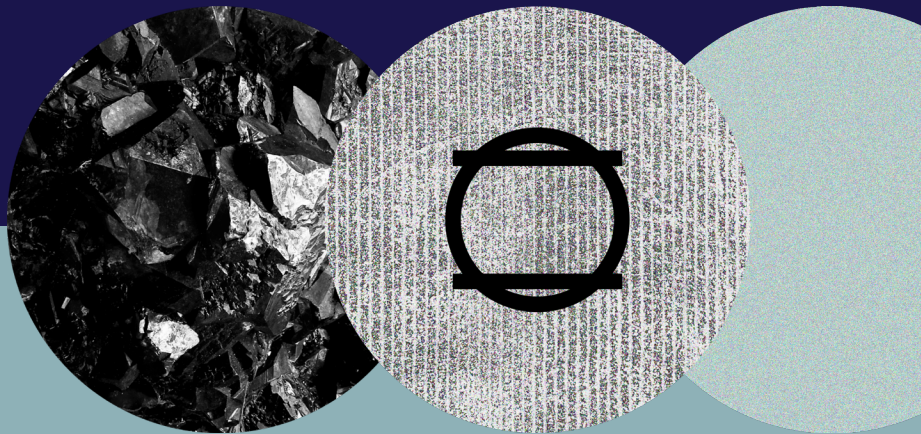


August  
2025

# Summary Report:

Workshop on the Geopolitics of Critical Minerals  
and the AI Supply Chain

---



SCIENCE, TECHNOLOGY,  
AND SOCIAL VALUES LAB  
INSTITUTE FOR ADVANCED STUDY

© Science, Technology, and Social Values Lab, 2025

**How to Cite This Report:** Carayannis, T., Kane, N., Png, M., & Nelson, A. (2025). Summary Report: Workshop on the Geopolitics of Critical Minerals and the AI Supply Chain. Science, Technology, and Social Values Lab, Institute for Advanced Study.

**Science, Technology, and Social Values Lab**

The Science, Technology, and Social Values Lab explores emerging scientific and technological phenomena and their intersections with the frustration and fulfillment of civil, political, and social citizenship. Centering a commitment to social rights, and grounded social science methodologies, the ST&SV Lab develops multidisciplinary research projects and initiatives that examine and assess scientific and technological developments and practices, and their implications for justice and democracy. Working in an anticipatory mode, the ST&SV Lab gathers extraordinary thinkers, convenes collaborations, proposes policy innovation, and encourages public deliberation.

# **SUMMARY REPORT: WORKSHOP ON THE GEOPOLITICS OF CRITICAL MINERALS AND THE AI SUPPLY CHAIN**

Tatiana Carayannis, Naima Kane, Marie–Therese Png, and Alondra Nelson

## **Introduction**

On June 3, 2025, the Science, Technology, and Social Values (STSV) Lab at the Institute for Advanced Study in Princeton, New Jersey, convened a research workshop on “The Geopolitics of Critical Minerals and the AI Supply Chain.”

The emergence of general artificial intelligence (AI) is reshaping the geopolitical landscape and reconfiguring trade flows at a critical juncture in the global economy. As AI infrastructure rapidly develops, access to the natural resources necessary to power its extensive supply chain reflects longstanding patterns in extractive sectors. Critical minerals essential for AI infrastructure—including copper, cobalt, lithium, rare earth elements, and gallium—have become focal points of resource nationalism, extractive capitalism, and geopolitical contestation. Characterized as the next “critical minerals supercycle” for the AI supply chain, this intensifying demand heightens ongoing tensions and competition between the United States and China over the mining, processing, and distribution of critical minerals.

These dynamics underscore the need to move beyond narrow accounts of technological competition to consider how AI development is materially underwritten by extractive regimes—and how Global South countries, often treated as peripheral, are in fact central to its unfolding. Broadening the analytic frame to encompass the full material base of AI supply chains also brings attention to the indispensable role of Global South countries—not only as sites of extraction but as actors with agency in shaping governance frameworks and determining the value of their resources.

Expanding this focus towards the broader web of material resources for the AI industry’s supply chain also requires appreciating the indispensable role of Global South countries in the development of AI—not only as sites of extraction but as actors with voices in governance processes and agency in determining the valuation of their materials. Despite this intensifying interconnectedness, policy frameworks and research on the AI technology stack often obscure its material underpinnings, privileging focus on compute, chips, databases, storage spaces, and clouds which enable AI models and systems. This thematic siloing has resulted in a gap between scholars studying in the development and deployment of AI systems and other emerging technologies with those studying critical minerals and natural resource ecosystems—despite the fact that these domains are tightly linked and even path dependent through geopolitical

dynamics and global supply chains on the world stage.

Building on research initiated by Alondra Nelson, Tatiana Carayannis, and Marie-Therese Png, this workshop sought to address the gap. It convened a multisector, multidisciplinary group of scholars working across AI research and critical minerals supply chain research to open new lines of inquiry into the entangled material, political, and epistemic infrastructures underpinning AI. The aim of this workshop was to support the development of new governance theories and frameworks accounting for the full breadth of the AI value chain, to build a community of research and practice at the intersection of AI and critical mineral supply chains, and to set the foundation for future research collaborations and policy recommendations.

The discussions opened with an examination of the mining sector and lessons drawn from decades of accountability efforts in that sector, reflecting both the continuities and divergences from those dynamics within the emerging AI value chain. Participants also discussed the opportunities and risks AI development pose for the Global South and concluded with recommendations for future research and policy interventions.

The workshop was preceded by a public panel titled: “RARE/EARTH: The Geopolitics of Critical Minerals and the AI Supply Chain,” which was introduced by Professor Nelson and held at the Institute for Advanced Study on Monday, June 2, 2025.

### **Lessons on Accountability from the Mining Sector**

In examining the intersections between the mining sector and AI with subject matter experts on the Democratic Republic of Congo (DRC), Argentina, and Chile, participants underscored the tensions between stakeholder strategies, geopolitical trends, and advocacy approaches across case studies. Viewing the AI industry as an extractive business model, participants noted how its supply chain blurs the line between the digital and the material, exposing the physical infrastructures and hidden dynamics that drive its rapid development. This convergence blurs the boundaries between supply chain demands, geopolitical bottlenecks, and trade pressures, as cross-sector dependencies deepen between stakeholders and across regions. The case of Argentina illustrates broader patterns observable across the Global South—where subnational governance structures, socio-environmental contestation, and global competition over critical minerals converge. Such “hinge geographies” underscore the geopolitical entanglements in AI supply chains.

Given the limited data on the specificities of the AI mineral stack, participants explored dynamics of past and current transparency, regulatory, and traceability efforts attempted within mining sectors. These insights laid the groundwork for a critical assessment of the challenges, limitations, and strategic windows of opportunity for driving accountability alongside growing AI infrastructure development.

Researchers with geographical expertise across various case study countries repeatedly remarked upon similarities in market and stakeholder dynamics in mining project developments. This was notable in highlighting the trends of risk averse approaches by Western firms, versus the asset dominance of Chinese firms. The latter have access to state-backed financing, and often acquire established mining projects, thus skipping exploration phases and offsetting risk as a consistent strategy for market entry. While not exclusive to China, this strategy is exemplified by the evolving complexity of the DRC's market landscape. This includes the emergence of new supply chain actors over time, among them both Chinese and American businesses within the same supply chains, which deviates from more front-facing diplomatic competition. That said, participants noted that one major difference between Chinese and Western investments is that Western ones have more actors (NGOs, media, courts) that pressure companies in their own countries.

These geopolitical and market dynamics unfold within a broader governance landscape. Participants underscored the abundance of national, international, and multistakeholder tools and standards—ranging from mandatory frameworks like the Dodd-Frank Act to voluntary initiatives such as the Organisation for Economic Co-operation and Development (OECD) guidelines. Yet participants noted that these governance strategies often operate in silos and can even be in tension with one another. The accountability gap, they emphasized, stems not from a lack of mechanisms but from a lack of enforcement levers—both for mining companies and for governments in how revenues are distributed.

One scholar with deep experience in the DRC's mining sector observed that many early transparency initiatives in the country's mineral supply chains have largely failed due to this enforcement gap. In a context of political instability, companies have often disregarded rights violations to maintain strategic access to minerals and other natural resources. Similar dynamics are now evident across the entire AI supply chain, where flows of minerals are directed—and at times disrupted—by the same constellation of actors and competing interests in the DRC and beyond.

A key theme throughout the discussion was the limited development of governance frameworks and actionable tools that reflect the realities of supply chains on the ground. The DRC emerged as a vivid example of how existing legal instruments—such as Section 1502 of the Dodd-Frank Act and the Critical Minerals Security Act of 2025—lack effective enforcement. Even the EU, despite its leadership on due diligence regulations, faces challenges; one participant noted that international arbitration processes often favor corporations over host states, limiting the EU's ability to enforce accountability in practice.

These tensions are further shaped by shifting geopolitical priorities. The EU, for example, has begun relaxing supply chain transparency rules to remain competitive with the US and China. Yet, one participant pointed out, unlike China, accountability efforts in the EU and US

increasingly rely on home-state legal mechanisms, such as lawsuits, civil society campaigns, and media investigations. While these have their limitations, other enforcement efforts—like the IMF’s threat to suspend a \$300 million loan to the DRC over non-disclosure of a contract—demonstrate which tools carry real weight.

Nonetheless, experts flagged concerns that many past consumer activism campaigns—such as Amnesty International’s 2016 campaign on child labor—have become detached from local realities, often isolating symptoms instead of addressing structural issues. They called for more holistic readiness assessments to support local stakeholders. Others added nuance, noting that end-use activism still plays an important discursive role and that some grassroots campaigns have shifted corporate behavior. As a way forward, one proposal emphasized building public sector capacity, technical monitoring, and enforcement mechanisms—drawing inspiration from indigenous community mobilizations and court victories in the Andean region during the 1990s.

A central takeaway from the mining industry, participants agreed, is that transparency initiatives cannot function effectively in isolation. These tools are not ends in themselves—they only work when backed by laws that reinforce voluntary principles. While certification may offer market access and some degree of disclosure, true accountability comes from below—from communities and rightsholders, not just stakeholders. Thus, centering local voices remains critical.

Participants also stressed that financing dynamics are shifting the burden of monitoring and compliance onto communities, even as the scale of disruption grows. In many contexts, there is a striking lack of actionable tools to convert traceability into meaningful accountability. The lithium sector in Argentina was cited as an example where growing Chinese investment has side-stepped key environmental licensing and consultation processes, exacerbating tensions and leaving gaps in dialogue between governments, firms, and communities. In both Argentina and the DRC, state actors were identified as enablers of non-compliance—particularly in the DRC, where research permits have been misused to bypass key regulatory steps.

Despite promises of participatory engagement, communities often find that corporate behavior remains unchanged. These implementation gaps mirror trends in global legal and trade frameworks, where communities are increasingly tasked with monitoring and compliance responsibilities, even as the scale of disruption intensifies. One participant noted that legal mechanisms—such as Investor-State Dispute Settlements—are increasingly used by corporations to override national courts and deter strategic litigation. A stark example is the \$6 billion compensation awarded in 2022 by the World Bank’s International Centre for Settlement of Investment Disputes (ICSID) tribunal against the Pakistani government, for denying a mining permit on environmental grounds. Yet not all legal developments are discouraging; Colombia’s push for a binding global treaty on traceability for critical minerals was cited by one participant as a promising step forward, though not a cure-all. Participants stressed the

need for governance frameworks that are not only participatory but also co-produced with local communities, grounded in territorial rights and decision-making authority.

Beyond specific case studies, the sessions invited further reflection on the conceptual boundaries and fundamental assumptions linking critical minerals and the expansion of the AI industry. Participants emphasized the importance of critically examining which populations are being referenced when discussing mining or the socio-environmental impacts of AI infrastructure. The discussions also questioned the criteria used to define certain minerals as “critical,” and whether meaningful scholarly analysis can rely on such classifications. Market volatility was highlighted as a key trend to monitor for shaping industry-level interventions. Some participants proposed targeting the boards of companies registered in the EU, US, Canada, and Australia as leverage points for accountability, citing examples such as the transnational advocacy efforts of the London Mining Network. Others suggested embedding ethical and responsible practices much earlier in the AI value chain, starting at the venture capital investment stage.

### **AI Supply Chain Continuities and Divergences**

The sessions examined emerging trends in AI development and sought to examine where the AI supply chains continue the extractive patterns of the mining industry, and where they diverge. Others argued that the term “AI” itself is misleading and proposed alternatives like “parasitic computation” to reflect its extractive dimensions.

Participants noted that we are witnessing the massive expansion of AI infrastructure. At the start of the discussions, one participant observed that OpenAI’s announcement of a \$500 billion infrastructure investment is just the “tip of the iceberg,” as demand grows rapidly—not only for data and computing power, but also for physical resources such as critical minerals, water, energy, and land.

At the same time, a global push is underway to develop governance frameworks that address increasingly fragmented regulatory landscapes—evident in the surge of international activity over the past year, including initiatives like the UN’s Global Digital Compact. The discussions underscored that this is a particularly critical moment for establishing effective AI governance, as AI has become a strategic asset in both economic development and geopolitical competition. The US-China rivalry in AI, once centered on research, talent, and data, is now shifting toward competition over infrastructure, energy, and critical minerals. These dynamics are unfolding alongside growing compliance challenges and persistent opacity across AI-related supply chains.

The demand for minerals used in graphic processing unit (GPU) manufacturing has soared, participants observed, driven by the short lifespan of GPUs and data centers, which often



require replacement every two to three years. The chips are incinerated because extracting minerals from them is not cost-effective, leading to a significant increase in e-waste, thus highlighting how waste and resource exploitation must be viewed as integral parts of the AI supply chain.

Driving much of this demand are what one participant called the “imaginaries” of technological futures—visions of what AI innovation and entrepreneurship should look like. These narratives, often advanced by tech leaders, filter into global institutions like the IMF and the UN, shaping policy and funding priorities. AI futures are presented as inevitable and urgent, leading to anxiety among governments and the fear of being left behind. One participant critically noted that some of these concepts, like Artificial General Intelligence (AGI), are speculative, yet used to stoke existential fears—for example, that if China achieves AGI first, it will pose a global threat.

The concept of “weaponized temporality” emerged as a central theme—where urgency narratives, often driven by elite tech networks and media, create a sense of inevitability and obscure the extractive realities behind AI infrastructure. This framing drew attention to the inadequacies of siloed approaches to AI governance, particularly where trade, human rights, environmental protection, and cybersecurity intersect. Participants discussed the difficulty of building coalitions across these domains, with examples drawn from Malaysia’s experience with data extraction.

The sessions revealed that efforts to improve transparency and traceability in AI supply chains face major barriers, particularly due to secrecy laws protecting AI models. Transparency alone, participants argued, is insufficient, especially as AI regulation is rolled back even as mineral and energy consumption accelerates. The public bears the costs of infrastructure created by private industry, with little accountability.

Researchers suggested that what is driving much of this infrastructure growth is speculation, or at least the narrative power of the speculative. This speculative logic is increasingly used to justify regulatory “states of exception,” as seen in Virginia, where policymakers lack clear benchmarks for AI’s energy needs. This signals a deeper entanglement between AI imaginaries and energy imaginaries, with little clarity on what level of energy use is appropriate or necessary. Participants noted that even the IAEA’s energy forecasting does not currently account for AI as a major energy consumer. Yet the scale and type of mineral demand vary widely depending on how AI is defined. As one participant observed, AI for the public interest may require different minerals than AI for profit-driven enterprise—underscoring the need to differentiate between types of AI development when assessing resource impacts.

Participants broadly agreed that the mineral supply chains supporting AI both replicate and reconfigure traditional patterns of extraction. While echoing the familiar logics of extractive industries, AI supply chains introduce new forms of infrastructure, actors, and tensions—rooted



in market competition, geopolitical rivalries, and securitization. One participant noted that, unlike conventional mineral supply chains, policy documents such as the African Union’s 2023 Continental Strategy on AI represent a significant shift: for the first time, ownership of raw materials is explicitly linked to national conditions for sustainable digital development, placing extraction within a broader digital governance agenda. Although this is a promising first step, additional global governance initiatives remain key to expanding diplomatic platforms in this domain and strengthening the negotiation capacity of Africa, Latin America, and Southeast Asia, thus ensuring a more inclusive governance process that reflects the priorities and contexts of the global majority.

AI-related supply chains also require significantly larger volumes of critical minerals, land, water, and energy to support their rapid scaling. Simultaneously, they depend on more complex and layered infrastructure, blurring the usual distinctions between extraction and manufacturing stages.

Several participants emphasized that one of the key continuities between AI and traditional extraction sectors is the persistent lack of effective governance tools capable of holding companies and governments accountable. This continuity served as a foundation for deeper discussion on how AI and mineral supply chains jointly expose the inadequacies of dominant development paradigms—particularly those that offload ecological, labor, and health burdens onto local communities. Some of the accountability challenges visible in the lithium sector—such as fragmented regulatory frameworks, water governance opacity, and consultation failures—offer concrete precedents that may inform debates on AI infrastructure, especially in contexts where energy, land, and mineral governance intersect.

One contribution reframed this overlap by highlighting how AI is also actively reshaping labor dynamics within mineral supply chains. Through increasing automation of sector-specific tasks, AI is accelerating job displacement and transforming workforce structures. Another intervention challenged the notion that governments in the Global South will only engage with AI’s extractive consequences. Instead, it argued that elite politics, strategic interests, and the pursuit of perceived benefits will also shape engagement with AI.

This provocation opened up space for more critical reflection on how resource-producing countries should position themselves in the global AI debate, and how they might pursue stronger international coordination at the intersection of regulation, development, and activism.

### **Risks and Opportunities for the Global South**

Discussions in this session highlighted the complex trade-offs facing Global South countries in the emerging global AI economy. On one hand, rising demand for critical minerals and energy offers opportunities for increased electrification, improved connectivity, and new

revenue streams for resource-producing nations. On the other, the rapid pace and scale of AI infrastructure development often outpace thoughtful consideration of its social, political, and environmental costs. Participants called for more systematic analyses of who benefits from these changes, whether interests are mutual or extractive, who defines these terms, and how these trade-offs can be made more visible. The discussion underscored the clear need for holistic risk-benefit assessments and critical scrutiny of the narratives shaping AI-related development.

Across sessions, risks and opportunities were deeply intertwined, particularly in efforts to reframe the Global South's role in value creation and distribution across AI-related supply chains. Discussions about AI infrastructure including semiconductors and data centers, elicited widespread concern among participants about the intensifying extractive pressures on land, labor, energy, and water.

A participant with experience mapping AI infrastructure in Mexico noted the increasing sophistication of tin and lithium refining to support the development of AI and the energy-intensive processes required for GPU manufacturing. They also shared firsthand accounts of community resistance to governments prioritizing corporate water access over basic needs. Similar tensions were observed in Taiwan, where the campaign slogan “industry drinks good water while the people drink wastewater” encapsulates public backlash, and in Latin America, where protests with the slogan “No es sequía, es saqueo” (“It’s not drought, it’s plunder”) echo the same sentiment.

Labor concerns also surfaced prominently. Participants cited the exploitative treatment of Southeast Asian migrant workers in Taiwan’s semiconductor sector, including industrial accidents that have raised ethical concerns. They also discussed comparable risks tied to labor precarity and water stress in the Malaysian state of Johor, which is becoming a regional data center hub.

Notably, some participants questioned whether the harms now attributed to AI are in fact unique. They argued that land rights violations, labor exploitation, and resource extraction long predate AI and would likely persist even if AI development slowed. However, they also emphasized that failing to engage with the expansion of AI could mean missing strategic opportunities to influence policy on natural resource pricing and market participation. One participant asked how critiques of extractive practices might shift if the same mineral resources were used to build regionally integrated tech ecosystems in Africa or Latin America.

While the geography and timelines of data center development are highly context-dependent, trade-offs are often dictated by industry lobbying and short-term planning imperatives. Participants stressed the importance of developing local governance models to counter externally imposed priorities, timelines, and narratives. From Chile to the DRC, and Malaysia

to Taiwan, communities face shared risks related to environmental harm, labor exploitation, and uneven value distribution. In response, the discussions underscored the importance of advancing transnational research collaborations, fostering regionally grounded frameworks for cooperation, and investing in institutional capacity to address these intersecting challenges.

Participants identified opportunity areas for intervention, including drawing lessons from the EV battery movement, particularly efforts to localize supply chains and leverage mineral resources for broader development goals such as skills training and technology transfer. As one participant noted, the challenge lies not only in critiquing past failures—such as the lack of progress in the DRC over the past two decades—but in reframing development narratives around specific, tangible issues such as water access and labor conditions.

Norway’s success in avoiding the resource curse was cited as a model, achieved in part through deliberate efforts to slow down decision-making. In this context, “slowing down” was proposed as a strategy for paradigm change, for allowing time to reassess what constitutes value and development. While there may be benefits to AI expansion—connectivity, electrification, data sovereignty, and new revenue streams—the risks remain significant: environmental degradation, energy diverted from communities to industry, and deepening dependency on Global North economies. Yet the current speed of transformation often leaves little room for meaningful public debate of these trade-offs.

Why should the Global South care about AI and data centers? Because the scale and speed of change are unprecedented, the wealth generation associated with AI threatens to further widen global inequalities. Resource-producing countries must recognize that their natural assets remain underpriced, even as AI companies rank among the world’s wealthiest. To respond effectively, researchers and policymakers require improved access to economic data, enhanced market analysis, and strategic planning for the use of critical minerals. This includes investing in shared infrastructure to support economic diversification once the current AI boom subsides. One participant noted that moral imperatives drove the push for clean supply chains during the green energy transition. A similar framework could be applied to AI.

Several participants stressed that Global South countries only begin to gain real leverage in the supply chain when they move beyond upstream activities like extraction and into midstream processes such as refining and processing. At this stage, states can exercise greater controls, for instance, by imposing price premiums on minerals used in military applications opposed to those used for public goods. However, others pointed out that generative AI’s general-purpose nature complicates such distinctions, potentially making market segmentation and differentiated pricing more difficult to enforce.

Finally, participants emphasized that the Global South’s role in the AI ecosystem extends far beyond mineral extraction. A substantial portion of technical and data-related tasks—

such as data labeling, cleaning, and experimentation—is carried out in the Global South, yet the benefits and control over this work often shift to the Global North, reinforcing existing dependencies. Despite these challenges, participants recognized the current moment as a strategic opportunity for the Global South to reshape development trajectories on their own terms.

### **A Research Agenda for the Future: AI, Extraction, and the Global South**

Discussions throughout the workshop highlighted the pressing need for a new research agenda to better understand and govern the expanding intersection between AI, mineral extraction, and the Global South. Participants underscored that addressing these issues requires collaborative, interdisciplinary, and multisectoral approaches that bridge conceptual and empirical gaps in current global AI policy conversations.

A key theme was the need to move beyond dominant, industry-driven narratives. Participants called for the development of counter-narratives that are more reflective of the realities and priorities of Global South communities. For example, there was strong interest in generating evidence to challenge common assumptions—such as the notion that resource-for-technology exchanges are inherently beneficial, or that off-the-shelf AI solutions are universally applicable. Participants emphasized the importance of centering context-specific needs and capacities, particularly within African, Latin American, and Asian entrepreneurial and industrial ecosystems.

Several concrete research pathways were proposed. These include the creation of data center observatories, support for investigative journalism, and mechanisms for translating community-collected data into actionable materials for litigation and policy. Community toolkits were identified as vital tools to initiate local-level discussions around trade-offs—particularly at the interface of environmental degradation, infrastructure development, and extractive industries.

Participants also stressed the need for expanded research into AI's e-waste supply chains, particularly the recycling and lifecycle management of critical hardware components like GPUs, given that the incineration of short-lived GPUs in countries such as Kenya, Ghana, and China was cited as a recurring issue. This led to broader calls for mapping critical materials used in AI infrastructure—such as copper in data centers, cobalt in energy infrastructure, and tantalum in GPUs—as well as understanding how demand for these minerals may evolve amid market shocks and technological shifts.

In the realm of theory, participants encouraged deeper engagement with disciplines such as political ecology, economic anthropology, critical geography, and legal theory, particularly in relation to conflict and securitization. Historical analysis also emerged as a priority, particularly the need to examine continuities between contemporary extraction and colonial-era resource

dependencies. Some participants proposed comparative research to explore parallels between the deregulation era of the 1970s and 1980s that marked a global ideological shift toward market liberalization and today's regulatory rollbacks and economic nationalism under the US Trump administration.

### Future Areas for Inquiry

In addition to the core research directions outlined above, participants noted further areas for inquiry that merit sustained attention. These include questions around the territorial impacts of AI infrastructure, the labor and financial regimes that sustain it, and the legal and epistemic frameworks through which its governance is negotiated. New research should also explore how extractive dynamics are embedded in the digital supply chain—from mineral inputs to data annotation—and how knowledge production, particularly in the Global South, can be better resourced and recognized in shaping governance models. Several key questions were raised, forming the basis for a forward-looking research agenda:

#### Digital Sovereignty

- Whose knowledge counts in shaping the governance of AI and minerals? How can Indigenous, Afro-descendant, or other epistemologies be included in standard-setting processes?
- How are academic institutions in the Global South positioned within emerging research networks on AI and extraction, and what barriers to participation persist?
- How can and should "data sovereignty" be conceptualized and contested in relation to the global data brokerage industry, and what implications does this have for regulatory frameworks and self-determination in the Global South? How can communities define and represent themselves within global data systems?

#### Legal and Rights Frameworks

- How can human rights, environmental justice, and Indigenous land rights frameworks be applied to AI governance?
- What legal innovations (e.g., ecocide, rights of nature) could be extended to the AI-extractive nexus?
- How should the mutual benefit of the AI supply chain be defined, and by whom? Can benefits be understood beyond the narrow lens of cost-risk assessment?

### Supply Chain Transparency and Governance Innovation

- How can resource-rich Global South countries strategically leverage their role in critical mineral supply chains to influence global AI governance and industrial policy, particularly amid growing dependencies from the EU, US, and China?
- What tools, frameworks, or institutions could improve the traceability and accountability of AI mineral and data supply chains?
- How do supply chain certification regimes operate in AI-related industries, and what are their geopolitical and ethical implications?

### Infrastructure, Labor, and Land

- How do the spatial demands of AI infrastructure—such as land, power, and cooling—intersect with land tenure regimes and Indigenous or rural displacement?
- What forms of invisible or distributed labor (e.g., content moderation, data annotation) are concentrated in Global South regions, and how can these be more effectively documented and governed?
- What territorial claims are being made (or remade) through the placement of data centers, fiber optic routes, and energy corridors?

### Militarization and Strategic Resource Competition

- How does the strategic use of AI in defense and surveillance reinforce resource-driven foreign policy in mineral-rich states?
- What are the implications of dual-use technologies for mineral diplomacy and security?

Participants also proposed exploring the role of AI in reshaping traditional mineral supply chains, and how this might influence the emergence of a new development paradigm. Some framed this moment as an opportunity to rethink longstanding international development models, particularly in the wake of growing skepticism around development institutions like USAID and the broader crisis of multilateralism. This moment, they suggested, offers fertile ground for revisiting foundational frameworks in dependency theory, modernization theory, and international relations.

Participants called for new data to better understand the environmental impact of AI infrastructure, including energy use and water consumption. The case of Lleida, Spain—

cited as the first city council to ban data centers over resource concerns—was presented as a pivotal example. It followed similar moratoriums in Dublin and Singapore, which pushed development into countries like Malaysia. These examples highlight the importance of localized environmental and infrastructure data to inform policy decisions.

The conversations concluded with a collective recognition that many of these questions are deeply interconnected. Addressing them will require breaking down research siloes – not only across issue areas such as environmental justice, digital governance, economic development, peace and security, and human rights, but also among traditional academic fields including political science, economics, law, sociology, anthropology, and geography. Participants emphasized the need for greater international research, coordination, and collective action to address these critical issues.

## Workshop Participants

Seyram Avle, University of Massachusetts-Amherst  
 Lauren Bridges, University of Virginia  
 Elisabeth Caesens, Resource Matters  
 Andrea Calderaro, Cardiff University and European Union Institute for Security Studies  
 Tatiana Carayannis, Institute for Advanced Study  
 Kate Crawford, University of Southern California and Microsoft Research  
 Genevieve Ennis Hume, Implikit  
 Howard French, Columbia University  
 Juliana Gonzalez Jauregui, Latin American Faculty of Social Sciences-Argentina  
 Brian Hioe, Taiwan Research Hub, University of Nottingham  
 Naima Kane, Institute for Advanced Study  
 Michael J. Kavanagh, Bloomberg News  
 Tamara Kneese, Data & Society  
 Christian-Géraud Neema, China-Global South Project  
 Alondra Nelson, Institute for Advanced Study  
 Marie Therese Png, Institute for Advanced Study  
 Thea Riofrancos, Providence College and Climate and Community Institute  
 Peter Rosenblum, Bard College  
 Cristian Trujillo, Resource Matters  
 Ana Valdivia, University of Oxford  
 Christoph Vogel, Ghent University  
 Chee Yoke Ling, Third World Network  
 Erica Westenberg, Natural Resource Governance Institute

*This workshop was generously supported by the IAS Jonathan M. Nelson Center for Collaborative Research, the Heising-Simons Foundation, and the Ford Foundation.*