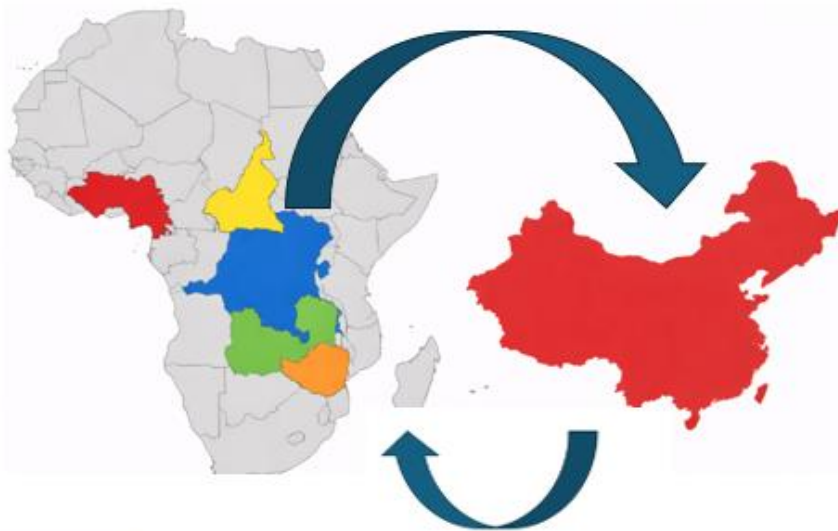




## China's Resources-for-Infrastructure (R4I) Model Contribution or Constraint to the Transformational Development of the Cameroon, Democratic Republic of Congo, Guinea, Zambia and Zimbabwe A Comparative Study



In collaboration with:



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## LIST OF ABBREVIATIONS

ACGM	African Coalition on Green Minerals
ACNR	African Centre for Natural Resources
AfDB	African Development Bank
AFREWATCH	African Resources Watch
AMG	Action Mines Guinee
BRI	Belt and Road Initiative
CATIC	China National Aero-Technology Import and Export Corporation
CHEXIM	China Exim Bank
CNEEC	China National Electric Engineering Corporation
DRC	Democratic Republic of Congo
EITI	Extractive Industries Transparency Initiative
ESG	Environment Social and Governance
ESIA	Environmental and Social Impact Assessment
ESF	European Social Fund
IATI	International Aid Transparency Initiative
IEA	International Energy Agency
IFC	International Finance Corporation
IMF	International Monetary Fund
LIC-DSF	Debt Sustainability Framework for Low-Income Countries
NRGI	Natural Resource Governance Institute
PWYP	Publish What You Pay
R4I	Resource for Infrastructure
RBLs	Resource Based Loans
SOEs	State Owned Enterprises
Sicomines JV	Sicomines Joint Venture
UNESCO	United Nations Education, Scientific and Cultural Organisation
WB	World Bank
YPD	Youth for Promotion of Development
ZELO	Zimbabwe Environmental Law Organisation

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## EXECUTIVE SUMMARY

Persistent infrastructure deficits continue to constrain structural transformation, industrialisation, and inclusive growth across much of sub-Saharan Africa. Limited fiscal space, rising public debt, and prolonged disengagement from international financial institutions have reduced access to concessional finance, pushing governments to seek alternative funding mechanisms. Within this context, Resource-for-Infrastructure (R4I) arrangements—also known as resource-backed or investment-for-resource models—have re-emerged as a prominent development financing option.

R4I models link infrastructure financing and delivery to future resource revenues or collateralised mineral concessions. Their contemporary resurgence is closely associated with China's expanding role in resource-rich countries' infrastructure and extractive sectors within the framework of its Belt and Road Initiative (BRI). In some African countries, these partnership model intensified from the mid 1990s, driven by a convergence of interests with the governments seeking flexible, large-scale infrastructure finance, while China aims to secure long-term access to strategic minerals critical for industrial upgrading and the global energy transition. The accelerating global push toward decarbonisation has further elevated the importance of R4I arrangements, as demand for transition minerals such as lithium, cobalt, copper, and nickel rises sharply.

This report presents findings using a comparative lens from desk studies conducted in Cameroon, the Democratic Republic of Congo, Guinea, Zambia, and Zimbabwe focussed on how the model is structured, the governance and development impacts, highlighting specific case studies of specific infrastructure projects supported under the R4I partnership model.

These arrangements have enabled visible infrastructure delivery, but have also raised concerns regarding transparency, governance, environmental and social impacts, and the extent of long-term developmental spillovers. While these countries are struggling to address the existing challenges in this model, Beijing has started shifting away from the traditional model of massive, state-led infrastructure projects in exchange for natural resources deals toward smaller-scale, more commercially sustainable, and financially prudent engagements to minimise the debt and economic risks. This highlights the risks for resource-rich countries, and the study offers valuable lessons for their governments and civil society to consider in a new partnership model.

The comparative analysis illustrates both the opportunities and risks associated with R4I including with including:

### **R4I Does Not Eliminate Debt Risk—It Repackages It and Sustains Debt**

- Across Cameroon, DRC, Guinea, Zambia, and Zimbabwe, R4I arrangements shifted fiscal risk into commodity-linked obligations rather than removing it.
- Governments remained exposed to commodity price volatility, production shortfalls, and limited value addition—most evident in the DRC, where weak beneficiation and mining underperformance delayed repayments while liabilities accumulated.

- Opacity amplified debt risk: limited disclosure of contract terms, repayment schedules, and contingent liabilities undermined debt management and accountability, particularly in DRC and Zimbabwe.

### **Local Content and Spillovers Are Not Automatic**

- While infrastructure delivery improved, domestic economic multipliers remained weak in Zambia, DRC, and Cameroon.
- Tied procurement, reliance on foreign contractors, and imported labour and inputs constrained local firm participation, skills transfer, and technology diffusion.
- Cameroon highlights persistent operational dependence where contracts lacked enforceable skills transfer and operations-and-maintenance (O&M) handover provisions.

### **Governance, Transparency, and Safeguards Are the Core Fault Line**

- Weak governance consistently undermined outcomes, particularly where confidentiality clauses and executive dominance limited parliamentary scrutiny (notably in Zimbabwe and DRC).
- Bypassing environmental and social safeguards in Cameroon and Guinea created lasting social, environmental, and political liabilities.
- International safeguard frameworks (World Bank ESF, AfDB standards) emerged as credible governance benchmarks, even outside IFI financing.

## RECOMMENDATIONS

### 1. For the governments of Cameroon, DRC, Guinea, Zambia, and Zimbabwe

- Place governance reform at the core of all Resource-for-Infrastructure (R4I) agreements, recognising them as public-interest instruments.
- Mandate full public disclosure of all R4I contracts, annexes, amendments, and repayment schedules.
- Require parliamentary ratification of all R4I agreements that create fiscal obligations, restoring legislative oversight and checks and balances.
- Fully integrate R4I commitments into national debt management frameworks, including contingent liabilities and commodity price risks.
- Ensure routine, independent audits by supreme audit institutions, with findings made public.
- Align project selection with national development plans, prioritising high-impact economic corridors and social infrastructure over politically visible or fragmented projects.
- Enforce binding local content, technology transfer, and skills development clauses, supported by independent verification mechanisms.
- Make environmental and social safeguards mandatory, including validated ESIAs, community consultation, and benefit-sharing—particularly in ecologically sensitive and resource-rich areas.

### 2. For China and Chinese Financial and Corporate Actors

- Reposition R4I as a credible development partnership by moving from voluntary

guidelines to enforceable overseas ESG standards.

- Allow and encourage contract transparency, including borrower-led disclosure of agreements.
- Strengthen anti-corruption provisions, community consultation requirements, and grievance redress mechanisms.
- Institutionalise local capacity-building and value-chain development, including beneficiation, processing, and downstream industries linked to transitional minerals.
- Improve transparent reporting on project costs, timelines, and performance to build trust and counter perceptions of asymmetric or exploitative arrangements.

### 3. For Civil Society, Regional Bodies, and International Partners

- Support civil society, media, and local communities to conduct systematic monitoring and “citizen audits” of R4I projects.
- Translate complex R4I contracts into accessible public information to strengthen accountability.
- Promote harmonised minimum standards for resource-backed financing across Africa, covering transparency, procurement integrity, and safeguard compliance.
- Enable international financial institutions and regional development banks to provide a governance floor by offering technical assistance on disclosure, debt transparency, and safeguards, even without financing.

## 0. Introduction

Across much of sub-Saharan Africa, persistent infrastructure deficits remain a central constraint on structural transformation, industrialisation, and inclusive economic growth. Despite decades of engagement by multilateral development banks and traditional bilateral donors, large gaps in transport, energy, water, and logistics infrastructure continue to undermine productivity, regional integration, and value addition in resource-rich economies. These challenges have been exacerbated by rising public debt burdens, macroeconomic instability, and increasingly constrained access to concessional finance particularly in countries experiencing fiscal distress or prolonged disengagement from international financial institutions (IFIs).

Within this context, resource-linked financing has re-emerged as an attractive alternative for governments seeking to mobilise large-scale development finance (Wang et al., 2023). Resource-for-Infrastructure (R4I) arrangements also referred to as resource-backed or investment-for-resource models link access to natural resources to the provision of infrastructure financing and delivery (Mihalyi 2022). Under these arrangements, repayment is secured directly or indirectly through future resource revenues or collateralised resource concessions (Mihalyi 2022). Resource-backed loan models are historically rooted in earlier experiences such as Peru's guano-backed borrowing in the nineteenth century (Viscarra 2009). During that period, Peru mortgaged its guano exports to European creditors to secure infrastructure and public financing. The contemporary resurgence of R4I has been most closely associated with China's expanding role as a development finance actor since the early 2000s (Viscarra 2009)

China's growing prominence in Africa's infrastructure and extractives sectors reflects a convergence of interests (Finocchi and Finocchi 2025). On the one hand, African governments particularly those rich in minerals but fiscally constrained require flexible, large-scale financing to close infrastructure gaps that limit development but cannot access concessional and development financing, particularly from the World Bank and the International Monetary Fund IMF for over two decades.

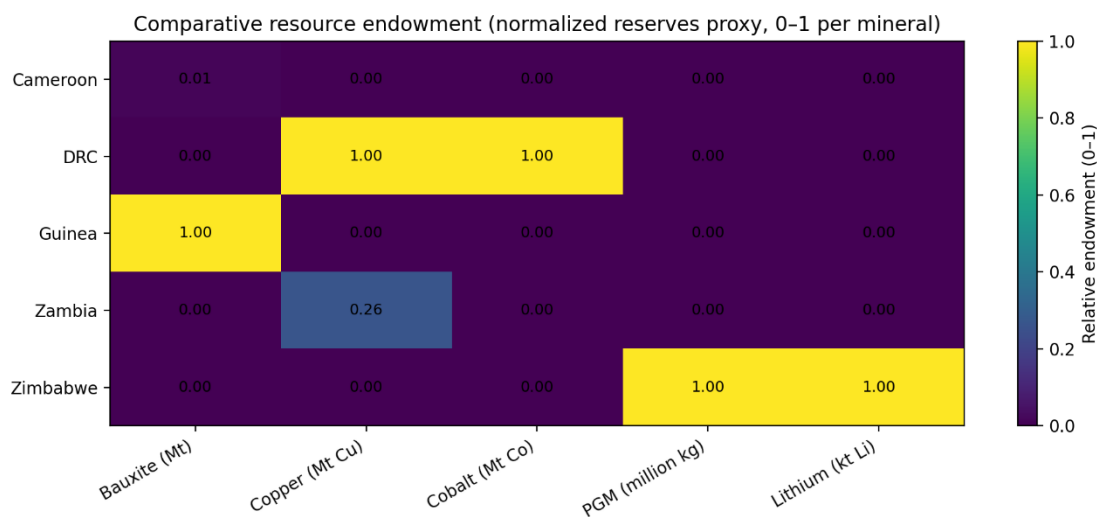
On the other hand, China seeks secure, long-term access to strategic raw materials necessary to sustain its industrial upgrading, technological leadership, and energy transition ambitions. Leveraging its substantial financial liquidity and state-owned policy banks, notably the China Development Bank and the Export-Import Bank of China, China has positioned the R4I model as a cornerstone of its overseas economic engagement, particularly within the framework of the Forum on China-Africa Cooperation and the Belt and Road Initiative (Finocchi and Finocchi 2025). While China emerged in the 2000s as the major proponent of the model and used this to support its development objectives, it is worth noting that the COVID-19 pandemic raised significant concerns around widespread debt sustainability challenges in developing countries coupled with volatility in commodity prices (Mihalyi, D et al., 2022). A defining feature of this engagement has been the Resources-for-Infrastructure (R4I) model also described as resource-backed or investment-for-resource arrangements through which access to natural resources is exchanged for infrastructure financing and delivery, often operating outside the policy conditionalities and governance frameworks associated with traditional development assistance.

The global push toward decarbonisation has further elevated the strategic significance of R4I arrangements. Demand for critical and transition minerals including lithium, cobalt, copper, nickel, iron ore, and platinum group metals is projected to rise exponentially as countries pursue climate targets under the Paris Agreement. According to recent projections, global demand for lithium and cobalt could increase by factors of 40 and 20 respectively by 2040, intensifying competition for mineral-rich regions. Many countries in Africa host a significant share of these minerals, and with the surging demand, the Government of these countries expect to leapfrog from being mere exporters of raw materials but move up the value chain through beneficiation strategies, generated revenue to diversify their economies and meet their developmental visions, aspirations for transformational development (ZELA 2023, Afrewatch/CNPAV 2024, ). However, this is contingent on their ability to attract finance and investment.

China’s dominance across mineral processing and battery supply chains has reinforced its incentive to secure upstream access, while African countries increasingly view mineral-backed infrastructure deals as a means to monetise resource endowments for development purposes.

Cameroon, the Democratic Republic of Congo (DRC), Guinea, Zambia, and Zimbabwe exemplify this dynamic. Some of these countries possess globally significant reserves of minerals essential to the global energy transition compared to others, alongside acute infrastructure deficits and have attracted much interest from China from the 2000s (see figure 1).

Figure 1: Resource heatmap with a “1.00” in a column indicating the country with the largest mineral shares amongst the five countries in Africa.



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Yet they differ markedly in governance quality, institutional capacity, fiscal space, and political economy conditions factors that shape how R4I arrangements are negotiated, implemented, and experienced. The DRC’s 2008 Sicomines agreement remains one of the most emblematic and controversial R4I deals globally, linking copper and cobalt concessions to multi-billion-dollar infrastructure commitments amid persistent concerns over contractual opacity and

limited developmental spillovers. In Cameroon, projects such as the Mékin hydroelectric dam have highlighted environmental, social, and transparency risks associated with R4I implementation in ecologically sensitive areas

Guinea's experience underscores the growing relevance of R4I in the context of transition minerals. Home to approximately two-thirds of global bauxite reserves and significant iron ore, graphite, and emerging lithium and nickel prospects, Guinea occupies a strategic position in the global energy transition. However, weak infrastructure, limited downstream processing, and governance challenges constrain its ability to translate mineral wealth into transformative development outcomes. Resource-for-infrastructure arrangements have thus been framed as both an opportunity to accelerate infrastructure delivery and a risk to transparency, public participation, and long-term value creation

Zambia and Zimbabwe illustrate more project-based and sector-specific applications of the R4I model. In both countries, Chinese-financed infrastructure has delivered visible improvements in roads, energy, and urban facilities, particularly where traditional financing channels proved inadequate. At the same time, opaque contracts, tied procurement, limited local content, and exposure to commodity price volatility have raised concerns regarding fiscal sustainability, governance, and the depth of developmental spillovers

## **0.1. Objectives of the Study**

### **Overall Objective**

The overarching objective of this study is to critically and comparatively assess whether China's Resources-for-Infrastructure (R4I) model constitutes a contribution to, or a constraint on, the transformational development of Cameroon, the Democratic Republic of Congo, Guinea, Zambia, and Zimbabwe, particularly in the context of rising global demand for critical and transition minerals and intensifying competition over resource-based development pathways.

### **Specific Objectives**

- Analyse the structure and operation of R4I agreements, focusing on their design and implementation across countries. Consider financing mechanisms, the use of natural resources as collateral, key institutional actors, and the types of infrastructure delivered.
- Evaluate the impact of R4I-financed projects on access to, quality, and sustainability of infrastructure in transport, energy, and social sectors, and their alignment with national development strategies.
- Analyse the implications of R4I agreements on governance, transparency, and accountability, focusing on public financial management, contract transparency, parliamentary oversight, environmental and social safeguards, and citizen participation in each country.
- Assess how R4I projects impact local capacity, technology transfer, and value addition, focusing on domestic skills development and linkages to industrialization and mineral value-addition goals.

## **0.2. Methodology**

This study employs a harmonised comparative research methodology to assess whether China's Resource-for-Infrastructure (R4I) model operates primarily as an enabler or a constraint to economic governance transitions in the minerals sector across five African countries: Cameroon, the Democratic Republic of Congo, Guinea, Zambia, and Zimbabwe. A desk-based study approach with thematic analysis informed by a transformational development lens and systematic triangulation of sources, and structured cross-country comparison.

### **Study design and comparative logic**

The research is designed as a multi-country comparative case study. This approach is well-suited to the research question, as all five target countries are resource-rich, face substantial infrastructure deficits, and have engaged either formally or functionally with Chinese financing and investment arrangements that link mineral extraction to infrastructure delivery. At the same time, these countries display significant variation in legal frameworks, fiscal governance capacity, transparency practices, mineral endowments, and political economy conditions. This combination of shared structural characteristics and divergent governance outcomes allows the study to integrate both a “most similar systems” logic and a “most different systems” logic, strengthening the basis for comparative inference regarding the governance effects of R4I arrangements.

The unit of analysis is the R4I model as implemented within each country. Rather than treating R4I as a single contractual form, the study conceptualises it as a bundle of institutional practices that link mineral revenues or future resource flows to infrastructure financing and delivery. Analysis is conducted across three interrelated levels: the deal level (focusing on the structure and terms of major R4I-type arrangements or their closest functional equivalents), the sectoral level (examining implications for mineral and infrastructure governance), and the system level (assessing broader effects on fiscal governance, accountability institutions, and public participation).

### **Data collection and sources**

The study relies primarily on systematic desk-based and documentary research, leveraging on many years of work on the ground following up implementation of partnership including with China. This reflects both feasibility considerations and the reality that R4I arrangements are frequently characterised by limited public disclosure. Data sources include national laws and policies on mining, public finance, procurement, investment, land, and environmental and social impact assessment, national development plans and infrastructure strategies, audit reports, parliamentary records, debt statistics, and budget documents, publications by international financial institutions and regional development banks, academic literature, and civil society and watchdog reports. Data was collected by the member organizations of the African Green Minerals Coalition in each country.

Where contracts are not publicly accessible, the study makes structured use of “contract proxies” such as Extractive Industries Transparency Initiative reports, project implementation reports, and secondary analyses that reconstruct key contractual terms. Media sources are

used cautiously and primarily for contextualisation and triangulation. All countries are assessed using the same categories of sources and inclusion criteria to ensure consistency and comparability.

### **Analytical framework and comparative assessment**

A harmonised thematic framework is applied across all cases, structured around four analytical domains:

- (i) the design and modalities of R4I arrangements, including financing mechanisms and institutional roles;
- (ii) developmental outcomes, particularly infrastructure delivery;
- (iii) governance and fiscal implications, including transparency, accountability, debt sustainability, and budget oversight; and
- (iv) local capacity building and domestic value creation. Each domain is analysed through an explicit governance-transition lens, focusing on changes over time in transparency, accountability, rule compliance, public participation, and fiscal governance practices.

To move beyond descriptive analysis, the study applies a standardised assessment rubric to determine whether R4I arrangements function as enablers or constraints to governance transition. Positive governance effects are weighed alongside development outcomes, recognising that infrastructure delivery alone does not equate to improved governance. Mixed outcomes are explicitly identified and analysed in relation to the conditions under which benefits or risks prevail.

### **Validation and limitations**

The Country-specific findings were reviewed iteratively by the Coalition member organisations alongside subject-matter experts in each country to verify factual accuracy and contextual interpretation. The methodology also explicitly acknowledges limitations arising from non-disclosure, inconsistent reporting, and data gaps. Rather than treating missing information as neutral, this was documented as an indicator of governance quality. By applying uniform analytical standards across all cases, the methodology ensures that comparative conclusions reflect substantive governance dynamics rather than variations in data availability.

## **1. Conceptualizing the Chinese Resource-for-Infrastructure (R4I) Model in Africa**

The conceptualisation of the Chinese Resource-for-Infrastructure (R4I) model in the African context can be traced to its first large-scale application in Angola in the early 2000s. During this period, China's state-owned development banks, notably the Export-Import Bank of China and the China Development Bank, extended resource-backed loans (RBLs) to the Angolan government. These loans were to be repaid through revenues generated from Angola's oil exports, thereby linking infrastructure finance directly to natural resource extraction (Brautigam, 2009).

Since its introduction in Angola, the R4I model has been applied in several resource-rich countries across Africa and beyond. A study by the Natural Resource Governance Institute (NRGI) examined 52 resource-backed loans issued in sub-Saharan Africa and Latin America

between 2004 and 2018, finding that recipients were predominantly state-owned enterprises and national oil companies (NRGI, 2020). While the model is often perceived as uniquely Chinese, it is important to note that China itself previously employed a similar financing arrangement as a borrower rather than a lender.

In the 1970s, Japan extended low-interest loans to China to finance the importation of Japanese technology. Repayment was structured through Chinese exports of oil and coal of equivalent value. Under these agreements, infrastructure projects were directly linked to commodity repayment: oilfield construction was financed by oil revenues, coal mine development by coal exports, and factory construction by the sale of manufactured goods. These Japanese loans were instrumental in expanding China's transport and export infrastructure, facilitating the shipment of raw materials to Japan. As a result, Japanese firms benefited commercially, while China significantly enhanced its infrastructure base, laying the foundation for sustained economic growth (Brautigam, 2009). Having gained domestic experience with this model, China later adapted it as part of its development cooperation framework to secure access to critical raw materials abroad.

Although China's domestic experience informed the R4I model, several additional factors contributed to its adoption and refinement in resource-rich developing countries. Some scholars argue that China's growing demand for natural resources to sustain rapid industrialization, coupled with its substantial foreign exchange reserves, were central drivers of the model (Alden, 2007). However, Brautigam (2011) contends that the shift was also strategic, as China recognized that Western governments and multilateral institutions were retreating from large-scale infrastructure financing in Africa. This withdrawal created space for an alternative approach, with resource-backed loans emerging as a practical mechanism for diversifying China's resource supply while addressing Africa's infrastructure deficit.

According to Alden (2007), a key turning point occurred in 1994 when China became a net importer of oil, as domestic economic growth began to outpace national resource production. This structural shift marked the genesis of China's outward-looking resource acquisition strategy and the subsequent expansion of the R4I model.

The R4I framework can be defined as a financing arrangement in which loans used for infrastructure development are repaid through natural resources. More specifically, R4I represents a subcategory of collateralised lending in which a country's natural resources serve as collateral, a repayment source, or a guarantee for loans extended to a state or state-owned enterprise (SOE) by another state, a private actor, or an international financial institution. Beyond resource-backed loans, governments may also employ non-commodity collateralized financing mechanisms linked to infrastructure assets such as ports or toll roads, where repayment is secured against a variety of asset classes, including export revenues.

The International Monetary Fund (IMF) and the World Bank (WB) define collateralized loans as arrangements in which:

“The creditor has rights over an asset or revenue stream that would allow it, if the borrower defaults on its payment obligations, to rely on the asset or revenue stream to secure repayment of the debt. In a legal sense, it entails a borrower granting licenses over specific existing assets or future receivables to a lender as security against repayment of the loan. More broadly, it also

includes arrangements that do not constitute granting of a security interest, but that have an equivalent effect” (IMF & World Bank, 2020).

The Chinese R4I model has gained increased prominence in the context of limited access to concessional finance from multilateral institutions such as the World Bank and the IMF. Many developing countries, including Zimbabwe, face structural barriers to such financing due to debt arrears, macroeconomic instability, and governance concerns. In this environment, China’s R4I approach is often viewed as attractive because it offers relatively flexible, timely, and less conditional financing for urgently needed infrastructure development (Brautigam, 2011).

This perception was articulated by Sierra Leone’s former Minister of Foreign Affairs, Alhaji Momodu Koroma, who emphasized the distinction between Chinese financing and Western aid models, stating that China supports projects identified by recipient governments themselves, rather than imposing externally determined priorities (Koroma, cited in Alden, 2007). Such sentiments reflect a broader preference among borrowing governments for financing arrangements that emphasize national ownership and policy autonomy.

Ultimately, China’s engagement with Africa through the R4I model is grounded in pragmatic mutual interest. The framework enables resource-rich developing countries to leverage their natural endowments for infrastructure development without immediately drawing on scarce foreign exchange reserves, while simultaneously allowing China to secure long-term access to strategic resources (Brautigam, 2009).

Nevertheless, the model has attracted significant criticism. Butts and Bankus (2009) argue that China’s approach may undermine democratic governance and accountability in African states. Similar concerns are raised by Egbula and Zheng (2011), who suggest that the absence of governance conditionalities could weaken institutional development. Kelley (2010) warns that Chinese investment may exacerbate governance challenges associated with the resource curse, while Meyersson, Padró i Miquel, and Qian (2008) find that although resource exports to China can stimulate economic growth, they may also negatively affect human rights outcomes. Kennan (2010) further contends that Chinese engagement in Angola enabled the government to circumvent IMF-backed governance reforms that might have mitigated the resource curse.

Despite these critiques, African scholars such as Cheru (2013) emphasise that the global surge in demand for natural resources presents both risks and opportunities for African countries. China’s engagement should therefore not be understood solely as exploitative, but rather as a complex relationship of interdependence shaped by Africa’s infrastructure needs and China’s resource security objectives. In this sense, the R4I model emerged as a default cooperation mechanism, inspired by China’s own development experience, its competitive advantages in infrastructure delivery, and Africa’s receptiveness to resource-linked financing arrangements. Grounded in the principle of mutual benefit, China has consistently combined infrastructure finance with the expansion of Chinese commercial interests and the pursuit of long-term resource security goals.

### **1.1. Comparative Analysis of the Conceptualisation of “Resource” in China’s R4I Model in Cameroon, DRC, Guinea, Zambia and Zimbabwe**

China's Resource-for-Infrastructure (R4I) model conceptualises natural resources not merely as extractive assets, but as financial instruments that underpin infrastructure delivery. Across Cameroon, Democratic Republic of Congo (DRC), Guinea, Zambia and Zimbabwe, the "resource" is consistently framed as collateral, a repayment mechanism, or guaranteed revenue stream, rather than as a foundation for domestic industrialisation. This shared conceptual core shapes both the developmental promise and governance constraints of the model. The boxes below highlight how the Model is structured across the different countries:

#### **Box 1**

In **Cameroon**, resources—particularly iron ore—are conceptualised as strategic enablers of infrastructure monetisation, linking mining rights directly to energy and transport investments. The model is characterised by vertical integration, where Chinese firms simultaneously extract resources and construct infrastructure, ensuring privileged access to logistics corridors. While this accelerates delivery of power and transport assets critical to unlocking mineral potential, it embeds long-term dependency and weakens national control over strategic infrastructure and revenue streams.

#### **Box 2**

**Guinea** presents a more formalised resource-backed loan (RBL) conceptualisation, where mineral extraction rights function both as collateral and as the revenue source for repayment (Action Guinea Mines 2025). The framework agreement positions resources at the centre of a long-term (2017–2036) financing envelope, theoretically worth up to USD 20 billion. However, the opacity of contracts and the use of escrow mechanisms outside normal budgetary processes weaken accountability, limit civil society oversight, and heighten corruption risks. Resources thus enable access to large-scale finance while simultaneously eroding democratic economic governance controlled joint ventures.

### Box 3

In **Zambia**, resources—primarily copper—are conceptualised more indirectly. While not always explicitly pledged as collateral, mineral revenues underpin repayment capacity and investor confidence (PWYP Zambia 2025). Compared to DRC and Guinea, Zambia’s R4I arrangements are more project-based and smaller in scale, allowing relatively greater policy flexibility. Nonetheless, limited disclosure, tied procurement, and exposure to commodity price volatility still constrain fiscal transparency and long-term governance outcomes.

### Box 4

**Zimbabwe** illustrates a hybrid conceptualisation shaped by international isolation. Resources function both as collateral for infrastructure loans and as leverage for broader strategic partnerships, particularly in energy and transport. More recently, Chinese access to lithium and platinum has relied less on formal R4I contracts and more on private equity acquisitions, blurring the boundary between state-backed R4I and market-driven resource capture. This evolution deepens governance challenges, as resource control increasingly shifts outside public oversight frameworks.

### Box 5

In the **DRC**, the conceptualisation of resources reaches its most explicit financialisation. Copper and cobalt are embedded within a complex repayment architecture, as exemplified by the Sicomines agreement, where mining profits are prioritised for loan servicing before fiscal benefits accrue to the state (Afriwatch/CNPAV 2023, EITI-RDC 2022). Here, resources are treated as quasi-sovereign guarantees, insulating infrastructure finance from public budgets but simultaneously bypassing parliamentary scrutiny and broader public financial management systems. This constrains economic governance by concentrating decision-making power in executive-level agreements and Chinese-controlled joint ventures.

Comparatively, the R4I model conceptualises resources across all five countries as financial substitutes for weak fiscal capacity, enabling rapid infrastructure delivery. However, this framing systematically prioritises extraction and debt servicing over transparency, institutional strengthening, and domestic value addition. As a result, while R4I can enable short-term infrastructure gains, its prevailing conceptualisation of “resource” acts as a structural constraint on economic governance, unless embedded within stronger accountability, disclosure, and industrial policy frameworks.

## 2. Country-specific Case Studies

### 2.1. Cameroon: Mékin Hydroelectric Dam

Cameroon’s experience with the Chinese R4I model is illustrated by the Mékin Hydroelectric Dam, a 15 MW project on the Dja River financed through a concessional loan structure dominated by China Exim Bank (85%) with the Cameroonian state providing the remainder.

Construction and maintenance were entrusted to the China National Electric Engineering Corporation (CNEEC), reflecting a governance arrangement characterised by tied financing, contractor dominance, and limited domestic oversight.

**Table 1: Description of the Mékin Hydroelectric Dam**

CHARACTERISTICS	SPÉCIFICATIONS
Type of dam	Gravity dam and earthen dike
Height of the dam	15,2 m
Capacity of the reservoir	105 million of m3
Installed capacity	15 MW (20.000hp)
Number of turbines	04 turbines of 3,75 MW each
Estimated annual production	Approx. 100 GWH
Production voltage	63KV
Transmission voltage	110KV
Distribution voltage	30 KV

*Source: YPD R4I Report 2026*

Governance weaknesses were evident throughout the project lifecycle. Contracts were not publicly disclosed, environmental compliance was granted in violation of national law, and the dam was constructed without a full Environmental and Social Impact Assessment for its main components. Oversight institutions lacked technical capacity, with no effective hydrological monitoring or independent financial audits, reinforcing opacity and weakening state control. Indigenous communities, notably the Baka and Bagyéli, were excluded from resettlement and consultation processes, highlighting systematic marginalisation under accelerated implementation timelines.

Operationally, the dam underperformed. Commissioning was delayed by 18 months, and actual electricity generation reached only 75–80% of installed capacity due to design flaws and incomplete turbine installation. Maintenance dependence on the Chinese contractor, combined with weak skills transfer, entrenched long-term technological reliance and inflated public costs.

Socio-economically, while the dam marginally strengthened the Southern Interconnected Network, its broader development contribution remains limited. Ecological impacts were severe: over 45 km<sup>2</sup> of forest were submerged, including protected areas of the Dja Faunal Reserve, threatening biodiversity and UNESCO World Heritage status. Health risks increased due to stagnant water and rising malaria incidence, without adequate mitigation measures. These unaccounted externalities undermine the project’s net developmental value.

Overall, the Mékin case demonstrates how Cameroon’s R4I arrangement prioritised speed and access to finance over governance quality, environmental safeguards, and inclusive

development. Rather than catalysing sustainable growth, the model reinforced debt exposure, technological dependence, and institutional erosion, raising serious questions about long-term economic sovereignty and development effectiveness.

## 2.2. Democratic Republic of Congo: Sicominex and Busanga Hydropower

The China–DRC R4I agreement, formalised in 2008, represents one of the most ambitious resource-backed infrastructure deals globally. Anchored in the Sicominex joint venture, the model leveraged copper and cobalt resources to finance large-scale infrastructure. Governance arrangements were structured around state-to-state negotiations with Chinese policy banks and state-owned enterprises, but with limited transparency and weak accountability mechanisms.

Seventeen years later, the country has still not received half of the infrastructure, even though the mining project is in its tenth year of production. This situation creates confusion to the point that it is difficult to know whether the infrastructure is still on loan or is being directly financed by Sicominex’s funds.

**Table 2: List of infrastructure projects within the framework of the DRC-China R4I Convention**

No.	Label	Quantity
	<b>COMMUNICATION ROUTES</b>	
1.	Railway lines	
	To be constructed	1015Km
	Rehabilitated and modernised	2720Km
2.	Roads	
	To be tarred	3656Km
	Tarred roads to be rehabilitated	364Km
	Earth roads to be rehabilitated	2518Km
	Total	6538Km
3.	Airports	2
4.	Urban Roads	550Km
	Kinshasa	250
	Other towns	300
	<b>ENERGY</b>	
1.	Hydroelectric Power Plants	2
2.	Urban distribution networks	2
	Health Sector	
1.	Hospitals	
	Provincial hospitals with 150 beds	31
	City of Kinshasa	1
2.	Health Centres	
	Territorial health centres with 50 beds	50
	Centers for territories	145

	<b>EDUCATION</b>	
1.	Universities	2
2.	Construction and public works vocational training centers	To be identified
	<b>HOUSING</b>	
1.	Social housing in Kinshasa	2000
	Social housing in Provinces	3000

Source: EITI-DRC Report 2021

Implementation has been highly uneven. While mining projects progressed relatively faster, none of the assessed infrastructure obligations were either not fully or poorly executed, resulting in an overall completion rate below 50% (see Table 3 and figure 3).

**Table 3: Summary of the results of the evaluation of the execution of the SI CO-MINES obligations of the mining and infrastructure components**

Nature of Projects	Person/institution responsible	Number of projects	Executed	Partially executed	Non-executed	Rate of project full execution in %
Mining Projects	DRC State and Chinese Enterprise Group	17	11	3	3	64.1
Infrastructure Projects	DRC State and Chinese Enterprise Group	6	0	5	1	0
<b>Total</b>		<b>23</b>	<b>11</b>	<b>8</b>	<b>5</b>	<b>47.8</b>

Source: EITI-DRC Report 2021



Figure 3: State of some infrastructure completed and handed over in DRC

According to the data presented, only 11 of the 23 fully executed projects were linked to the mining component of the agreement, while none of the assessed infrastructure obligations were fully implemented. Among the partially fulfilled obligations, three related to mining and five to infrastructure. Of the five obligations that remained entirely unfulfilled, four were associated with the mining component and one with infrastructure. Although these figures reflect an overall slow pace of implementation under the Sino–DRC Agreement, they also highlight a pronounced imbalance between the execution of mining and infrastructure commitments.

Afrewatch notes that the most critical obligations under the agreement are precisely those that have been partially implemented or not implemented at all, particularly those falling under the Chinese counterpart’s responsibilities

Financial opacity is a defining challenge: discrepancies between reported disbursements and actual expenditures remain unexplained, contractual amendments were not disclosed, and audits identified overpricing and procedural violations. These gaps created fertile conditions for corruption and weakened public oversight.

The Busanga Hydroelectric Power Plant exemplifies governance failure within this framework. Although conceived as a strategic public asset with majority Congolese ownership, contractual deviations resulted in Chinese partners holding majority control despite the DRC bearing most financial and resource risks. The concession granted extensive land, water, and operational rights to the operating company without adequate compensation or legal publication, undermining constitutional principles of resource sovereignty.

Socio-economic contributions from the R4I model have been fragmented. Infrastructure delivery approximately USD 800 million out of the expected 3 billion has not translated into transformative development due to piecemeal implementation. Roads were built in isolated segments rather than functional corridors, railways were excluded, and priority projects often reflected political prestige rather than population needs. As a result, public perception remains that everyday livelihoods have not significantly improved.

Additionally, expectations of value addition, technology transfer, and domestic capacity building were largely unmet. Mining outputs remained low-value, slowing loan repayment and increasing long-term debt exposure, which exceeded USD 2.8 billion by 2018. Extensive tax exemptions further constrained fiscal revenues.

In sum, the DRC case shows that without transparency, strategic planning, and balanced ownership structures, the R4I model can undermine rather than enhance development, locking the country into debt, dependency, and limited developmental returns. The situation in the DRC shows that without good governance, the Chinese side will take advantage of this to promote the mining project, with the consequence that it is the money from mining production that is given as a loan to finance the infrastructure component.

### **2.3. Guinea: Bauxite-Backed Infrastructure Framework**

Guinea’s R4I framework agreement with China, signed in 2017, aimed to mobilise up to USD 20 billion over 20 years by leveraging bauxite resources to finance infrastructure. Governance

arrangements involved state-level coordination between Guinea's Presidential Investment Council and Chinese authorities, with repayment secured through revenues from Chinese-operated bauxite mines and an escrow account at the Central Bank

In practice, implementation has been selective and opaque. The initial commitments of the framework agreement cover a total of \$1.2 billion for four projects: the construction of the Coyah-Mamou-Dabola road, the Conakry urban road project, and the reconstruction projects for four regional universities.

Of the four projects, only two are major road projects—the Coyah–Mamou–Dabola national road and Conakry urban roads—were executed in the first phase. Environmental and social governance proved weak: the Environmental and Social Impact Study for the Coyah–Mamou–Dabola road was not validated by the competent authority, yet construction proceeded through classified forests, causing deforestation without rehabilitation.

Despite the challenges in Guinea, the country has a unique characteristic. In the initial phase, only two projects were completed before the mining project began. It's easy to see that in Guinea, infrastructure was built before the mining project even started. This would be a significant difference compared to the DRC.

This raises a fundamental and important question: why was infrastructure built in Guinea beforehand?

**Table 4: Table of Resource-Backed Loans in Guinea**

Loan amount	Date of award	Funded project	Condition of repayment (rate, duration, management fees, method)	Project Entities	Project guarantees	Refund amount in 2020	Amount remaining as of 31/12/2020
<b>328,927 millions EUR</b>	05/09/2018	Coyah-Mamou-Dabola road project	Duration of the loan; 15 years, including 4 years of grace period; interest rate; 2.5% management fees; 0.5% reimbursement method; Commitment account that receives mining revenues for debt repayment	The Central Bank that orders the ICBC account to pay the instalment	The guarantee on the mining revenues of Chalco, Henan China and is in line with the cost of the project	The repayment amount is 0 because the 2020 year is covered by the grace period	130, 533 millions EUR
<b>186,118 millions EUR</b>	05/09/2018	Conakry Urban Road Project	Duration of the loan; 15 years, including 4 years of grace period; interest rate 2.5%, management fees: 0.5%, repayment method; commitment account that receives mining revenues intended for debt repayment.	The Central Bank that orders the ICBC account to pay the instalment	The guarantee on the mining revenues of Chalco, Henan China and is in line with the cost of the project	The repayment amount is 0 because the 2020 year is covered by the grace period	35, 588 millions EUR

Source: Action Mines Guinee R4I Report 2026

Compensation mechanisms for affected communities were poorly documented and inconsistently applied. While some households received payments, others were displaced without *consent* or adequate compensation. Local authorities confirmed compensation occurred but lacked records, highlighting institutional weakness and accountability gaps. Labour governance was also problematic, with reports of low wages, unsafe working conditions, and non-compliance with national labour laws by Chinese contractors.

Despite these challenges, the projects delivered marginal socio-economic benefits. The reconstructed road improved national connectivity between coastal and interior regions, reduced travel time, and facilitated trade flows. Urban roadworks in Conakry eased congestion and improved mobility, contributing to short-term employment opportunities during construction.

However, negative externalities diluted these gains. Poor quality of infrastructure delivered, Forest fragmentation, increased road safety risks, inadequate drainage infrastructure, and the displacement of local economic centres undermined local development outcomes. Technology transfer and sustainable capacity building were minimal, with Chinese firms dominating construction and logistics.



Fig1: Road eroded due to poor quality of delivery (AMG 2026)



Fig 2; House destroyed during road construction with inadequate compensation (AMG 2026)

Overall, Guinea’s R4I experience reflects a mixed development record: infrastructure delivery was achieved, but governance deficits particularly in environmental protection, community participation, and transparency significantly reduced the model’s inclusive and sustainable development potential.

#### 2.4. Zambia: Resource-Backed Infrastructure in a High-Debt Context

Zambia’s engagement with R4I financing emerged from persistent infrastructure deficits and limited access to conventional funding. Governance arrangements involve multiple state institutions alongside Chinese policy banks and contractors, but with restricted disclosure, limited parliamentary oversight, and tied procurement dominating implementation

R4I-linked projects focused on roads, energy, water and urban infrastructure (see table 5 below)

Table 5: R4I in Zambia

Sector	Infrastructure Project	Key partners/Contractors	Lender/Amount
Transport			
	Chinsali–Nakonde Road Rehabilitation Project	China Jiangxi Corporation for International Economic and Technical Cooperation	Export–Import Bank of China (360 Million)
	Lusaka–Ndola Dual Carriageway	Chinese state-owned enterprises	Chinese policy banks (concessional lending frameworks)
Energy			

	Kafue Gorge Lower Hydropower Project	Sinohydro; China Development Bank	China Development Bank
<b>Water</b>			
	Urban Water System Upgrades (selected cities)	Chinese contractors under concessional lending	Chinese concessional lenders
<b>Others</b>			
	Industrial Parks and Public Facilities Projects	Chinese SOEs and financiers	Chinese concessional and policy lenders

Source: Consultant, Based on PWYP Study on R4I projects in Zambia

Flagship initiatives such as the Chinsali–Nakonde Road and hydropower investments expanded connectivity and generation capacity, delivering visible development benefits including reduced transport costs, improved trade corridors, and enhanced electricity supply. These investments supported economic activity in strategic regions and contributed to industrial productivity.

Nevertheless, governance challenges remain central. Contractual opacity limits public scrutiny of repayment terms and fiscal risks, particularly in a context where external debt exceeded 120% of GDP by 2023. Heavy reliance on foreign-currency loans exposed Zambia to exchange-rate and commodity-price volatility, complicating debt sustainability. Tied financing constrained local contractor participation and weakened technology transfer, reducing long-term spillovers to domestic industries.

Socio-economic outcomes have been uneven. While infrastructure delivery improved national connectivity, benefits were concentrated in economically strategic zones, with rural areas remaining under-served. Employment creation was largely short-term, and local capacity building remained limited. Environmental and social safeguards were inconsistently applied, raising concerns about inclusivity.

In summary, Zambia’s R4I experience demonstrates the model’s capacity to deliver large-scale infrastructure quickly, but also highlights the risks of fiscal vulnerability, dependency, and weak governance when transparency and local content provisions are insufficient.

## 2.5. Zimbabwe: Platinum-Backed R4I and Governance Risks

Zimbabwe is one of the African resource rich countries that have received a significant share of resource backed loans from China across different sectors. Since 2000s, Beijing through the China Exim Bank, China Development Bank and other Chinese financial institutions have been handing out financial assistance to Zimbabwe in the form of grants, concessional and non-concessional loans and other financial and non-financial assistance (Moyo 2020). Having been isolated by Western countries and placed under economic sanctions, it was not surprisingly that Zimbabwe adopted a Look East Policy in 2003, which deepened economic, political and trade ties with China. The unintended effect of isolation of Zimbabwe from Western financial

institutions was to push it to rely on China for development finance resulting in the country contracting external loans on commercial terms that were collateralized by minerals exports and other natural resources. This Sino-Zimbabwe ties also grew stronger during the period when the country was isolated, resulting in the Former President Robert Mugabe formulating the Look East Policy.

Data from the China Africa Research Initiative of the Boston University shows that between 2002 and to date, Zimbabwe signed a total 28 loans with Chinese entities amounting to 3 billion. However, these figures could be conservative as some reports indicate that R4I only involving China and Zimbabwe could be more than \$6.8 billion (Mutondoro, et al. 2020). However, due to lack of contract transparency, and the opaque nature of most R4I deals, their real value is difficult to ascertain. However, what is known is that Chinese RBL for Zimbabwe cuts across different sectors that includes energy; transport sector agriculture sector, defense and military (2), water and sanitation and non-energy mining (China Africa Research Initiative of the Boston University, 2023). The table 1 below provides an overview of the loans contracted by Zimbabwe from China.

**Table 6: Chinese Loans to Zimbabwe from 2002 and 2023**

SECTOR	Infrastructure project	YEAR	AMOUNT (\$)	LENDER
<b>Energy</b>				
	Transformers, Cables, Switch Gears Phase 1	2003	22.0 million	China National Aero-Technology Import and Export Corporation (CATIC)
	Transmission Transformers	2004	40.0 million	China National Aero-Technology Import and Export Corporation (CATIC)
	Kariba South Hydropower Plants (300MW – concessional loan)	2013	159.8 million	CHEXIM
	Kariba South Hydropower Plant (300MW – Preferential Export Buyer’s Credit)	2013	159.8 million	CHEXIM
	Hwange Coal Plant Unit 7 & 8 (600MW)	2016	997.7 million	CHEXIM
<b>ICT</b>				
	NetOne Telecom Network Expansion, Phase 1	2010	42.3 million	CHEXIM
	NetOne Telecom Network, Expansion, Phase 2	2014	221.5 million	CHEXIM
	Supercomputer Center, University of Zimbabwe	2015	5.3 million	CIDCA
	NetOne Telecom Network Expansion, Phase 3	2019	67.3 million	CHEXIM
	TelOne Backbone Optic Fibre Network; Core and Access Network Modernization Project	2015	98.6 million	CHEXIM
<b>Transport</b>				

	MA60 Cargo Plane	2005	12 million	China National Aero-Technology Import and Export Corporation (CATIC)
	Bus Purchase	2008	18 million	Kimberley (Chinese Private Company)
	Victoria Falls Airport, Renovation	2012	162 million	CHEXIM
	Road Equipment for Rural District Councils Purchase	2013	9.7 million	CIDCA
	Robert Gabriel Mugabe International Airport, Harare, Upgrade	2018	157.8 million	CHEXIM
<b>Agriculture</b>				
	Purchase of Agricultural Equipment, Pesticides, Fertilizer, etc.	2006	200 million	CHEXIM
	Agricultural Machinery, Phase I	2006	25.1 million	CHEXIM
	Farmers World Loan Facility	2007	60.0 million	CHEXIM
<b>Military</b>				
	Purchase of K-8 Jet Trainer Aircraft (12 Units)	2006	150.0 million	China National Aero-Technology Import and Export Corporation (CATIC)
	National Defense College, Harare	2011	104.5 million	CHEXIM
<b>Water &amp; Sanitation</b>				
	City of Harare – Water Reticulation	2011	140.8 million	CHEXIM
<b>Health</b>				
	Medical Equipment and Medicine Purchase (5 Hospitals)	2011	89.9 million	CHEXIM

*Source: Consultant – based on China Africa Research Initiative of the Boston University*

Zimbabwe's attempted R4I platinum deal with China illustrates the political and governance risks embedded in resource-backed financing. The proposed 2009 agreement sought to exchange 50% equity in a vast platinum concession for USD 5 billion in concessional finance. Governance arrangements were highly centralised, negotiated at executive level without parliamentary approval or public participation

The deal faced severe challenges, including disputed mineral valuation, prior mortgaging of the concession, and strong opposition from senior officials who argued the arrangement heavily favoured China. Lack of transparency and internal government divisions ultimately caused the deal to collapse. More broadly, Zimbabwe's R4I engagements have been shaped by limited bargaining power, elite capture, and confidentiality clauses that restrict disclosure and parliamentary oversight.

Where R4I-linked projects materialised—such as energy generation and airport upgrades—socio-economic contributions were more tangible. The Hwange Thermal Power Plant expansion added 600 MW to the grid, significantly reducing power shortages, while airport

upgrades enhanced tourism and connectivity. These projects generated employment and improved infrastructure performance.

However, governance weaknesses persisted. Several deals were associated with inflated costs, quality concerns, and exclusion of communities from benefits. Constitutional amendments weakened parliamentary oversight of foreign loan agreements, further centralising power in the executive and undermining accountability.

Overall, Zimbabwe's case shows that while R4I can deliver critical infrastructure in constrained financing environments, weak governance, secrecy, and politicisation of resource deals severely limit equitable and sustainable development outcomes.

### 3. Cross-Country Synthesis Table: R4I Governance and Development Outcomes

Table 7: comparative analysis of R4I structuring and implementation across five study countries

Dimension / Country	Cameroon	DRC	Guinea	Zambia	Zimbabwe
<b>R4I Structure</b>	Exim Bank loan + Chinese EPC contractor (Mékin Dam)	Sicomines JV + resource-backed loans	Framework agreement backed by bauxite revenues	Concessional & commercial loans linked to minerals	Proposed equity-for-platinum + other RBLs
<b>Resource Nationalism (State Control over Resources &amp; Assets)</b>	<p>Weak: state ceded operational control; no skills transfer</p> <p>Share Capital = 7.5 billion FCFA.</p> <p>Evolution and Financial Situation</p> <p>Capital Increase: From 500,000,000 FCFA in 2022 to its current value of 7.5 billion FCFA, as recorded in the official documents of 2023 and 2024.</p> <p>Legal Status: Publicly Owned Company, held by the State of Cameroon.</p> <p>Project Financing: The total cost is approximately 25 billion FCFA, financed</p>	<p>Weak-eroding: loss of majority control</p> <p>Share capital = 50,000,000,000 Frs (USD 100,000,000) (Amendment 5)</p> <p><u>Category A Shareholders</u> GECAMINIES: USD 27,000 SIMCO SARL: USD 12,000</p> <p><u>Category B Shareholders</u> China Railway Group: USD 27,000 China Railway Resource Development LTD: USD 6,000 Zhejiang Huaya Cobalt Co. LTD: USD 5,000 Synohydro Corporation LTD: USD 26,000 Sinohydro Harbour Co. LTD: USD 4,000</p>	<p>Moderate: state retains ownership but weak enforcement.</p> <p>Share capital details not available</p> <p>Share Capital</p> <p>1-Chalco Company -85% owned by Chalco Hong Kong, while the Guinean state holds a 15% stake.</p> <p>2-SPIC -85% State Power Investment Corporation (SPIC), a Chinese state-owned energy conglomerate.</p> <p>-15% Guinean state</p> <p>3-CDM-China -85% Henan International Mining Development Corporation</p>	<p>Moderate: state ownership retained, fiscal exposure high</p> <p>Share capital details not available</p>	<p>Weak: proposed undervaluation of platinum; elite capture</p> <p>No share capital structure is disclosed. The Hwange Thermal Power Plant, built by Sinohydro with financing from Export-Import Bank of China, is loan-financed over 20 years from 2024, with Sinohydro operating it for six years. The tax regime offers reduced corporate tax, SEZ incentives, withholding tax exemptions, and duty rebates, potentially lowering Zimbabwe's mineral revenue capture.</p>

	primarily by China (approximately 90% via the Export-Import Bank of China).		-15% Guinean state		
<b>Debt Sustainability</b>	Hidden debt risks; underperforming asset	High risk: >USD 2.8bn outstanding; slow repayment	Medium risk: escrow mechanism but limited project delivery	High risk: debt >120% of GDP	High risk: opaque liabilities; intergenerational burden
<b>Transparency &amp; Accountability</b>	Very low: contracts unpublished; no audits	Very low: amendments undisclosed; data gaps	Low: compensation & ESIA undocumented	Low-moderate: contracts undisclosed; weak oversight	Very low: secrecy clauses; parliamentary bypass
<b>ESG Governance (Environment &amp; Social Safeguards)</b>	Severe violations (UNESCO site, Indigenous rights)	Weak safeguards; fragmented ESIA	Weak ESIA validation; deforestation	Inconsistent safeguards; rural exclusion	Weak community participation; militarised mining
<b>Infrastructure Performance</b>	Underperforming (75–80% capacity)	Fragmented, non-transformational	Roads delivered, but with design flaws	Roads & power largely functional	Some energy & airport successes
<b>Local Economic Spillovers</b>	Minimal; technological dependence	Minimal; low value addition	Short-term jobs only	Limited skills transfer	Uneven; concentrated benefits
<b>Overall Developmental Outcome</b>	Net negative	Low-negative	Mixed	Mixed	Mixed but governance-poor

Sources: Consultant compiled from reports from National Focal Points Cameroon (YPD) DRC (Afreview), Guinea (AMG), Zambia (PWYP), Zimbabwe (ZELO)

### **3.1. Overall Governance and Developmental Impacts in Cameroon, DRC, Guinea, Zambia and Zimbabwe**

Across Cameroon, the Democratic Republic of Congo (DRC), Guinea, Zambia and Zimbabwe, Resource-for-Infrastructure (R4I) arrangements with China have had mixed and often contradictory governance and developmental impacts. While these deals were framed as innovative mechanisms to fast-track infrastructure delivery without immediate fiscal pressure, evidence from the case studies suggests that weak governance environments have significantly constrained their developmental potential. In the DRC, the flagship Sino–Congolese agreement illustrates how ambitious infrastructure-for-minerals arrangements can translate into fragmented outcomes, with fewer than half of agreed projects fully executed and none of the assessed infrastructure obligations completed as planned. Similar governance weaknesses are evident in Cameroon’s Mékin Hydroelectric Dam, where accelerated implementation came at the expense of regulatory compliance and long-term performance, resulting in under-capacity power generation and sustained dependence on foreign operators.

In Guinea, the mining-for-infrastructure framework announced in 2017 promised transformative national development anchored in bauxite revenues. However, implementation has been narrowing in scope, with only a limited subset of road projects delivered and significant environmental and social costs externalised to local communities. Zambia presents a more ambivalent picture: R4I-linked projects have visibly expanded transport and energy infrastructure, yet these gains are offset by heightened debt vulnerability, limited transparency, and weak local capacity building. Zimbabwe’s experience, particularly the stalled platinum-for-infrastructure deal, highlights how political economy constraints, elite capture, and opaque negotiations can undermine national value capture and public accountability. Collectively, these cases demonstrate that R4I outcomes are shaped less by the model itself than by domestic governance capacity and institutional resilience.

#### **3.1.1. Transparency and Accountability of R4I Deals**

A defining characteristic across all five countries is the persistent lack of transparency and accountability in R4I negotiations, contracting, and implementation. In the DRC, access to information on financing flows, repayment schedules, and project-level expenditures remains extremely limited, with EITI-DRC reports providing only partial disclosure. Significant discrepancies between reported disbursements and actual expenditures—amounting to hundreds of millions of dollars—remain unexplained, creating fertile ground for corruption and illicit financial flows. The non-publication of key contractual amendments further weakens accountability and limits parliamentary and civil society oversight.

In Zimbabwe, confidentiality clauses embedded in Chinese resource-backed loans have systematically excluded Parliament and the public from scrutiny. The platinum R4I deal, negotiated at executive level, was never subjected to legislative approval or public consultation, despite its potential to transfer control over assets valued at tens of billions of dollars. Subsequent constitutional amendments further curtailed parliamentary oversight of foreign loan agreements, representing a significant institutional regression. Similar opacity characterises Cameroon’s Mékin Dam, where contracts were not published and no

independent financial audit was conducted, fuelling concerns over hidden debt and mismanagement. In Guinea and Zambia, while some project information is available, core contractual terms and valuation mechanisms remain inaccessible, undermining meaningful public accountability.

### **3.1.2. Institutional Capacity and Regulatory Oversight**

Weak institutional capacity and limited regulatory oversight are central to the governance failures observed in R4I implementation. In Cameroon, line ministries lacked the technical equipment and expertise necessary to monitor the environmental and operational performance of the Mékin Dam, resulting in regulatory breaches and poor project outcomes. The DRC case similarly reveals inadequate coordination between ministries and delayed submission of priority infrastructure lists, which contributed to uneven execution and weakened state bargaining power vis-à-vis Chinese partners.

In Guinea, environmental and social impact studies associated with major road projects were either not validated or ignored, reflecting weak enforcement of national regulations and marginalisation of oversight bodies. Zambia's institutional framework is comparatively stronger, yet still constrained by opaque contracting processes, limited parliamentary scrutiny, and insufficient integration of R4I obligations into medium-term fiscal planning. Zimbabwe represents the most extreme case, where executive dominance and political interference in licensing and contracting have hollowed out institutional checks and balances, leaving regulatory agencies unable to exercise effective oversight over resource-backed projects.

### **3.1.3. Implications for Public Participation and Community Rights**

Across the five countries, R4I projects have been characterised by weak public participation and frequent violations of community rights. In Cameroon, Indigenous communities such as the Baka and Bagyéli were excluded from resettlement planning and meaningful consultation during the Mékin Dam project, reflecting a deliberate political choice to prioritise speed over inclusivity. Guinea's road projects under the mining-for-infrastructure framework resulted in land expropriation, inadequate compensation, and the fragmentation of protected forests, with affected communities reporting opaque and insufficient redress mechanisms.

In the DRC, large-scale infrastructure and mining projects under the Sino–Congolese agreement has delivered limited tangible benefits to local populations, reinforcing perceptions that national resources are exchanged without commensurate improvements in livelihoods. Zambia's R4I-linked infrastructure has improved connectivity but has generated limited employment and technology transfer for local communities, while rural areas remain under-served. Zimbabwe's experience underscores how exclusionary decision-making and militarisation of extractive ventures can marginalise communities and concentrate benefits among political and military elites.

### **3.1.4. Environmental and Social Risks**

Environmental and social risks associated with R4I projects are significant and often inadequately managed. The Mékin Dam has caused extensive deforestation within and around a UNESCO World Heritage Site, biodiversity loss, and increased health risks due to stagnant

water and malaria proliferation. In Guinea, road construction has cut through classified forests, disrupted local economies, and generated long-term safety and drainage problems, with little evidence of rehabilitation or mitigation.

The DRC case highlights how weak enforcement of environmental and social safeguards accompanies large-scale extractive and infrastructure projects, contributing to fragmented development and long-term ecological degradation. Zambia's hydropower and road projects carry exposure to climate and exchange-rate risks, while social safeguards are inconsistently applied. In Zimbabwe, environmental and social risks are compounded by political interference and weak community engagement, heightening the potential for conflict and unsustainable resource exploitation.

## **4. Discussion**

### **4.1. R4I as an Enabler: Addressing Infrastructure Gaps and Resource Monetization**

R4I arrangements have, in some contexts, enabled governments to mobilise resources for infrastructure development that would otherwise have been unattainable. Zambia's experience demonstrates that resource-backed financing can accelerate delivery of strategic transport corridors and energy projects, contributing to regional trade integration and industrial productivity. Guinea's framework, despite its shortcomings, illustrates the potential of mineral revenues to support large-scale infrastructure investment when conventional financing is limited. These cases suggest that, under robust governance conditions, R4I could function as a tool for resource monetisation and infrastructure-led growth.

### **4.2. R4I as a Constraint: Governance Risks, Dependency and Lack of Transparency**

At the same time, the evidence overwhelmingly points to R4I as a constraint on sustainable development in weak institutional environments. Across all five countries, confidentiality clauses, executive-driven negotiations, and limited oversight have entrenched opacity and weakened accountability. Dependency on Chinese contractors and financiers has limited technology transfer and locked states into long-term maintenance and debt obligations, as seen most clearly in Cameroon and the DRC [\[filecite?turn1file4?turn1file3?\]](#). Zimbabwe's stalled platinum deal further illustrates how undervaluation of resources and elite capture can undermine national sovereignty and long-term development prospects.

### **4.3. Long-Term Sustainability Implications for Transitional Minerals, Infrastructure and Development**

In the context of growing global demand for transitional minerals, the long-term sustainability implications of R4I arrangements are profound. Without stronger governance frameworks, these deals risk reproducing extractive dependency, fiscal vulnerability, and environmental degradation rather than supporting diversified and inclusive development. The cases of Cameroon, DRC, Guinea, Zambia and Zimbabwe collectively suggest that R4I can only contribute to sustainable exploitation of transitional minerals if accompanied by transparent contracting, robust regulatory oversight, meaningful public participation, and enforceable environmental and social safeguards. Absent these conditions, R4I is more likely to entrench

dependency, weaken institutions, and compromise the developmental promise of Africa's mineral wealth

## **5. Contrasting the R4I model with Western donor-led models**

This section examines how the Chinese Resource-for-Infrastructure (R4I) financing model compares with Western donor-led infrastructure financing approaches, focusing on their underlying logics, implementation modalities, and developmental implications. Over the past two decades, the Chinese R4I model has emerged as a prominent alternative source of infrastructure finance for developing countries, particularly in resource-rich contexts facing significant infrastructure deficits. At its core, the R4I model is premised on an infrastructure-first development logic, whereby access to natural resources—explicitly or implicitly—is leveraged to secure financing for large-scale infrastructure projects. This approach prioritises rapid project delivery, flexibility in loan structuring, and limited political conditionality.

By contrast, Western financing models, typically channelled through multilateral development banks and bilateral donors, emphasise macroeconomic stability, debt sustainability, transparency, and institutional reform. These models are characterised by extensive project appraisal processes, competitive procurement requirements, environmental and social safeguards, and governance-related conditionalities. While such frameworks are designed to promote accountability and long-term sustainability, they are often criticised for slow disbursement, rigid conditionalities, and limited responsiveness to urgent infrastructure needs.

The comparison between these models therefore reveals a fundamental trade-off. Chinese R4I arrangements can accelerate infrastructure provision and address immediate development gaps, but frequently raise concerns related to transparency, environmental and social risk management, debt exposure, and local value capture. Western models, on the other hand, offer stronger safeguards and accountability mechanisms, yet may constrain access to finance where institutional capacity is weak or political conditions are contested. Understanding these differences is essential for assessing how infrastructure financing choices shape development outcomes, fiscal risks, and governance trajectories across developing economies.

Table 8 below compares China-style R4I vs Western donor-led models. While this comparison is done in this study, it does not imply that the Western models are better structured nor have contributed to the transformational development of African countries where they have been applied.

**Table 8: Comparative table of R4I and Western Models**

<b>Dimension</b>	<b>China-style R4I (as seen in Cameroon, DRC, Guinea, Zambia, Zimbabwe)</b>	<b>Western donor-led models (World Bank, AfDB, bilateral aid)</b>
<b>Core financing logic</b>	Resource-collateralised or resource-adjacent finance (explicit or implicit), often framed as “infrastructure now, repay later via minerals/resource revenues.” In practice: mineral production/performance becomes central to repayment, increasing sensitivity to commodity cycles.	Typically sovereign loans/grants (concessional or non-concessional) based on macro-fiscal assessments; not usually collateralised by specific mineral streams. Debt decisions guided by the IMF–World Bank LIC Debt Sustainability Framework (DSF).
<b>Speed and “delivery” narrative</b>	Often marketed as fast-track infrastructure; however, cases show delays, partial delivery, or uneven execution (e.g., DRC’s imbalance between mining vs infrastructure commitments; Cameroon’s delayed commissioning and underperformance).	Project timelines can be slower due to appraisal, safeguards, procurement rules; but designed around risk management, disclosure, and supervision over the project life cycle. World Bank ESF emphasizes ongoing consultation and disclosure. Very often the consultations are a tick the box exercise and do not consider the voice and position of the host countries.
<b>Transparency and disclosure</b>	Consistently opaque contracting and implementation: confidentiality/non-disclosure patterns; limited public access to contract terms and amendments; weak public reporting (DRC discrepancies; Zimbabwe executive-level secrecy).	Formal disclosure regimes: World Bank Access to Information and routine disclosure of key project documents; AfDB disclosure platforms for environmental/social assessment.
<b>Procurement model</b>	Frequently tied (contracting concentrated among Chinese SOEs/contractors), limiting competitive tendering and local firm participation; local content outcomes depend heavily on domestic enforcement.	Procurement rules emphasize competition and transparency: World Bank procurement regulations explicitly include transparency and integrity principles; AfDB procurement policy similarly emphasizes open/competitive bidding and equal opportunity.
<b>Safeguards (environmental &amp; social)</b>	Pattern of safeguards circumvention or weak enforcement in the case studies (Cameroon: no detailed ESIA for key components; Guinea: ESIA not validated; community exclusions).	World Bank ESF and AfDB safeguards require risk classification, impact assessment, disclosure, stakeholder engagement, and grievance mechanisms as part of good practice.

<b>Stakeholder engagement &amp; participation</b>	Often limited or procedural: exclusion of Indigenous groups (Cameroon), weak or opaque compensation (Guinea), limited public participation in deal-making (Zimbabwe).	World Bank ESS10 explicitly requires stakeholder engagement and information disclosure throughout the project life cycle. AfDB safeguards similarly embed consultation and disclosure expectations
<b>Accountability and grievance redress</b>	Oversight tends to be domestically constrained where institutions are weak; in Zimbabwe, legal changes reduced parliamentary approval power for certain foreign loan agreements, weakening checks and balances.	Banks have formal accountability pathways (e.g., disclosure frameworks and structured grievance approaches within safeguards systems); procurement complaints handling is standardised in AfDB guidance.
<b>Institutional capacity-building</b>	Evidence of limited technology transfer and capacity-building, with ongoing dependence on external operators (Cameroon's operation/maintenance dependency; DRC's weak local participation).	ESF explicitly emphasizes strengthening borrower systems and capacity; donor projects often include TA components, although effectiveness varies by context.
<b>Debt and repayment risk allocation</b>	Risk often shifts to the host state via commodity-price exposure, production shortfalls, and opaque refinancing/renegotiation; DRC's repayment depends on mining output and value addition; Zambia faces high debt vulnerability in an R4I-heavy environment	LIC-DSF is designed to align borrowing with repayment capacity and mitigate debt distress; donors generally integrate DSA into lending decisions and policy dialogue.
<b>Contract secrecy norms</b>	Research on Chinese lending documents restrictive confidentiality clauses, constraining public scrutiny and sometimes even acknowledging the debt.	Western IFIs and many bilateral donors operate under public disclosure norms (ATI, IATI, Access to Information), though bilateral transparency varies by donor.
<b>Developmental "fit" and prioritisation</b>	Risk of misaligned infrastructure priorities (DRC: dilution away from transformational corridors; "prestige/fragmented" outcomes) and uneven developmental impact.	Stronger emphasis on economic appraisal, results frameworks, and ex ante justification; still subject to political economy pressures, but project documentation and evaluation are typically disclosed
<b>Local distribution of benefits</b>	Benefits can be visible but uneven: Zambia's corridors and energy gains alongside weak local spillovers; Zimbabwe's deals risk elite capture; Guinea and Cameroon show community-level costs without adequate redress.	Donor models typically mandate social risk management and inclusion measures; effectiveness varies, but institutional requirements for consultation and disclosure strengthen contestability.

Source: Consultant, compiled with inputs from Cameroon, DRC, Guinea, Zambia and Zimbabwe Chinese R4I Studies

## 6. Conclusion and Policy recommendations

Across Cameroon, the Democratic Republic of Congo (DRC), Guinea, Zambia and Zimbabwe, the experience of China's Resource-for-Infrastructure (R4I) model reveals a consistent gap between developmental ambition and governance reality. While R4I arrangements have enabled access to capital for infrastructure development in contexts of constrained fiscal space and limited access to traditional financing, their implementation has been marked by systemic governance failures, weak transparency, and limited long-term developmental transformation.

In all five countries, R4I projects have delivered visible infrastructure outputs roads, energy facilities, airports, and public buildings that would likely not have materialised in the short term through domestic resources alone. Zambia and Zimbabwe illustrate that such investments can contribute to improved connectivity, energy supply, employment creation, and export capacity, while Guinea's mining-for-infrastructure framework demonstrates how resource wealth linked to the global energy transition can be mobilised to address long-standing infrastructure deficits.

However, these benefits have been significantly undermined by opaque contracting, fragmented project selection, weak institutional oversight, and poor alignment with national development strategies. The DRC's Sicominex agreement stands as the most comprehensive illustration of how R4I can constrain rather than enable development when embedded in fragile governance systems. There, infrastructure delivery was partial, geographically scattered, and misaligned with strategic priorities, while financial discrepancies and undisclosed amendments eroded fiscal sovereignty and public trust

Cameroon and Guinea further demonstrate how the circumvention of environmental and social safeguards—particularly the failure to conduct or validate environmental and social impact assessments and the exclusion of affected communities—creates lasting ecological damage, social grievances, and legitimacy deficits that outweigh short-term infrastructure gains. Zimbabwe's experience highlights how prolonged dependence on Chinese financing, combined with weakened parliamentary oversight, increases debt vulnerability and narrows policy autonomy.

A critical cross-cutting finding is that R4I has generally failed to build domestic capacity, promote technology transfer, or catalyse structural economic transformation. Instead of strengthening national planning, procurement, and regulatory institutions, R4I arrangements have often bypassed them, reinforcing dependence on external actors and limiting learning effects. This pattern risks reproducing extractive governance models in a new guise, particularly as African countries seek to leverage transitional and critical minerals for the green transition.

The evidence across the five countries therefore suggests that R4I is not inherently flawed, but highly contingent on governance conditions, bargaining power, and accountability mechanisms. Without robust safeguards, R4I arrangements risk entrenching fiscal leakage, environmental harm, and elite capture rather than supporting inclusive and sustainable development.

## **6.1. Coss-Cutting Policy Recommendations for Joint Advocacy**

### **6.1.1, For the governments of Cameroon, DRC, Guinea, Zambia and Zimbabwe**

Governments should place governance reform at the centre of any current or future R4I arrangements. This begins with the mandatory public disclosure of all R4I contracts, annexes, amendments, and repayment schedules, treating such agreements as public-interest instruments rather than confidential executive deals. Parliamentary ratification should be required for all R4I agreements that impose fiscal obligations, restoring legislative oversight where it has been weakened and reinforcing checks and balances.

R4I commitments must be fully integrated into national debt management frameworks, including the recording of contingent liabilities and exposure to commodity price volatility. Independent audits by supreme audit institutions should be routine and published. Project selection should be aligned with national development plans and prioritise high-impact economic corridors and social infrastructure rather than politically visible or fragmented projects, as repeatedly observed in the DRC and Zimbabwe cases.

Governments should also mandate binding local content, technology transfer, and skills development clauses, with independent verification mechanisms. Environmental and social safeguards including validated ESIA, community consultation, and benefit-sharing agreements must be non-negotiable preconditions for project approval, particularly in ecologically sensitive and resource-rich regions.

### **6.1.2. For China and Chinese Financial and Corporate Actors**

China should reposition R4I as a credible development partnership by moving from voluntary guidelines to enforceable overseas ESG standards. This includes allowing and encouraging borrower governments to disclose contracts, strengthening anti-corruption provisions, and ensuring meaningful community consultation and grievance mechanisms.

Chinese financiers and contractors should institutionalise local capacity-building and value-chain development, supporting beneficiation, processing, and downstream industries linked to transitional minerals. Transparent reporting on project costs, timelines, and performance would enhance trust and counter perceptions of exploitative or asymmetric arrangements.

China must respect the terms of the Joint Venture it has signed with the Congolese State especially the disbursement of 7 000 000 000 USD for the development of agreed infrastructure before the mines start to produce

### **6.1.3. For Civil Society, Regional Bodies, and International Partners**

Civil society organisations, media, and local communities should be supported to conduct systematic monitoring and “citizen audits” of R4I projects, translating complex contracts into accessible public information. Regional bodies and development partners should promote harmonised minimum standards for resource-backed financing across Africa, including transparency, procurement integrity, and safeguard compliance.

International financial institutions and regional development banks can play a critical role by providing a governance floor offering technical assistance on disclosure, debt transparency, and safeguards even when they are not direct financiers.

In sum, the collective experience of Cameroon, DRC, Guinea, Zambia and Zimbabwe shows that the future of R4I in Africa and its relevance to the continent's green transition depends not on the financing model itself, but on whether it is embedded in transparent, accountable, and development-oriented governance systems. These cross-cutting reforms provide a shared platform for joint advocacy aimed at transforming R4I from a tool of extraction and dependency into a genuine lever for sustainable and inclusive development.

## References

Afrewatch/CNPAV 2024, Rapport Réalisation des Infrastructures Sicomines : Un Marché De Dupes ou une Opportunité Manquée, <https://afrewatch.org/wp-content/uploads/2025/05/RAPPORT-AFREWATCH>

African Natural Resources Centre (ANRC). (2022). *African Green Minerals Strategy*. Addis Ababa: African Union Development Agency.

African Union. (2009). *African Mining Vision*. Addis Ababa: African Union Commission.

Afrique24 TV. (2025). *China–Africa economic relations and Chinese investment trends in Central Africa*. Paris.

Alden, C. (2007). *China in Africa*. London: Zed Books.

Brautigam, D. (2009). *The Dragon's Gift: The Real Story of China in Africa*. Oxford: Oxford University Press.

Brautigam, D. (2011). Aid 'with Chinese characteristics': Chinese foreign aid and development finance meet the OECD-DAC aid regime. *Journal of International Development*, 23(5), 752–764.

Butts, K. H., & Bankus, B. (2009). China's pursuit of Africa's natural resources. *U.S. Army War College Strategic Studies Institute*.

Chang, H.-J., Andreoni, A., & Kuan, M. L. (2016). *International industrial policy experiences and the lessons for Africa*. *Journal of African Economies*, 25(S2), ii15–ii41.

Cheru, F. (2013). *African renaissance: Roadmaps to the challenge of globalization*. London: Zed Books.

China Africa Research Initiative of the Boston University; Available at: <https://www.bu.edu/gdp/chinese-loans-to-africa-database/>

Egbula, M., & Zheng, Q. (2011). China and Africa: A new approach to development cooperation. *Policy Research Paper*, SAIS-CARI.

EITI-RDC 2021, Etude d'évaluation de la mise en œuvre de la convention de collaboration relative au développement d'un projet minier et d'un projet d'infrastructures en RD Congo Projet SICOMINES

Farai Mutondoro, et al (2020) Resource-backed loans, COVID-19 and the high risk of debt trap: A case study of Zimbabwe, Available at; [https://www.pulp.up.ac.za/images/edocman/edited-collections/sadc\\_book/2021%20SADC%20Debt%20Chapter%2013.pdf](https://www.pulp.up.ac.za/images/edocman/edited-collections/sadc_book/2021%20SADC%20Debt%20Chapter%2013.pdf)

Finocchi, E., & Finocchi, F. (2025). China's Resource-Backed Debt Model for Africa: The Cases of DRC, Kenya, and Zimbabwe. *Open Journal of Business and Management*, 13, 2304-2326. <https://doi.org/10.4236/ojbm.2025.133119>

IMF & World Bank. (2020). *Collateralized transactions: Key policy considerations*. Washington, DC.

International Energy Agency (IEA). (2023). *The Role of Critical Minerals in Clean Energy Transitions*. Paris: IEA.

Kelley, J. (2010). Who keeps international commitments and why? *American Political Science Review*, 104(3), 573–589.

Ministry of mines (CTPM) DRC, Amendment No. 5 to the Collaboration Agreement Relating to the Development of a Mining Project and an Infrastructure Project in the Democratic Republic of Congo, dated April 22, 2008 <https://datawarehouse.ctcpm.cd/emine/cadre/juridique/contrat/principal/contrat/relatif/5/tc>

Meyersson, E., Padró i Miquel, G., & Qian, N. (2008). The rise of China and the natural resource curse in Africa. *World Bank Policy Research Working Paper*.

Mihalyi, D., 2022. *Resource-backed loans: pitfalls and potential*. Natural Resource Governance Institute

Moyo Gordon (2020) Chinese Development Finance to Africa and the Spectre of Debt Distress, in Samuel Oloruntoba (ed) (2020). 1<sup>st</sup> Edition. The Palgrave Handbook of African Political Economy, Springer International Publishing

Natural Resource Governance Institute (NRGI). (2020). *Resource-backed loans: Risks and rewards*.

Natural Resource Governance Institute (NRGI). (2024). *Transition Minerals and Development Prospects in Africa*. New York: NRGI.

Publish What You Pay (PWYP). (2023). *Transparency and governance gaps in Africa's transition minerals sector*. London: PWYP Coalition.

UNESCO. (2020). *Assessment of the impacts of the activities of the Mékin hydroelectric dam on the Outstanding Universal Value of the Dja Wildlife Reserve*. Paris: UNESCO World Heritage Centre.

Vizcarra, Catalina 2009, "Guano, Credible Commitments and State Finances in Nineteenth Century Peru." *The Journal of Economic History*. Vol. 69, no. 2.

Wang, W., Ning, Z., Shu, Y., Riti, J.S. and Riti, M.K.J., 2023. Natural resource rents and public debts nexus in African resource-rich and most indebted nations: Issues with aggregation bias. *Resources Policy*, 82,

Zimbabwe Environmental Law Association (2023), Situational Report, Implications of the Lithium Mining Rush in Zimbabwe: Analysis of Legal Developments; <https://zela.org/download/map-of-lithium-exploration-and-mining-projects-in-zimbabwe-2/>

## **Annexes**

Report - Cameroon

Report - DRC

Report - Guinea

Report - Zambia

Report - Zimbabwe