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INTERNATIONAL RELATIONS

CHALLENGES IN THE US-AFRICA CRITICAL MINERAL COOPERATION

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ABSTRACT

The study examines the barriers in US-Africa Critical mineral cooperation, including the competition to control the critical mineral supply chain. It focuses on the factors that influence cooperation and the mining process in Africa, identifying the barriers and the best approach for the United States to tilt the competition in its favor and foster cooperation. A qualitative research design was employed, using purposive and random sampling techniques to select 14 participants representing U.S. government agencies, U.S. companies in the mineral sector, and local and international non-governmental organizations. Data were collected via semi-structured interviews and analyzed using thematic and content analysis. The findings revealed significant challenges, including transparency issues, poor coordination, environmental gaps, and infrastructure gaps, in the region. The case studies of the Democratic Republic of Congo (DRC), governance and SA, and Angola's rare earth resources revealed comparative differences in governance approaches and structures among the three countries. Angola and South Africa (SA) demonstrate stronger governance structures and are ready to partner with the United States in critical mineral areas, while the DRC continues to face governance constraints. The results suggest that the United States can pursue cooperation with African nations by adopting differentiated strategies tailored to national contexts, thereby enhancing trust, improving governance collaboration, and strengthening its position in the global critical minerals competition.

***Keywords**: Critical minerals; Cooperation; Governance; Transparency; Infrastructure; Mining.*

1.0. Introduction

The demand for critical minerals has increased substantially, driven by the accelerated transition towards low-carbon technologies and cleaner energy sources, including energy storage, electric vehicles, and renewable power generation (Calderon et al., 2024; Watari et al., 2019). So far, approximately 200 national policies and strategies on critical minerals are required for the transition to a low-carbon global economy (International Energy Agency, 2025). The International Energy Agency's (IEA) 2023 Critical Minerals Market Review indicated that demand for nickel rose by 40%, lithium tripled, and cobalt increased by 70% between 2017 and 2022 (International Energy Agency, 2023). Similarly, the demand for critical minerals for renewable and industrial use has doubled over the last five years, reaching USD 320 billion in 2022 (International Energy Agency, 2025). It is projected that demand will be more than double by 2030 and quadruple by the end of 2050, reaching an annual revenue of USD 400 billion (International Energy Agency, 2025; Holechek et al., 2022). The United States is facing challenges in securing these minerals for its industrial use. It is forced to depend on its competitor, China, for the supply of rare earths and cobalt, thereby risking its national security (Chapman, B., 2018; Salim et al., 2022). The dynamics are compelling the United States to reduce its dependency on China and explore alternative cooperation with resource-rich nations in Africa, providing an opportunity to extract and process minerals.

Current literature indicates that China has a competitive edge over the United States in the race to acquire and process critical minerals in Africa (Kumar & Vishwanathan, 2025; Picarsic & de La Bruyère, 2025; Merem et al., 2021). (Kitili, 2024; Spinner, 2021) argue that over the last 20 years, China has invested heavily in Africa's infrastructure, creating partnerships and empowering African communities, thereby earning trust and recognition as a true partner. This has enabled it to develop a viable trend for mineral acquisition and processing in many resource-rich African nations. However, African nations, such as the Democratic Republic of the Congo (DRC), Zambia, Zimbabwe, South Africa, and Angola, possess strategic critical mineral reserves that can provide the United States with much-needed alternatives and power its technological industries.

Despite significant competition from China, Europe, and other nations, strategic cooperation with mineral-rich African nations can provide the US with a space to mine and process critical minerals, as well as secure its supply chain (Akubueze, 2025; Raju, 2020; Su & Hu, 2022; Kumar & Vishwanathan, 2025). Therefore, a change in approach, ethical practice, and sustainability, along with improved governance, is necessary to create an alliance between the U.S. and African nations that achieves meaningful gains. For instance, strategies such as advancing local mineral processing, leveraging the Victoria Falls Stock Exchange (VFEX)(Chizengeni & Prentice, 2025; Kitili, 2024; Salim et al., 2022), and supporting infrastructure development can unlock the economic potential of Zimbabwe and other African nations, positioning the U.S. to collaborate with Africa more sustainably and profoundly than China has to date.

Although the partnership between the US and African nations in critical minerals is said to be strategically viable and relevant, the general lack of proper cohesive categories of threats, which include issues of US policy towards African nations, governance, infrastructure, and competition from China, has made it impossible to form a better partnership, since these issues have not been resolved yet. This research was conducted to gain a more comprehensive understanding of the issues currently hindering practical cooperation between the US and African nations in critical minerals areas and to establish the most beneficial solution. According to a study by Dibbern et

al. (2024), most current studies do not address the specific challenges or barriers. However, they present an integrated review that summarizes obstacles and investigates their interdependencies, especially in light of realities on the ground and beyond the policy debate in high–level discourse. Therefore, this requires a higher analysis.

The question that lies at the base of an investigation on the challenges of U.S.-Africa cooperation in critical minerals: How can the United States develop a meaningful, mutually beneficial strategic relationship with the African countries, including the Democratic Republic of Congo, Tanzania, Zimbabwe, and Zambia, concerning the critical minerals supply chain and become less reliant on China? This study aims to bridge the knowledge gap on how to form reality tests, such as partnerships, to develop a specific action plan that can lead to economic growth in African countries, while also ensuring the U.S. can meet its critical minerals needs. It does not focus solely on opportunities but also delves into the depths to offer practical ways to attain success in this critical field. The overarching aim of the current research is to examine in detail the multifaceted issues that impede successful, mutually beneficial cooperation on critical minerals between the United States and the African region, and to outline major areas where the US should intervene in its policies and expand its strategic reach.

2.0. Theoretical Framework for the Study

This study employed multiple theoretical perspectives to investigate the complex and multi-layered challenges to practical cooperation between the United States and African nations in the field of critical minerals. The selected frameworks, including dependency, political ecology, institutionalism, and realism, provided complementary lenses for a more comprehensive investigation of the structural, political, economic, and environmental factors that shape US–Africa engagement. The theories shed light on different aspects of the partnership world: the dependency provided the historical and economic differences, political ecology theory offered implications that are experienced by the environment and socio-political context due to resource exploitation, the institutionalism theory looked into the decisions that are made in a specific direction as regards to the governance processes as well as the policy orientations, and lastly, on the importance of the ability to exploit resources, the reality which is the mode of how supposedly global actors deal with one another in terms of interest and power. The use of multiple frameworks is methodologically appropriate, as it helps mitigate the shortcomings of single-theory studies and enables a more comprehensive understanding of the interactions among power relations, governance mechanisms, environmental effects, and economic reliance. The combination of these views provides a robust foundation for assessing the role of global powers in the African mineral sector, as well as the impact of institutional governance, economic sovereignty, environmental sustainability, and geopolitical positioning.

2.1. Dependency Theory

The concept of dependency theory posits that the underdevelopment of certain countries is a direct consequence of their exploitation by wealthy, developed nations (Kvangraven, 2021). According to the theory, which was established in the early 1950s by scholars from Latin America, Africa, and Asia, it critiques the assumptions of modernization theory (Ahumada et al., Gessi, 2024; Katz, 2022). Modernization theory hypothesizes that poor nations are impoverished due to their lack of social, economic, and cultural progress; consequently, resources flow from the

periphery of poor and developing nations to the core of wealthy countries, enriching the latter at the expense of the former (Nwafor et al., 2023). African, Latin, and Asian scholars have presented a compelling argument that the global economy is structured in favor of wealthy, industrialized countries at the expense of resource–rich and developing nations (Attoh & Uzomah, 2024; Nwafor et al., 2023; Tukon, 2024). The dependency theory, therefore, highlights how historical trends of economic exploitation and colonization have led to the systematic perpetuation of inequalities.

The mineral-rich African countries primarily serve as suppliers of minerals to industries in developed countries. Mavhunga (2023), Signé, and Johnson (2021) highlighted that most African countries lack companies that provide value addition to their minerals. Across the entire continent of Africa, there are no electric cars or electronic manufacturing plants, despite the continent being rich in rare-earth minerals, cobalt, and lithium, essential components for their manufacture. This happens despite numerous promises by the developed nations to offer mutual benefits to the mineral-rich African nations. Thus, it leaves African nations with little choice but to rely on foreign technology, capital, and markets, which undermines their long-term economic sovereignty.

2.2. Political Ecology

The political ecology collaborates ecological issues with social justice and political economy. The theory has origins in various disciplines and is characterized by diverse theoretical approaches, with natural selection as a fundamental concept (Bouzarovski, 2022). Inequalities, injustices, and environmental degradation have plagued African nations for decades. The exploration of minerals in Africa has significant impacts on the community, due to environmental issues and political instability. The resource extraction is deeply associated with inequality, power relations, and socio-political conflict. Hanai (2021), Majambu et al. (2021), and Schibli (2025) argued that civil war or conflict in the Democratic Republic of Congo (DRC) would never end unless mining issues are addressed through policy initiatives.

The extraction of minerals resulted in the displacement of communities, violation of human rights, and environmental degradation in DRC, Tanzania, Zambia, and other mineral-rich countries. Conflict minerals lie at the heart of instability in the DRC (Hanai, 2021; Tshinu, G. M., 2022; Kabulo et al., 2023). The exploitation of tantalum, tin, gold, tungsten, and other minerals continues to fuel the corruption of national governments, brutal armed militias, and greedy corporations (Quirke, 2022; Rapanyane, 2022; Dasilva, 2022). The natural resources have caused the most serious humanitarian problems in the DRC, primarily for the benefit of international corporations mining critical minerals. The United Nations report on the refugee crisis estimated that approximately 290,000 people were displaced between December 2035 and early February 2025, with more than 102,000 displaced within a week (Ngabu et al., 2024; Vincent & Mgaya, 2022; Citaristi, 2022; Phiri et al., 2024).

A study by the World Bank found that the DRC is one of the poorest countries in the world, despite its rich mineral and other natural resources (Lipekene et al., 2023; MN & Mahesh, 2024; Nteranya, 2024). This, therefore, challenges the assumption that mineral resource extraction in Africa automatically benefits host countries. It emphasizes the need to establish an inclusive environmental justice governance framework that can ensure the mineral resources benefit the African nations. However, the U.S.-Africa cooperation should be based on mutual benefit, shared responsibilities, and respect for sovereignty. This would require the United States to shift away

from its traditional aid approach toward a more equitable collaboration that prioritizes sustainable economic and infrastructure development and social justice.

2.3. Realism

Realism emphasizes the power dynamics that shape countries' behavior as they pursue their national interests (Sheik, 2023; Schmidt & Juneau, 2024). The high global demand for critical minerals has created high competition among the superpowers, especially the United States and China. The competition, if not handled correctly, can create tension in Africa, thereby complicating US-Africa cooperation on critical minerals. Most nations typically prioritize their national security; therefore, the United States prioritizes both its economic interests and national security in seeking to diversify its supply chain of critical minerals away from China (Zhe et al., 2025; Müller, 2023; Müller, 2025). On the other hand, African nations have their own priorities that may not align well with the United States' objectives. This is more likely to impact cooperation between the US and Africa negatively.

The historical collaboration and power disparity between African countries and the United States is based on post–colonial and colonialism dynamics. It makes it challenging to achieve equitable negotiations and agreements in the pursuit of critical minerals in the region. African nations need to shape their development path without depending on other nations. The United States, China, and other nations competing for critical minerals in Africa have national interests to secure (Kumar & Vishwanathan, 2025; Ufimtseva et al., 2024; Vivoda et al., 2024); therefore, other interests cannot supersede these national interests. Realism acknowledges power imbalances and recommends that the United States be mindful of its influence in the region and refrain from any action that could be perceived as neo-colonial or exploitative by the people.

2.4. Institutionalism

Institutionalism highlights the role of laws, norms, and governance in shaping cooperation between nations and explains the source of the challenges the US-Africa partnership faces (Roger et al., 2023; Mayer, 2023; Schotter et al., 2021). The current institutions in the United States and Africa lack the power dynamics necessary to ensure that cooperation is mutually beneficial. This, therefore, results in unequal power distribution, difficulties in obtaining sustainable and equitable outcomes, and a lack of transparency. The existing agreements between the United States and African countries, such as AGOA and AfCFTA, are not well placed to address the challenges of US-Africa critical mineral cooperation (Roger et al., 2023). Most problems raised by African leaders have not been resolved, and continued disregard for them negatively impacts progress towards cooperation in critical mineral areas. Adebayo and Werker (2021); Nwangwu (2025); Sharman (2022) highlighted that some of the critical issues raised and supposed to be addressed in bilateral agreements are sustainable mining practices, fair distribution of benefits, and technology transfer; however, these issues remain unresolved, making the US-Africa critical mineral cooperation a problem.

There is a power asymmetry in the US-Africa relationship, which directly affects bilateral agreements and any form of cooperation. The United States holds a strong political and economic position when negotiating with African nations. It affects negotiation outcomes, including terms of agreement on mineral extraction and processing, fair prices, and technology transfer. Mayer (2023), Roger et al. (2023), and Schotter et al. (2021) argued that, in agreements, most African nations are often on the receiving end and accept the terms provided without questioning many

details. This left many issues unresolved, leading to unfair prices, struggles to attain them, environmental issues remaining unaddressed, and poor labor conditions. Besides the high competition between China and the United States for the minerals, African nations remain pawns in the game. African nations lack effective institutions capable of negotiating with the United States, China, and other developed nations to secure the best prices and agreements that benefit both parties (Schotter et al., 2021). This, therefore, undermines the process of US-Africa cooperation in critical mineral areas. African leaders and the people often treat every agreement with suspicion. They are reluctant to make some of these agreements public due to a lack of trust in their institutions and fear of public backlash.

Table 1: Summary of the Theories

Theory	Focus Area	Key Concepts	Relevance to US-Africa Critical Minerals Cooperation
Dependency Theory	Global economic inequality	Core-periphery, exploitation, and neocolonialism	Africa as a resource supplier, the U.S. as the industrial core, and structural inequality.
Institutionalism	Role of institutions and rules	Path dependence, governance, transaction costs	Explains weak regulation, transparency, and investment barriers.
Realism	National interest in an anarchic world system	Power, security, self-interest	U.S. strategic interest in minerals and geopolitical positioning.
Political Ecology	Environment, politics, inequality	Resource conflict, environmental justice	Extractive projects in Africa lead to environmental harm and social displacement.

3.0. Methodology

3.1. Research Design

This study employed a qualitative research design as an analysis approach. Oranga & Matere (2023), Muzari et al. (2022), and Stapley et al. (2022) stated that a qualitative research design provides in-depth insight into a phenomenon or reality. A study by Alhazmi & Kaufmann (2022) and Lösch et al. (2023) highlighted that qualitative research is an exploratory approach that seeks to provide a detailed explanation of how and why a social phenomenon operates as it does in a context. This study focuses on investigating the challenges the US faces in cooperating with African countries in critical minerals areas. The study employed a qualitative rather than a quantitative method due to its empirical nature (Alhazmi & Kaufmann, 2022). This is because a more rigorous research design was required to obtain detailed context, given the nature of the study. The qualitative method guided this study in providing a more effective and adequate response to the research questions.

3.2. Participants and Sampling

The key targeted population for the study consisted of representatives from fourteen organizations working in critical minerals areas in Sub-Saharan Africa and with the US government agencies, either directly or indirectly. However, two participants were representatives of U.S. government institutions or agencies; three represented organizations affiliated with critical mineral companies operating in Sub-Saharan Africa; six represented African-based NGOs; and labor unions, directly or indirectly, associated with organizations operating in critical mineral fields and with U.S. actors. The three representatives were from international NGOs working with companies, as well as from locally based NGOs in areas or countries where critical minerals are mined. Therefore, a total of fourteen (14) participants from fourteen organizations were interviewed. The participants represented a diverse cross-section of stakeholders involved in critical minerals in Sub-Saharan African countries, including private-sector actors, U.S. government agencies, Sub-Saharan African Civil Society Organizations, labor organizations, and international non-governmental organizations. Table 1 below illustrates a detailed study of the targeted population.

Table 2: Study Target Population

No	Organizations	Representatives and Organizations
01	US Government Agencies	2
02	Critical Minerals Project US Company	3
03	African NGO Representatives:	6
04	International NGO Representatives	2
Total		**14**

This study employed a purposive sampling strategy to identify and select key organizations and informants directly or indirectly involved in critical mineral projects, policy, development, and advocacy across Sub-Saharan Africa and the United States. Purposive sampling, according to Makwana et al. (2023), is a nonprobability sampling method in which researchers intentionally select participants based on specific characteristics relevant to the study. The sampling technique considered the required attributes and was therefore appropriate for this study, as the participants were willing to participate in the research process.

Moreover, the study employed a combination of purposive and random sampling to select organizations that were both necessary and representative, thereby providing a deep understanding of the study areas. Random sampling is the process of selecting participants from a population; therefore, identified organizations were allowed to select a representative for an interview. In this case, an organization was approached via email, followed by a phone call to participate in the study. Once the content and purpose of the study were agreed upon, an organization selected one individual or representative to be interviewed, and the research questions and questionnaire forms were shared with the interviewee in advance.

3.3. Data Collection

The data for this study were collected from both primary and secondary sources. The primary data were collected through semi-structured interviews completed between July 20 and August 5, 2025. The fourteenth set of purposely selected organizations represents the US government Agencies, a US company involved in critical mineral projects, African NGO representatives, and International NGO representatives. The semi-structured interview was used to gather in-depth information from participants, understand their experiences, and obtain insights and perspectives on critical minerals, community effects, governance, and international cooperation.

The interviews were conducted by phone due to participants' geographic locations, and the selected representatives had a 45-minute interview. The interview process was guided by an interview protocol that consisted of open-ended questions shared with the interviewees prior to the interview. Each question was carefully crafted to align with the research objectives and goals. The questionnaire covered several studies, including labor rights, policy and regulatory frameworks, partnerships in the critical minerals field, stakeholder engagement, environmental concerns, and investment trends in the critical minerals sector. The interviewees' responses were written on the questionnaire forms. For each set of questions, feedback was recorded for each section to ensure that every concept was effectively captured. The participants did not permit recording of the interview process, and consent was limited to writing down responses based on the earlier shared questionnaire forms. The responses from the questionnaires were therefore analyzed to answer the research questions.

The secondary data were obtained from articles and peer-reviewed studies from previous research. The data were acquired from the internet search using Google Scholar, Sabinet, government and institutional websites, JSTOR, and Academic Search Premier. The search was conducted using keywords related to the research topic, including "challenges of US-African critical minerals," "critical minerals," "partnership," and "US-Africa partnership." This intensive search aimed to gather relevant information on the challenges of US-African cooperation regarding critical minerals.

Ethical considerations were taken into account during the interview, and each participant provided informed consent before enrollment in the study. They received the research title, its purpose or objectives, and the questionnaire forms and questions before the interview. The information sheets were also shared with all participants, highlighting the confidentiality measures and each participant's right to withdraw from the study at any time. To ensure confidentiality and anonymity, participants are not to be referred to by their real names, but only by the organizations they represented, unless prior permission is granted.

3.4. Data Analysis

This study employed content analysis to obtain detailed insights into the collected interview data. According to Makwana et al. (2023), content analysis is a qualitative data analysis approach in which data are analyzed based on the intentions expressed in passages or texts, along with their contexts. Stapley et al. (2022) argued that the content analysis approach aims to provide knowledge and understanding of the detailed phenomenon under study. According to Makwana et al. (2023), content analysis provides opportunities to effectively analyze the manifest and descriptive content, resulting in categories, as well as interpretative and latent content, which

generates themes. The study divided the data source into ten different themes: transparency, corruption and contract disclosure issues, Fragmented coordination among multiple agencies and regional bodies, Competition from China, Infrastructure and Investment Gaps, environmental and social concerns, and US-Africa mineral cooperation Strategies based on the contents of the feedback from the participants and related to the research questions and objectives.

Coding was performed, and each participant was assigned a unique identifier, ranging from P1 to P14. The coding included the sector and categories as illustrated in Appendix 1A, Table 1A. For efficient analysis of the content, each participant's code was aligned with the central theme and subthemes. The theme number was included for easier understanding and tracking of the process, as shown in Appendix 2, Table 2a. The analysis proceeded further to identify each quote from the data presented by all fourteen participants. Relevant themes and subthemes were then identified for efficient presentation in the findings, as shown in Appendix 3, Table 3. Content analysis was used to develop the critical analysis, and the findings were presented using participant codes [P1 to P14]. The quotes for each participant are presented in Appendix 1B, Table 1 B. However, the quote matrix was used to identify the relationships among the theme, subtheme, and participant code, as shown in Appendix 3, Table 3a. This analysis was conducted using research questions developed in accordance with the research objectives and based on participants' feedback, as indicated in the questionnaire forms in Appendix 4, Table 4.

3.5. Limitations of the study

The research analysis followed the developments in the US–Africa critical minerals and partnership areas. An analysis of the challenges to the US-African critical mineral partnership was conducted within a specific period, concluding on August 12, 2025. Regional

developments after the analysis are omitted in the research owing to the submission deadline and the focus area of the study. Developments in the US-China geopolitical contest in African countries, as well as the dynamics of US-Africa cooperation after the analysis date, are excluded from the study. The study focuses on specific African countries, examining the motivations for the African continental partnership that derive from discussions of US-led and China-led partnerships.

4.0. Findings

4.1. Transparency, corruption, and contract disclosure issues

The findings indicate that transparency, corruption, and contract disclosure are key factors in the foundation of the challenges in U.S.-Africa critical mineral cooperation. They appeared prominently in several quotes as issues hindering US-Africa cooperation in the critical minerals field. Most participants described the contract negotiation as opaque, and political leaders are bribed to undermine the national interest. [P13, Global Transparency NGO] noted, “contracts are negotiated in secret and kept confidential, hence marginalizing labor stakeholders and the local communities.” The statement was also echoed by the [P12, Resource Governance NGO], “Transparency is not consistent and uneven, with local stakeholders rarely getting access to crucial revenue data and contracts.” National governments do not provide public access to this critical information for local communities and leaders, thereby creating suspicion between the locals and mining companies.

Enhanced transparency, which is often hindered by nondisclosure agreements (NDAs), legal gaps, and inadequate societal oversight, remains crucial to fostering trusting, productive cooperation between the US and Africa in the field of critical minerals. One of the participants [P2, U.S. Gov. Infrastructure] highlighted, "Legal loopholes and NDAs limit public questioning." The difficulties of proper oversight are also evident in the fact that even parliamentarians are usually unable to access contracts, as stipulated in their confidentiality clauses. [P8, Human Rights NGO] explained, "'most dealings are done in shadows. Contracts are not published, and environmental impact studies are not always available or are often submitted too late." In this case, the communities are left without information until mining begins, highlighting the need to emphasize that a lack of local participation in crucial data decisions breeds mistrust and undermines societal trust. "Most organizations are making an alignment and disclosing NDA publicly, but still not enough due to concerns from the local stakeholders" [P1, U.S. Gov. Policy]. Collectively, these aspects demonstrate that limited transparency hinders effective governance, erodes confidence in U.S. dealings, and impedes the ease of operations in U.S.-Africa mineral associations.

The isolation of local people and governments from mineral ventures contributes to social conflict and inefficiency in these processes. For instance, [P2, U.S. Gov. Infrastructure] highlighted, "in the case of a cobalt project in the DRC, one of the U.S. firms engaged in direct negotiations with a central ministry, circumventing local authorities and flouting local customary landholders." This disrupted the community and stalled operations, illustrating the negative consequences of marginalizing customary landholders and local governance mechanisms amid authority usurpation. [P8, Human Rights NGO] explained, "key problems of governance are a lack of local authorization and civil society being restrained to the margins of bargaining networks." This kind of exclusion creates mistrust, litigation, and reputational damage, which undermines the efficacy and integrity of U.S.-Africa collaborations in minerals immediately. Therefore, it would be essential to utilize local voices and respect customary land rights to prevent social unrest and harness the positive effects of partnership.

4.2. Fragmented coordination among multiple agencies and regional bodies

The study found that the United States has not established effective coordination mechanisms with regional bodies, which has negatively impacted its cooperation in the critical minerals area. The findings revealed that fragmented coordination among U.S. agencies and regional bodies is a primary driver of overlapping regulatory mandates, leading to inefficiencies and delays in critical mineral governance. The analysis of data from fourteen organizations consistently revealed a lack of proper collaboration among African regional institutions, such as the African Union and the SADC, as well as U.S. actors and local stakeholders. This leads to conflicting regulatory requirements that make obtaining permits and licenses difficult, as well as to enforcement policies and laws that are challenging to implement. For instance, [P13, Global Transparency NGO] noted,

> Permitting timelines are often extended, and regulatory uncertainty arises due to overlapping jurisdictional mandates. There is always a jurisdictional conflict between the local and national government in South Africa (SA), which causes delays and losses, as illustrated in South Africa's Vanadium project.

The findings further revealed that US-Africa cooperation on critical minerals faces challenges due to regulatory loopholes and weak enforcement mechanisms. They often allow projects to circumvent local and international standards, resulting in a lengthy approval process. [(P14, Business & Human Rights NGO)] noted, "projects normally take a long time before they are approved because the local authorities do not have proper coordination with international agencies." Poor coordination between U.S. actors and African regional institutions is a significant governance and transparency issue that undermines trust and operational efficiency. [P2, U.S. Gov. Infrastructure] noted, "coordination appears to be on paper but is rather superficial. Bilateral U.S. programs hardly mention such AU and SADC frameworks as the African Mining Vision." [P14, Business & Human Rights NGO] also said, "We see an empty promise in the SADC institutions that are not utilized as partners, as there is a lack of enforcement of what is promised at the front, but not put into practice." There is no coordination between U.S. institutions working in mineral areas and local and regional bodies. Reaffirmed the lack of coordination as a serious issue in the cooperation of the U.S. and African nations in the critical minerals [P5, Western Extraction] stated, "coordination is improving, but it remains fractured." It was further highlighted by [P8, Human Rights NGO], "The policies of the State Department and DFC financing are inconsistent with the framework of the African Union or the ICGLR." There is limited consultation with local governments and civil society, which undermines accountability and leads to fragmented governance.

4.3. Competition from China

Regarding competition as a bottleneck to US-Africa cooperation on critical minerals, the results revealed that China has an edge over the United States, making it difficult for the US to secure new partners. The competitive edge stems from China's approach to partnership deals with African governments. The study further revealed that China pursues infrastructure-for-access agreements. At the same time, the U.S. focuses on a rules-based mode of engagement, further internationalizing China's positioning in terms of speed and explicit infrastructure investment. [P6, African Rare Earth] pointed out, "the U.S. actors emphasize compliance with ESG instead of providing infrastructure, whereas China is faster and provides infrastructure." The sentiment is also supported by a statement from [P5, Western Extraction], "' Chinese models are less transparent, but much faster." Therefore, the approach enables China to obtain vital mineral resources and strategic locations through less visible yet convenient forms of engagement. However, the competition has African countries, such as the Democratic Republic of the Congo, becoming a battleground for global powers.

The high level of financial risk that China is willing to take, along with its rapid capital investment, is a significant factor contributing to the country's competitive advantage in the African critical minerals market. [P3, U.S. Mining] pointed out, "the U. S. is more apprehensive and turns to ESG, the Chinese one is much more observable and rapid in delivering infrastructure projects." It means China has used infrastructure development in Africa as a tool to enter into mineral extraction deals with governments. In this key area, the United States has failed to utilize properly. This sentiment was reinforced by [P12, Resource Governance NGO], "' Chinese models are faster but are often opaque'," and China has quicker but less transparent versions of them, and relies primarily on its infrastructure projects. All these factors give China an upper hand in the industry, making it more bureaucratic and risk-averse than U.S. players.

China's superior position in the extraction and processing of critical minerals in Africa forms part of its essential competitive advantage. This domination of the value chain, extending beyond raw-material extraction, enables China to position itself strategically in the industry. It poses a hazard to diversification and sustainability. [P9, Labor Rights NGO] noted, "'China has a dominant position in the refinery and processing, and this poses a threat to diversification and sustainability." The U.S. stands out for its strong emphasis on compliance with ESG requirements and on sustainable collaboration. To counter China's economic influence in Africa, investing in the development of African legal, technical, and negotiation skills would enable the U.S. to negotiate more effectively, secure better deals, and promote effective competition among the parties, leading to a more sustainable form of development and more equitable relationships.

4.4. Infrastructure and Investment Gaps

The findings showed that the infrastructure in the central African mineral-producing areas has a significant impact on the ease of trade activities between the U.S. and Africa, particularly in the trade of mineral ores, and it is economically viable. [P1, U.S. Gov. Policy] noted, "Roads located in mineral-rich zones are usually impassible. A poor road network and rail infrastructure drive up the cost and limit processing potential. Most value addition takes place abroad." Common denominators, such as inaccessible roads, a shortage of rail capacity and ports, and inefficient electricity, expose the firms to high operating costs, limited ability to undertake local processing, and decreased competitiveness.

The study revealed that U.S. strategies in the region prioritize infrastructure development. [P14, Business & Human Rights NGO] stated, "'The U.S. actors emphasize ESG adherence, but China is speedier and can provide infrastructure." The same sentiments were highlighted by P9 (Labor Rights NGO): "China has empowered African nations through construction of roads and rail, but still faces challenges in most countries from central African countries and other mineral-rich regions." However, [P01, U.S. Gov. Policy] stated,

> Governments will demand better deals, beneficiation within the country, and swaps of infrastructure for minerals, indicating that infrastructure has become a central platform in trade negotiations with African governments that exploit mineral resources to secure infrastructure development.

It is evident that there is a lack of better infrastructure in Africa, and leaders would take the necessary action, including exchanging minerals for infrastructure such as roads, rail, and other essential facilities. This, therefore, undermines the partnership, as without a willingness to assist with infrastructure development, it would be difficult to secure meaningful cooperation with African countries on critical minerals. These results depend on the institution's scale in bargaining and enforcing settlements. Therefore, investment in infrastructure and institutional capacity is a decisive factor in the geopolitical posturing and the triumph of the U.S.-Africa mineral trade. The factors vital to deriving benefits from infrastructure investments, particularly regarding the feasibility of mineral trade and cost-effective processes, include effective institutional coordination and simplification of bureaucratic procedures. (P1, U.S. Gov. Policy) suggested, "a policy of taking action at a faster pace, increasing financing, co-investing in infrastructure, and focusing efforts on skills transfer, while avoiding excessive bureaucratic procedures that deter local partners. "This underscores the fact that, in addition to physical infrastructure, governance systems and institutional efficiency determine the pace and effectiveness of infrastructure development, as

well as its benefits to the U.S. and African mineral trade. In the absence of such coordination, infrastructure investments can be postponed or incomplete, thereby preventing advancement in trade feasibility and costs.

4.5. Environmental and Social Concerns

The findings further revealed that environmental and labor standards are significant for local enforcement capabilities and the realities of the artisanal mining environment, which are not feasible for African producers to implement. Corporations operating in the mineral sector often fail to take the necessary steps to ensure compliance with environmental standards. [P2, U.S. Gov. Infrastructure] highlighted,

> The implementation of environmental standards is frequently hindered by mismatches between the standards and local enforcement capacity, and by an insufficient focus on the realities of artisanal mining, which is why the standards must reflect the local situation.

Despite having expertise in environmental issues, corporations often fail to take the necessary steps to maintain compliance. Therefore, environmental issues affecting local communities are often overlooked in favor of corporate profits and the interests of political elites.

> On-the-ground expertise can provide a cultural perspective and serve as a watchdog for human rights and compliance with environmental regulations, which are crucial for developing realistic, practical enforcement systems [P01, U.S. Gov. Policy].

The result showed that organizations operating in mining areas do not prioritize the United States' standards and changes in approach, which would help them gain access and acceptance from local communities. [P08, Human Rights NGO] Suggested, “US actors should co-create projects with communities and invest in their refining and not engage in extractive-only models, and national human rights due diligence is binding and not voluntary.” It means that the U.S. can regulate standards without inflicting an undue burden. It can be done by creating inclusive, contextual, and supportive mechanisms that regulate without making standards overly impractical for African producers. Addressing the environmental concerns would make it easier for the US companies to work with local stakeholders. This will enhance the cooperation between the US and African nations.

The designation of partnerships with the community and the empowerment of stakeholders will be key to maintaining rigorous environmental and labor standards while ensuring affordability. [P11, Labor Union NGO] noted, “U.S. must be prepared to support long-term engagements, invest in civil society monitoring, and see to it that communities are benefited beyond CSR marketing glossies.” The environmental and social concerns should be discussed at the project scope level to ensure all stakeholders are on board. It would be key for stakeholders to establish a mechanism to address concerns raised at an early stage, before a project commences. This sentiment is shared by [P09, Labor Rights NGO],

> “The U.S. actors need to co-develop projects with communities, and, in that regard, human rights due diligence needs to be designed in a binding implementation manner, so that local ownership and accountability can be developed.”

The strategies will minimize enforcement problems and foster confidence and safety regarding indirect costs, such as conflicts or legal disputes, enabling compliance and sustainability among African producers.

Progressive partnerships that recognize local agency and capacity are vital for achieving standards without introducing non-viable compliance costs. [P2, U.S. Gov. Infrastructure] stated, "it should avoid deals made in a top-down, extractive manner and instead phase partnerships with well-defined development benchmarks." This would allow producers to adapt gradually to environmental and labor standards. On the same note, [P1, U.S. Gov. Policy] points out, "here is a need to act faster, scale financing, co-invest in infrastructure, and factor in skills transfer." The same points were also echoed by [P10, Youth & Community NGO], who noted, "co-development with the community helps address environmental and social issues, and this could lead to enhanced relationships."

4.6. US-Africa Mineral Cooperation Strategies

The comprehensive and far-sighted U.S. mineral cooperation strategy should be based not only on supply chain security but also on governance, conflict resolution, and a trust-based, long-term partnership. "The U.S. policy is shallow–minded, it focuses on securing the supply chain from China and does not mind governance and conflicts" [P14, Business & Human Rights NGO]. It revealed that, despite the governance and conflict discussions in the press and papers championed by the U.S., some stakeholders feel the focus is on replacing the chain in the supply chain. [P01, U.S. Gov. Policy] pointed out, "the U.S. approach is to bring peace to the DRC, by solving the conflict between DRC and Rwanda, peace would be attained." The need for peace was also suggested by [P07, Resource Justice NGO], "peace in the region makes operation easier, and beneficial to all stakeholders. Rwanda-DRC peace initiative would close some issues, helping to build sustainability." The same sentiment was echoed by other participants, who emphasized the need to establish lasting peace for the sake of the people and the region, thereby enabling responsible sourcing. "The U.S. strategy is to advance the importance of transparent and responsible sourcing, but in most cases fails to initiate a people-centered or long-term development framework" [P09, Labor Rights NGO].

The findings, therefore, revealed that a change in the approach to investment in critical minerals would ease cooperation between the US and African countries. [P05, Western Extraction] stated, "We envision a scenario where a model incorporates long-term commitments, technology transfers, ESG-driven investments, and contributions to downstream processing in Africa through a partnership between the government and business."

This means an integrated strategy must be inclusive, development-oriented, and institutionally supportive to build sustainable U.S.-Africa partnerships. Aligning cooperation in mineral gains with African development and sovereignty objectives is crucial for establishing fair and sustainable relationships that foster long-term trust and strategic ties. [P02, U.S. Gov. Infrastructure] added,

> There is a mismatch: on the one hand, African countries need development, jobs, and sovereignty; on the other hand, U.S. interests are primarily focused on access and control, creating dependency rather than a true partnership.

5.0. Case Studies

5.1. Case Study 1: DRC Cobalt Governance

The Democratic Republic of the Congo (DRC) is one of the world's largest producers of cobalt. It is estimated to account for 70% of global cobalt production. This presents a complex and challenging environment for security and governance. Cobalt and other critical minerals are found in vast reserves in the DRC, presenting a complex governance issue. This is due to global demand for cobalt to power battery and other product production, positioning the DRC as a pivotal player in the global supply chain. However, the exploitation and mining of cobalt have been associated with secrecy, a lack of accountability and transparency, human rights violations, conflicts and tension within local communities, and environmental degradation. Most contracts for cobalt mining are signed in secret with top government officials, and the general public has no access to this information. A representative from the U.S. agency noted, "The government contracts and bilateral agreements are kept secret; local leaders and the people do not have access to them" [P02, U.S. Gov. Infrastructure]. The secrecy in mining dealings between U.S. Agencies and companies in the region is also noted by [P09, Labor Rights NGO], who state that "the secrecy in contracts makes it difficult to enforce labor laws and other regulations to protect workers." The same sentiments were also echoed by [P07, Resource Justice NGO], people get surprised when big companies take lands without compensation, people are told the land belongs to the company." The level of secrecy in cobalt dealings has made it impossible for people to receive compensation for their lands and secure good working conditions.

Cobalt governance is kept secret, and only a few elites are aware of the dealings that control the rights and finances. A few elites decide which company to grant the mining rights to and how the revenues are shared among themselves. The majority of Congolese are unaware of the cobalt revenue, and it has a negligible impact on their lives. "Cobalt mining is controlled by a small group of people who are associates of political leaders" [P7, Resource Justice NGO]. Artisanal miners are often evicted from the concession and then allocated to multinational companies. This leaves local communities with no access to their land or livelihoods, forcing them to rely solely on others for survival. One participant from a local Labor Union NGO pointed out, "People are told to leave their lands because the land belongs to the big company, but it is the same land their families have farmed for years" [P11, Labor Union NGO]. It leaves people with no voice, no control of their resources, and no opportunity to participate in decision-making on cobalt mining. This, therefore, leads to an increase in the poverty index, which supports the findings of several studies that rank the DRC among the world's poorest countries.

Furthermore, the DRC has a weak enforcement of labor and environmental laws, making it challenging for companies operating in the mineral areas to provide better pay to workers, protect the environment, and empower local communities. Several human rights violations, including child labor and environmental issues, are being reported in the cobalt mining areas, and the DRC government has done nothing. [P9, Labor Rights NGO] noted, "Companies want cobalt faster and cheaper…. they do not care about the governance." Most companies working in the cobalt areas primarily focus on extracting cobalt and shipping it away. The issue of governance is rarely asked or discussed to help improve the situation. This, therefore, creates a race to the bottom in governance, characterized by a lack of social responsibility and non-compliance with local and international laws and standards.

5.2. Case Study 2: SA-Angola Rare Earths

Rare earth elements are crucial for the manufacture of various electronic devices, including wind turbines, motor vehicles, and advanced electronics. China is the dominant player and the largest supplier of rare earths, although South Africa (SA) and Angola are emerging producers in Africa. It places South Africa and Angola as strategic partners of the United States in the critical mineral area. Angola and South Africa have the highest deposits of rare earth elements in Africa. With growing global demand, cooperation with the United States would help them reduce their dependence on China and build a new supply chain. Both countries are seen as complementary in supplying rare earths to the United States, and they offer a more favorable platform for cooperation due to their strict laws and robust infrastructure. One participant noted, "There is a government gap between South Africa and Angola related to how rules and frameworks are implemented" [P12, Resource Governance NGO]. The differences are based on the structures in place to ensure the efficient mining of rare earths and on the impact of profits on the community. [P04, African Mining] further pointed out, "SA uses mining codes, which have been tested in court; therefore, firms understand the rules. Angola structures are new and have not been tested, and can be risky to investors."

In Angola, the state owned most of the rare earth concessions through its enterprises. This gives the government absolute control over the rare earth elements. In South Africa, however, organizations or corporations own the rare-earth concessions, and the government has less control than in Angola. [P14, Business & Human Rights NGO] stated, "Politicians fully control Angola's minerals. State-owned firms decide who gets concessions and at what times." South Africa and Angola have introduced policies, known as local content, that give priority to local companies in procurement and the issuance of mining rights. [P13, Global Transparency NGO] highlighted, "In South Africa, local content policies are implemented at the procurement audit level. However, it does not exist in Angola, only in papers." This means that, when it comes to policy implementation, South Africa is strict and takes all necessary measures to ensure that rare-earth element mining is conducted in accordance with local laws. This differs from the situation in Angola, where foreign firms dominate despite a policy requiring consideration of local firms. Foreign firms often bypass policies because they can easily influence Angolan politicians, a practice that differs from South Africa. The mining of rare earth elements involves the use of radioactive materials, making environmental management a critical concern. Unfortunately, Angola's government is doing little to protect the communities living around mining areas. One of the participants added, "people living near the mining areas of rare earth do not understand the risk associated with the mining" [P14, Business & Human Rights NGO].

Table 3: Comparative Governance Characteristics DRC Cobalt vs SA–Angola Rare Earths

No	Governance Dimension	DRC – Cobalt Governance	SA–Angola Rare Earths Governance	Comparative Insights
1	Institutional Capacity	Poor regulation of mining codes, duplication of responsibilities between national and provincial governments, and a massive reliance on the artisanal and small-scale mining (ASM) sector.	South Africa: well-established, proven mining regulatory system; Angola: immature and untested regulations where there are enactment gaps.	In SA, regulatory stability prevails; Angola faces the same early-stage governance problems as the DRC, but with lower ASM activity.
2	Political Influence & State Ownership	Concessions are highly controlled by the state and elites, with licensing influenced by political patronage. Gecamines is a state-owned and dominant entity.	Angola: politically connected state-owned enterprises dominate the concessions; South Africa: its license is more transparent, and political lobbying does exist	Both DRC and Angola are experiencing the politicization of concessionary allocation, but SA has superior transparency in its procedures.
3	Transparency	Poor transparency, characterized by low levels of information disclosure, hinders participation in the Extractive Industries Transparency Initiative (EITI), and revenue leakage is often a significant concern.	South Africa: audited revenue systems; Angola: improving, but not transparent, with limited information published on contractual terms.	Angola has a similar revenue governance model to the DRC at an early stage; SA has the potential to adopt best practices.
4	Local Content & Community Benefits	Environmental assessments tend to underperform; ASM results in intense pollution and inadequate monitoring.	SA: Well-defined local sourcing regulations followed up by audits; Angola: They have regulations, but we circumvent them through political influence.	SA's enforcement is better than that of DRC and Angola; Angola's loopholes are similar to those in DRC.
5	Environmental & Social Governance (ESG)	Extensive reliance on Chinese businesses to invest, refine, and gain market access; few affiliations with the West.	A: better environmental compliance; Angola: little independent supervision, poor community consultations.	SA achieves more than the two; Angola suffers the same fate as DRC in terms of poor environmental management.
6	International Partnerships	Heavy dependence on Chinese companies for investment, refining, and market access; limited Western partnerships.	SA and Angola: in pursuit of diversification to EU and US markets in order to minimize reliance on China.	The two scenarios indicate a tactical shift towards non-Chinese partners, but capacity deficiencies may curtail their effectiveness.
7	Supply Chain Traceability	The issue of cobalt traceability remains challenging due to ASM and smuggling, despite limited coverage of certification schemes.	SA: more possibility of traceability; Angola: in its infancy, and systems still to be created.	The problem of traceability in the DRC is worse; the same issue could endanger Angola unless Angola intervenes early.

6.0. Policy Implications and Recommendations

The study revealed that the governance challenge in the Democratic Republic of the Congo (DRC) is primarily due to the opacity of contract negotiations and bilateral agreements, market-driven cobalt extraction, and centralized political control, which includes corruption and environmental issues. It is significant to take necessary steps to improve cobalt governance in the DRC. The US government should work closely with relevant stakeholders to enforce the mandatory disclosure of contracts and other bilateral agreements with any company involved in cobalt mining. The enforcement capacity of local governments should be enhanced through provincial-level capacity building on relevant laws, standards, and policies. The DRC government should also collaborate with international organizations to conduct due diligence on buyers before entering into any trade agreements related to cobalt extraction. This would ensure that local and international standards are observed by any company intending to extract cobalt in the region.

Recommendations:

- Contract Transparency should be introduced as a government policy, with all critical mineral contracts being reported on open contracting platforms to meet the standards of the Extractive Industries Transparency Initiative (EITI).
- Set up autonomous mining regulatory bodies with mandates, well-funded, and with professional independence.
- Adoption of blockchain certification platforms of mineral provenance to enhance source accountability within the supply chain and comply with international ESG standards.
- Mandatory Community Benefit Agreements (CBAs) in all the mining licenses should be embedded in them so that equitable benefit sharing with local communities is achieved.
- Investigate SADC-wide governance norms on critical minerals to streamline regulations and deter regulatory arbitrage.

7.0. Conclusion

The research investigated the challenges that deter the cooperation between the US and Africa in the critical minerals sector. It also focused on the challenges and opportunities in cobalt governance in the Democratic Republic of Congo, as well as in Angola and South Africa's rare earth elements. The findings revealed multiple challenges, including environmental and social concerns, infrastructure and investment gaps, fragmented coordination among multiple agencies and regional bodies, competition from China, transparency issues, corruption, and problems with contract disclosure. These challenges make it difficult for the United States to engage in practical cooperation with African nations in the critical minerals sector; therefore, appropriate action is needed. The analysis of the DRC cobalt governance revealed a serious gap in a mature, high-demand mineral market. However, Angola offers an opportunity for cooperation due to its stable governance and peace, enabling the United States to engage in the rare-earth element sector.

The findings further revealed that the availability of resources in a region does not determine development; rather, governance does. The Democratic Republic of the Congo has vast mineral resources, including Cobalt, lithium, and others, but it remains one of the poorest countries in the world. Development is anchored on transparency, governance, political stability, accountability,

and efficient policy design. The adoption of these factors determines whether critical minerals become an engine for a country's economic growth or drive inequality. The government should work closely with all stakeholders to shape policies and laws that safeguard the minerals and create an environment conducive to cooperation with other countries, thereby fostering sustainable growth.

By adopting the recommendations outlined, the United States would be able to address the challenges that deter its cooperation with mineral-rich African nations. A shift in approach to investing in critical minerals would facilitate cooperation between the US and African countries. Building the local community's capacity to develop sufficient expertise across various mining sectors is essential and would help foster better partnerships. The U.S. mineral cooperation strategy should be based not only on supply chain security but also on governance, conflict resolution, and a trust-based, long-term partnership.

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Appendix 1A: Participants' code, Sector, and Categories

Table 1A

No	Participant Code	Category	Sector
1	P01	U.S. Government Agency	Public Sector – Government Policy & Diplomacy
2	P02	U.S. Government Agency	Public Sector – Critical Minerals & Infrastructure
3	P03	Critical Minerals Project – U.S. Company	Private Sector – Mining & Exploration
4	P04	Critical Minerals Project – African Company	Private Sector – Mining & Exploration
5	P05	Critical Mineral Project – Western Company	Private Sector – Mining & Extraction
6	P06	Critical Minerals Project – African Company	Private Sector – Rare Earth Extraction
7	P07	African NGO Representative	Civil Society – Resource Justice Advocacy
8	P08	African NGO Representative	Civil Society – Human Rights Advocacy
9	P09	African NGO Representative	Civil Society – Labor Rights
10	P010	African NGO Representative	Civil Society – Youth and Community Development
11	P11	African NGO Representative	Civil Society – Labor Union Advocacy
12	P12	African NGO Representative	Civil Society – Resource Governance Monitoring
13	P13	International NGO Representative	Civil Society – Global Resource Transparency
14	P14	International NGO Representative	Civil Society – Business & Human Rights

Appendix 1B: Quote Coding Key

Table 1B

No	Participant Code	Category	Sector	Citation Intext
1	P01	U.S. Government Agency	Public Sector – Government Policy & Diplomacy	(P01, U.S. Gov. Policy)
2	P02	U.S. Government Agency	Public Sector – Critical Minerals & Infrastructure	(P02, U.S. Gov. Infrastructure)
3	P03	Critical Minerals Project – U.S. Company	Private Sector – Mining & Exploration	(P03, U.S. Mining)
4	P04	Critical Minerals Project – African Company	Private Sector – Mining & Exploration	(P04, African Mining)
5	P05	Critical Mineral Project – Western Company	Private Sector – Mining & Extraction	(P05, Western Extraction)
6	P06	Critical Minerals Project – African Company	Private Sector – Rare Earth Extraction	(P06, African Rare Earth)
7	P07	African NGO Representative	Civil Society – Resource Justice Advocacy	(P07, Resource Justice NGO)
8	P08	African NGO Representative	Civil Society – Human Rights Advocacy	(P08, Human Rights NGO)
9	P09	African NGO Representative	Civil Society – Labor Rights	(P09, Labor Rights NGO)
10	P010	African NGO Representative	Civil Society – Youth and Community Development	(P10, Youth & Community NGO)
11	P11	African NGO Representative	Civil Society – Labor Union Advocacy	(P11, Labor Union NGO)
12	P12	African NGO Representative	Civil Society – Resource Governance Monitoring	(P12, Resource Governance NGO)
13	P13	International NGO Representative	Civil Society – Global Resource Transparency	(P13, Global Transparency NGO)
14	P14	International NGO Representative	Civil Society – Business & Human Rights	(P14, Business & Human Rights NGO)

Appendix 2: Codebook Table

Table 2a:

No	Theme No	Main Theme	Sub-theme(s)	Participant Codes (from Appendix 1B)
1	T01	Governance & Policy Frameworks	1. U.S.–Africa strategic cooperation policy gaps 2. Alignment with African Union mineral strategies	P01, P02, P12
2	T02	Critical Minerals Supply Chain Development	1. Upstream mining challenges in Africa 2. Midstream processing and refining capacity 3. Downstream manufacturing potential	P01, P02, P12
3	T03	Infrastructure & Investment	1. Transport and logistics barriers 2. Energy infrastructure for mineral processing 3. Foreign direct investment risks	P02, P03, P04, P05
4	T04	Transparency & Resource Governance	1. Anti-corruption and transparency initiatives 2. Monitoring extractive industries 3. Public reporting obligations	P12, P13
5	T05	Human Rights & Social Impact	1. Labor rights and fair wages 2. Indigenous and community rights 3. Gender equity in mining communities	P07, P08, P09, P11, P14
6	T06	Environmental Sustainability	1. Ecological restoration after mining 2. Climate change resilience in mining operations 3. Resource efficiency practices	P06, P07, P13, P14
7	T07	Civil Society & Community Engagement	. Youth participation in resource governance 2. Grassroots advocacy networks 3. Public consultation processes	P07, P08, P09, P10, P11
8	T08	Geopolitical & Market Dynamics	1. Competition between Western and Chinese investments 2. Global pricing volatility 3. Security of supply agreements	P01, P02, P03, P05

Appendix 3: Quotation Matrix

Table 3a

No	Theme No	Main Theme	Sub-theme(s)	Participant Code(s)	Illustrative Quotes
1	T01	Governance & Policy Frameworks	U.S.–Africa strategic cooperation policy gaps	P01	
			Alignment with the African Union and SADC mineral strategies	P02	
2	T02	Critical Minerals Supply Chain Development	Upstream mining challenges in Africa	P03	
			Midstream processing and refining capacity	P04	
			Downstream manufacturing potential	P05	
3	T03	Infrastructure & Investment	Transport and logistics barriers	P02	
			Energy infrastructure for mineral processing	P03	
			Foreign direct investment risks	P05	
4	T04	Transparency & Resource Governance	Anti-corruption and transparency initiative	P12	Transparency is inconsistent and uneven, with local stakeholders rarely gaining access to crucial revenue data and contracts.
			Monitoring extractive industries	P13	
5	T05	Human Rights & Social Impact	Labor rights and fair wages	P09	
			Indigenous and community rights	P08	
			Gender equity in mining communities	P14	
6	T06	Environmental Sustainability	Ecological restoration after mining	P06	
			Climate change resilience in mining operations	P07	
			Resource efficiency practices	P13	
7	T07	Civil Society & Community Engagement	Youth participation in resource governance	P10	
			Grassroots advocacy networks	P07	
			Public consultation processes	P11	
8	T08	Geopolitical & Market Dynamics	Competition between Western and Chinese investments	P01	
			Global pricing volatility	P03	
			Security of supply agreements	P05	

Appendix 4: Questionnaire Forms

Table 5: Questionnaire Forms for Interview

Section 1: Stakeholder Context and Role (Understanding Institutional and Personal Perspectives)		
No	**Questions**	**Response**
1	Can you describe your organization's mission and how it connects with critical mineral governance or development in Africa?	
2	How did your organization become involved in the mineral sector, and what has been your experience working with international stakeholders, especially the U.S.?	
3	From your perspective, what is the significance of critical minerals for your country or region?	
4	Could you share specific examples of projects or partnerships your organization is involved in, particularly those linked to U.S. actors or policies?	
5	In your interactions with U.S. agencies or companies, what kind of engagement or support have you received?	
6	What value do you believe local organizations like yours add to shaping or monitoring critical mineral cooperation agreements?	
Section 2: Strategic and Diplomatic Cooperation - Exploring Perceptions and Policy Impact		
No	**Questions**	**Response**
1	How would you characterize the U.S.'s overall strategy or approach to engaging African countries in critical mineral development?	
2	To what extent do you think this cooperation reflects mutual interests between African states and the U.S.? Why or why not?	
3	How have U.S. diplomatic efforts influenced peace-building or development-linked mineral agreements in conflict-prone areas like the DRC?	
4	What types of coordination exist between U.S. agencies, e.g., the State Department, DFC, and regional African bodies, e.g., SADC, and AU, in shaping mineral policies?	
5	**Can you recall a specific case where U.S. diplomatic or financial support influenced a mining agreement or project outcome, positively or negatively?**	
6	In your opinion, what would an ideal strategic cooperation between the U.S. and African states on minerals look like?	

Section 3: Governance and Operational Barriers - Identifying Systemic and Institutional Challenges		
No	**Questions**	**Response**
1	From your experience, what are the main governance challenges facing mineral projects involving U.S. actors?	
2	How transparent are these engagements from the negotiation phase through to implementation?	
3	Have you observed instances of weak regulatory oversight or power imbalance in U.S.-linked mineral partnerships? Could you describe one?	
4	What specific logistical or infrastructure constraints have affected mineral production, transport, or processing in your area?	
5	**How do political instability or conflicts, e.g., DRC–Rwanda relations, affect operational continuity and U.S. participation in mining projects?**	
6	What role do local or national governments play in safeguarding local interests within U.S.-Africa mineral partnerships? Are there gaps?	
Section 4: Environmental and Social Implications - Exploring Community and Sustainability Issues		
No	**Questions**	**Response**
1	**What environmental concerns have emerged from critical mineral projects involving U.S.-linked partners in your region?**	
2	To what extent are environmental impact assessments conducted, and are local communities consulted adequately?	
3	Can you describe how communities are benefiting, or fail to benefit, from these projects in terms of health, education, employment, or compensation?	
4	How are labor rights, working conditions, and worker safety addressed in the projects you are familiar with?	
5	**Have there been conflicts or grievances from communities related to land, displacement, or pollution? How have they been addressed?**	
6	How would you evaluate the responsiveness of U.S.-backed companies or agencies to environmental or social accountability concerns?	
Section 5: Geopolitics and Global Competition (Understanding Strategic Positioning and Rivalries		
No	**Questions**	**Response**

1	**How do you perceive the geopolitical competition between the U.S., China, and other powers in Africa's mineral sector?**	
2	What distinguishes U.S. involvement from Chinese or European models, in terms of transparency, conditions, or outcomes?	
3	How has this competition shaped the bargaining power of African countries in securing better deals or maintaining policy independence?	
4	Have you observed any shifts in policy or investment strategies due to this global rivalry? If so, what are the effects?	
5	**Do you believe U.S. actors are engaging enough with local realities, including conflict dynamics and political sensitivities?**	
6	What do you think are the risks and opportunities of Africa becoming a central arena in the critical minerals 'race' between global powers?	
Section 6: Policy Gaps, Recommendations, and the Way Forward (Soliciting Insight for Reform)		
No	**Questions**	**Response**
1	**What are the most urgent reforms needed in African countries to strengthen governance and benefit from critical mineral resources?**	
2	From your perspective, what can U.S. agencies or companies do differently to ensure partnerships are equitable and development-oriented?	
3	How can civil society, unions, and local communities be better integrated into decision-making on mineral projects?	
4	What policies or safeguards would you recommend to ensure that critical minerals projects are environmentally and socially sustainable?	
5	**In your view, what would a 'successful' U.S.–Africa critical mineral cooperation model look like by 2030?**	
6	Are there specific lessons from existing partnerships or failed projects that should guide future engagement between U.S. and African actors?	
7	Based on your optimistic/pessimistic stance toward U.S. engagement, what specific advocacy plans or collaborative actions will your organization undertake in the next 18 months to advance mineral sovereignty priorities?	