatives aimed at building capacity in vulnerable regions are crucial for empowering communities to effectively manage climate risks. This includes providing technical assistance, funding for local climate adaptation projects, and facilitating knowledge exchange and training programmes. By enhancing local

capabilities, the G7 can help these regions develop and implement tailored strategies that increase their resilience to climate impacts and conflict, thereby contributing to global stability and sustainable development. Investing in education and capacity-building initiatives is critical for empowering local populations to tackle climate challenges. G7 countries can support educational programs that focus on climate science, sustainable agriculture, and renewable energy technologies. For example, educational partnerships, such as those between Canadian universities and institutions in the Pacific Islands, provide training in climate adaptation strategies and renewable energy technologies, equipping local communities with the skills needed to build resilience.

## G7's Role in Enhancing Partnerships for Critical Minerals

- vi. **Multifaceted approach:** Ensuring energy security in the context of critical minerals involves a multifaceted approach. This includes enhancing supply chain resilience through diversified sourcing and strategic stockpiling, fostering public-private partnerships to drive innovation, and promoting recycling and circular economy models to reduce primary material dependence. Both the IEA and WEF reports advocate for stronger multilateral cooperation to mitigate geopolitical risks and reinforce supply chains. The IEA emphasizes that USD 800 billion in mining investments will be required by 2040 to meet the Net Zero Emissions (NZE) scenario, while the WEF calls for international collaboration to harmonize ESG standards and reduce commercial risks. By aligning policy frameworks and investing in sustainable supply chains, the G7 can play a pivotal role in securing the materials needed for a low-carbon future while safeguarding global energy stability. The intersection of energy security and critical minerals presents both a challenge and an opportunity for the G7. Addressing supply chain vulnerabilities and geopolitical risks will require a concerted effort to diversify supply, foster innovation, and engage in collaborative frameworks. As the energy transition accelerates, the G7's leadership in securing critical mineral supply chains will be instrumental in shaping a resilient, sustainable and secure global energy future.
- vii. **Investment in Infrastructure:** Strategic investments in conflict-sensitive energy infrastructure and critical mineral supply chains are essential to support the peaceful transition to clean energy and bolster energy security. This includes ensuring equitable benefit sharing when modernising grid systems to accommodate renewable energy sources, developing technologies for energy storage, and securing sustainable supply chains for critical minerals necessary for green technologies. By prioritising these investments, the G7 can ensure a reliable energy supply that is less vulnerable to disruptions, better equipped to meet future demand, and which can contribute to peace and stability.
- viii. **Role of International Partnerships:** International partnerships are crucial for securing critical mineral supply chains and thereby ensuring long-term energy resilience. No single nation can address the complex challenges of critical mineral supply alone. Multilateral initiatives can facilitate knowledge sharing, enhance market transparency, and pool investment resources. The G7 can lead



efforts to develop international partnerships by fostering regional cooperation and supporting new entrants in critical mineral markets. Programs like the Mineral Security Partnership (MSP) can serve as models for collaborative action. In addition, engaging with developing economies that possess untapped mineral reserves is essential to diversify global supply and foster equitable economic growth. By strengthening diplomatic and trade ties, the G7 can reduce geopolitical risks while promoting sustainable extraction practices globally. These partnerships should prioritize environmental and social governance (ESG) standards to ensure that mineral development aligns with global sustainability goals.

- ix. **Facilitating Technology Transfer and Innovations:** Technology transfer and innovation are key to building resilience in vulnerable regions. G7 countries can support the transfer of climate-smart technologies and foster innovation through partnerships with local research institutions. For example, Japan's collaboration with Southeast Asian countries in deploying early warning systems for natural disasters illustrates how technology transfer can enhance regional resilience to climate impacts. Technological and policy innovations are vital to sustaining the energy transition while addressing the vulnerabilities in critical mineral supply chains. Advanced extraction methods, battery recycling technologies, and the development of alternative materials can mitigate supply constraints and reduce environmental impact. The G7 must emphasize the need for innovation across the value chain, including exploration, processing, and recycling. Emerging technologies such as direct lithium extraction (DLE) and advanced battery chemistries can reduce dependence on scarce materials. Additionally, digital tools for supply chain monitoring can improve transparency and risk assessment.

## Conclusion

In conclusion, the intertwined challenges of climate change and energy insecurity demand urgent and strategic action from the G7. Climate change exacerbates security risks across fragile regions by undermining livelihoods, increasing displacement, and intensifying resource competition. Concurrently, the global energy transition heightens demand for critical minerals, posing risks to supply chains and geopolitical stability. The G7's pivotal role lies in reconciling energy security with climate goals, ensuring sustainable extraction practices, and upholding climate justice commitments to the Global South. To effectively address these challenges, the G7 must enhance multilateral cooperation and innovation, aligning efforts with the G20 to foster a stable and sustainable future.

The urgency of these issues calls for increased contributions to climate funds, streamlined access procedures, and strengthened local governance and institutions. Promoting community-based adaptation and enhancing access to climate finance are crucial steps in building resilience. Moreover, investing in research, education, and capacity-building initiatives will empower vulnerable regions to tackle climate risks effectively.

The G7's leadership in securing critical mineral supply chains is vital for energy security and global stability. By diversifying sourcing, fostering innovation, and engaging in international partnerships, the G7 can mitigate geopolitical risks and reinforce supply chains. Strategic investments in infrastructure and technology transfer will further bolster resilience. As the energy transition accelerates, the G7's commitment to these strategic objectives will be instrumental in shaping a resilient, sustainable, and secure global future. It is imperative that the momentum of cooperation continues, aligning with the G20 to address these pressing challenges collectively.

## Author Biographies

**Adeel Kadri** is an economist specializing in macroeconomic policy, trade facilitation, and regional connectivity, with extensive experience in policy research and economic development. He has been actively engaged in shaping economic policies, particularly in South and Central Asia, focusing on multimodal logistics, trade corridors, and sustainable economic integration.

Adeel is working as a Senior Researcher with Manzil Pakistan, a policy think tank, where he contributed to key research and advocacy efforts on economic governance, trade, and infrastructure development. He is also a regular contributor to Think 7 (T7), the official engagement group of the G7, where he provides insights on global trade policies, critical minerals, and economic security.

In addition to his professional work, Adeel has been admitted to Columbia University's School of International and Public Affairs (SIPA) for the MPA in Economic Policy Management, supported by the prestigious Joint Japan/World Bank Graduate Scholarship.

With a strong foundation in policy research, trade facilitation, and regional development, Adeel continues to contribute to policy dialogues, aiming to enhance economic resilience and cooperation in the broader Eurasian region.

**Janani Vivekananda** is a Senior Fellow at the Todo Peace Institute and the Head of Programme Climate Diplomacy and Security at adelphi, where she specialises in climate change and peacebuilding. Working as a field researcher, practitioner and policy advisor on climate change, peace and security across different geographic regions for over 18 years, she has published widely on this topic, in academia, including Nature, and in global media outlets, such as the Economist, the Guardian, der Spiegel, and the BBC. Before joining adelphi, Janani was the Head of the Environment, Climate Change and Security at International Alert. Prior to this, she held advisory positions at Plan International, and UNDP. Janani holds a master's in Violence, Conflict and Development from the School of Oriental and African Studies (SOAS), and a BA in Politics, Philosophy and Economics from Oxford University. She is also a Senior Fellow at United Nations University Centre for Policy Research.

**Naoyuki Okano** is a Policy Researcher at the Adaptation and Water Area, Institute for Global Environmental Strategies (IGES). His expertise is international climate change law, climate change adaptation policy, and the nexus of climate and security. He is leading the

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