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Chinese Trade and Investment and Local Enterprise Development in Sierra Leone: Trade Concentration, Investment Measurement, and Sectoral Evidence

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Abstract

This study examines how Chinese trade and foreign direct investment condition local enterprise development in Sierra Leone. It uses a quantitative secondary-data design. The data cover bilateral trade from 2018 to 2025, three competing measures of Chinese investment, and two sector cases: iron-ore mining and rice-technology cooperation. Trade rose from about US$505 million to US$2.3 billion, a compound annual growth rate of 24 percent. Iron ore supplied 87 percent of exports to China in 2023 and more than all of the growth between 2022 and 2023. Estimates of Chinese investment range from US$0.09 billion to US$6.4 billion, a seventy-fold gap. In mining, government receipts equalled 5.3 percent of mineral export value, and 93 percent of recorded jobs went to Sierra Leoneans. In agriculture, demonstration yields reached 2.1 to 9.0 tonnes per hectare against a national average of 2.1, yet promotion covered only 0.1 percent of rice land. Developmental returns depend less on the volume of Chinese capital than on local content enforcement, fiscal capture, and the scale of technology diffusion. The study offers measurable indicators for policy and sets priorities for firm-level research.

Keywords: *China–Africa Relations, Sierra Leone, Foreign Direct Investment, Local Enterprise Development, Trade Concentration, Technology Transfer, Case Analysis.*

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1. Introduction

The relationship between China and Africa has changed a great deal over the past two decades. China has become Africa's largest trading partner and a major source of foreign direct investment (Calabrese, 2023). Sierra Leone, a resource-rich West African economy, is an increasingly significant partner. China has been Sierra Leone's largest trading partner for many years, and bilateral trade reached a record 16.32 billion yuan in 2025 (Embassy of the People's Republic of China in Sierra Leone, 2026). That equals about US$2.3 billion and nearly 30 percent above 2024, with Sierra Leonean exports to China growing by more than 40 percent (Xinhua, 2026). The Chinese ambassador reported that bilateral trade rose a further 38 percent in the first half of

2026. He attributed this partly to China's zero-tariff treatment of Sierra Leonean products. Several developments show the pace of engagement. The fifth Chinese Chamber of Commerce in Sierra Leone was inaugurated in October 2025, bringing together seventeen Chinese enterprises. The Vice President, Dr Mohamed Juldeh Jalloh, described the event as a revitalisation of bilateral trade, development, and investment. From 1 May 2026 China extended zero-tariff treatment to the 53 African countries with which it has diplomatic relations. Discussions are under way to widen Sierra Leonean export access beyond fishing products to palm oil, coffee, and cocoa. At head-of-state level, President Xi Jinping pledged in February 2024 to encourage Chinese firms to invest in Sierra Leone (Reuters, 2024). The ties are not new. Diplomatic relations began in 1971, and the Chinese community has grown from a handful of technical assistance personnel into contractors, miners, traders, medical professionals, and entrepreneurs whose work now touches nearly every sector of the economy (Conteh & Conteh, 2026). Despite this engagement, a critical gap persists. Macro-level analyses of Sino-African economic relations are abundant, yet micro-level studies of effects on local businesses, entrepreneurs, and communities remain scarce. Eleveld and Pennink (2021) observe that little is known about the effects of China's investment surge on developing countries. Dike and Owusu (2024) call for stronger quantitative and evidence-based qualitative support. Calabrese (2023) finds that Chinese trade generates mixed effects, while Chinese investment and infrastructure construction tend to contribute positively to structural transformation. Local content and benefit distribution remain contested. Conteh and Conteh (2026) add that scholarship has focused on large states such as Ethiopia, Zambia, and Angola, which leaves small post-conflict economies underexamined. Sierra Leone is one of these economies.

The central problem addressed here is the limited quantified understanding of how Chinese trade and investment shape local enterprise development in Sierra Leone. Two features of the evidence base make quantification both necessary and difficult. First, the headline statistics are not mutually consistent. Recorded Chinese FDI stock, official cumulative-investment claims, and tracker-based estimates differ by orders of magnitude. Such disagreement is not unique to Sierra Leone. Studies of Chinese firms across Africa rely on varied databases, and some claims rest on unconvincing evidence (Luo & Chen, 2024; Oya & Schaefer, 2023). Second, sector-level outcomes, such as fiscal capture, local employment, and yield gains, are rarely set beside the trade and investment aggregates. This paper therefore combines aggregate trade analysis with an explicit reconciliation of investment data and two structured case analyses. The novelty of the study lies in this combination. It grades sources by reliability, decomposes trade growth by product, reconciles three lenses on Chinese investment, and pairs a capital-intensive mining case with a knowledge-intensive agricultural case. The study matters for two reasons. It gives policymakers measurable indicators of fiscal capture, local employment, and diffusion. It also shows where evidence is missing, which sets priorities for primary research. The primary research question is how patterns of Chinese trade and investment affect local enterprise development in Sierra Leone, and which institutional and sectoral factors shape the outcomes. Four secondary questions guide the analysis. (i) What are the trends and patterns of trade and investment, and how concentrated are they? (ii) How do local entrepreneurs perceive Chinese economic influence? (iii) What role do local content policy, investment regulation, and trade policy play in mediating the impact of Chinese investment? (iv) What are the mechanisms, scale, and constraints of technology transfer and local capacity building in Chinese-invested sectors?

2. Literature Review

Dike and Owusu (2024) provide a systematic review of China–Africa ties published between 2000 and 2022. They conclude that China's presence is driven primarily by economic and political motives, with loans, grants, and infrastructure-for-resources arrangements as the principal instruments. The literature is divided between those who characterise Chinese engagement as self-interested resource extraction and those who regard it as a potential contributor to African advancement. Calabrese (2023), synthesising more than one hundred sources, finds a generally positive association between Chinese investment and infrastructure construction and African

economic transformation. Trade effects remain mixed, and concerns persist over debt sustainability and the concentration of benefits among Chinese stakeholders and local elites. Zajontz (2023) situates Chinese infrastructure financing within a political economy of capital, state agency, and debt. He cautions that infrastructure-led engagement can deepen fiscal exposure. Conteh and Conteh (2026) show that Chinese contributions in Sierra Leone are substantial, covering infrastructure, mineral and fisheries investment, employment, health support, and crisis response. They also record labour disputes, environmental damage, weak local linkages, tax compliance gaps, and thin technology transfer. At country level, Eleveld and Pennink (2021) focus on Sierra Leone and treat local entrepreneurs as keystone actors in local innovation and development. Their interview-based research documents convergent and divergent perceptions of Chinese engagement among Freetown-based entrepreneurs. It remains one of few micro-level, locally grounded studies. Investment-tracking sources indicate that Chinese investment in Sierra Leone is concentrated in metals and extractives (Reuters, 2024), while UNCTAD data place total FDI stock at roughly US$3 billion in 2023 (Germany Trade & Invest, 2025). Coface (2026) identifies China as the largest provider of FDI in the country, mainly in mining. Wage evidence shows why careful comparison matters. Oya and Schaefer (2023) draw on more than 1,400 worker-level interviews in Angola and Ethiopia. They find that Chinese firms do not consistently pay less than comparable firms. National origin alone cannot explain the differences. Worker characteristics, sector specificities, and firm attributes all matter.

Research on investment motives and finance adds another layer. Yuan and Ji (2025) analyse Chinese outward FDI across African states between 2003 and 2022. They find market-seeking and efficiency-seeking motives, weaker resource-seeking and strategic-asset-seeking motives, and an institutional-quality moderation effect up to a tipping point. They also find that the Belt and Road Initiative has no obvious influence on Chinese investment in Africa. Mohamued et al. (2024) use 14 years of data from 42 African countries. They report that comparable institutional characteristics between host and home countries have a significant positive effect on Chinese outward FDI. Luo and Chen (2024) argue that experience gained in incomplete home markets helps Chinese enterprises invest in weak market environments. They match many databases and use the government work experience of executives as a proxy. Xia and Chen (2023) show that China's development-oriented equity funds channel state-related resources to private firms. Stateness also creates adverse selection, which stops funds from choosing the most promising projects. Brazys and Jung (2024) find that local aid boosts local FDI, and that Chinese FDI follows World Bank aid as well as Chinese aid. The Chinese pattern is therefore not exceptional among donors. Fambo and Ge (2025) study 41 African countries and find a negative impact of Chinese OFDI on growth overall. Yet OFDI can support growth through export diversification, and partnerships between African and Chinese firms can open routes to innovation and technology transfer.

Agricultural cooperation offers some of the clearest documented evidence of technology transfer. Chinese-supported rice projects operated in Liberia, Sierra Leone, and The Gambia as early as the 1970s and 1980s (Brautigam, 1987). In Sierra Leone, cooperation continues through the fourteenth Chinese agricultural technical expert group. It works alongside the Government's Feed Salone initiative, with hybrid rice cultivation, irrigated greenhouses, and demonstration bases (Science and Technology Daily, 2026). Lin and Cui (2024) provide continental evidence. They treat the Chinese Agriculture Technology Demonstration Center as a quasi-natural experiment, and they find higher crop production and improved trade dependence. Continental econometric work also shows Chinese FDI in African agriculture growing from under US$75 million in 2003 to nearly US$5 billion by 2021, with about two-thirds concentrated in a small number of host countries. In Côte d'Ivoire, farmer yields under the West Africa Rice Value Chain Project rose from 0.8 to 2.2 tonnes per hectare while post-harvest losses fell from 25 to 10 percent. This case is used below as a regional comparator. The mining literature is less encouraging on local linkage. Muhirwa et al. (2023) review large extractive investments in Africa between 2000 and 2022. They find that the offer of extractive industries to communities is still low, and in some places it is

declining as technology advances. Government plans to develop local value around mining sites have been ignored for many years. Sändig et al. (2024) examine Chinese mining projects in Guinea and the Democratic Republic of the Congo. Chinese companies concede under conditions similar to those that move other companies: recurrent disruptive action, pressure from state actors and NGOs, and reputational concern. Yu and Wang (2023) study mineral trade between China and ten African Great Lakes economies from 2010 to 2021. Distance hampers sustainable trade, and trade uncertainty poses challenges. Birhanu et al. (2016) offer a firm-level reminder about weak governance. Using data from Africa and Latin America, they find that bribe payments deter investment in fixed assets, and short-term oriented firms prefer to bribe rather than invest.

The study draws on three theoretical perspectives. Institutional theory, following North (1990), examines how formal institutions (laws, regulations, policy) and informal institutions (norms, practice) shape the behaviour of Chinese investors and local entrepreneurs. Particular attention is given to local content policy, labour law, and the Finance Act, as reflected in the Vice President's address to the Chinese Chamber of Commerce. Second, technology-transfer and innovation-systems theory conceptualise transfer as a multidimensional process spanning equipment, organisational forms, management practice, and knowledge systems. Agricultural demonstration farms and training centres illustrate it in practice. Third, agency–structure theory recognises that China–Africa relations are characterised by dynamism and African agency, with local actors exercising meaningful agency within structural constraints. This view is reinforced by the institutionally grounded account in Dike and Owusu (2024). Work on technology transfer suggests that political alignment can reduce institutional friction, although distributional benefits for local firms depend on absorptive capacity and regulatory enforcement. Conteh and Conteh (2026) reach a similar view. Their framework links Chinese community activity to structural transformation through investment, employment, infrastructure, technology, human capital, trade, and institutional capacity, conditioned by governance quality and absorptive capacity. Taken together, the literature shows a gap between well-publicised macro-level trade and investment statistics and thin micro-level evidence on local enterprise development. This paper contributes by assembling and reconciling the available quantitative series. It also tests three propositions and pairs the aggregates with two structured sector cases, within an explicit institutional and innovation-systems framework.

3. Proposition Development

Trade between Sierra Leone and China has expanded since diplomatic relations began in 1971. Conteh and Conteh (2026) show that Chinese community activity now touches nearly every sector of the national economy, including mining, fisheries, construction, health, and trade. Yet the export side of that relationship remains narrow. Mineral and fisheries investment dominate the recorded flows, while manufacturing and processed exports remain limited (Conteh & Conteh, 2026). Yu and Wang (2023) examine mineral resource trade between China and ten African Great Lakes economies. They find that geographical distance hampers sustainable trade and that trade uncertainty poses challenges. Per capita income equality positively affects the sustainable trade index, and a rise in China's yuan lowers the sustainable development index (Yu & Wang, 2023). These findings point to structural and macroeconomic conditions that keep mineral trade concentrated. Fambo and Ge (2025) add that export diversification is the channel through which Chinese OFDI can support growth. Their evidence from 41 African countries suggests that diversified economies have a stronger capacity to grow. Muhirwa et al. (2023) note that government plans to develop local value and diversify economic sources around mining sites have often been ignored. The combined evidence implies that trade growth in mineral-rich, post-conflict economies follows commodity extraction rather than broad diversification. Therefore, the following proposition has been developed:

P1 (concentration): *Growth in Sino-Sierra Leonean trade is driven mainly by a single extractive commodity rather than by broad-based export diversification.*

Estimates of Chinese investment in Africa vary widely across sources. The variation reflects differences in definition, coverage, and data source rather than only real differences in flows.

Conteh and Conteh (2026) combine documentary analysis of government, Chinese, and multilateral sources with secondary statistics and institutional analysis. Their design acknowledges that no single source captures Chinese community activity in full. Xia and Chen (2023) show that official development-oriented finance operates through equity investment and channels state-related resources to private firms. Such flows are recorded differently from conventional FDI statistics. Brazys and Jung (2024) rely on geo-referenced aid and FDI data and find that local aid boosts local FDI. Their results also show that Chinese FDI responds to World Bank aid, which complicates attribution to any single source (Brazys & Jung, 2024). Mohamued et al. (2024) use 14 years of data from 42 African countries, while Yuan and Ji (2025) cover 2003 to 2022 with OLS, PPML, and GMM methods. Luo and Chen (2024) match many databases to capture executive experience and firm characteristics. The need for such database matching shows that no single register is complete. Oya and Schaefer (2023) make a related point for wage evidence. They argue that many claims about Chinese firms rest on unconvincing evidence and identify problems with the existing literature. The same caution applies to investment volume claims. Therefore, the following proposition has been developed:

P2 (measurement): *Estimates of Chinese investment diverge by more than an order of magnitude depending on definition and source, so that policy claims about investment volume are not reliable without reconciliation.*

Local capacity-building appears to work differently in agriculture and mining. Lin and Cui (2024) treat the Chinese Agriculture Technology Demonstration Center as a quasi-natural experiment. Using country-by-crop panel data from 2000 to 2018 and a triple difference-in-differences design, they find increased crop production and improved trade dependence. The effects are stronger for free-standing technical support and for centres operated by state-owned enterprises. They conclude that the centres have implications for local agriculture and rural development (Lin & Cui, 2024). This is direct evidence of a documented, locally linked mechanism. The mining evidence is weaker on local linkages. Muhirwa et al. (2023) find that offers to communities from large extractive industries remain low and some are declining as technology advances. Government plans for local value development around mining sites have been ignored or excluded for many years. Sändig et al. (2024) show that Chinese mining companies concede mainly under recurrent disruptive action, state or NGO pressure, and reputational concern. Responsiveness is conditional rather than routine. Conteh and Conteh (2026) likewise report weak local linkages and thin technology transfer alongside substantial Chinese investment in minerals. Oya and Schaefer (2023) reinforce the point that sector specificities shape outcomes in Chinese firms. Agriculture therefore shows a clearer capacity-building pathway than mining. Diffusion in agriculture nonetheless remains small relative to the national sector. The demonstration-centre model reaches limited numbers of farmers and crops. Therefore, the following proposition has been developed:

P3 (sector asymmetry): *Local capacity-building mechanisms are better documented, and more directly linked to local enterprises, in agriculture than in mining, but diffusion in agriculture remains small relative to the national sector.*

4. Methodology

The study uses a quantitative secondary-data design with embedded case analysis. It draws on official statistics, international databases, published research, and policy documents rather than primary fieldwork. This enables systematic analysis of trade and investment trends, permits cross-source triangulation, and builds cumulatively on existing findings. It also fits the cost and time limits of the project. Conteh and Conteh (2026) use a similar logic, combining documentary analysis with secondary statistics because no single source captures Chinese activity in full. Because the available series are short and irregularly spaced, the analysis is descriptive and comparative rather than inferential. No regression or significance testing is attempted. The findings are framed as patterns and magnitudes, not causal estimates.

The theoretical perspectives are operationalised through measurable indicators (Table 1). Institutional strength is proxied by fiscal capture and local-employment shares. Technology

transfer is proxied by yield gains, training volumes, and diffusion area. Structural dependence is proxied by export concentration. A fourth construct, measurement reliability, captures the gap between competing investment estimates and mirror-trade gaps.

Table 1. Operationalisation of theoretical constructs

Construct	Quantitative indicator	Data source
Structural dependence	Share of leading product in exports to China; China's share of total exports	UN Comtrade / OEC; Ministry of Mines
Institutional mediation	Government receipts as % of mineral export value; local share of sector employment	Ministry of Mines and Mineral Resources (2025)
Technology transfer	Yield multiple vs. baseline and national average; diffusion area as % of national rice land	FAO, AidData, project reports, national statistics
Measurement reliability	Ratio of highest to lowest estimate of Chinese FDI; mirror-trade gaps	MOFCOM, AEI, UNCTAD, Comtrade

Table 2 lists the data sources. Each is graded for reliability: **A** for official statistical agencies and international statistical databases; **B** for ministry statements, international-organisation project records, and tracker datasets; **C** for press reports, aggregators, and single-source claims. Grade C items are used only to illustrate and are not the basis for any headline conclusion.

Table 2. Data sources, coverage, and reliability grade

Source	Variables used	Coverage	Grade
UN Comtrade (via OEC, Trading Economics)	Bilateral merchandise trade; product composition	2018–2024	A
Chinese Ministry of Commerce / customs; Chinese Embassy	Bilateral totals; 2025 trade in yuan and US$	2024–2025	A/B
MOFCOM and National Bureau of Statistics (via Statista)	Chinese outward FDI stock in Sierra Leone	2022–2023	A
UNCTAD World Investment Report	FDI inflows; total FDI stock	2021–2024	A
American Enterprise Institute tracker (via Reuters)	Chinese investment and construction since 2010	2010–2023	B
Ministry of Mines and Mineral Resources	Mineral exports, fiscal receipts, employment, production	2020–2024	B
FAO / UN South-South Galaxy; AidData	Project yield outcomes	2008–2017	B
National and local press; project reports	Yield plots, rice area and output, 2025 mineral exports	2010–2026	C

Note: *Chinese Ministry of Commerce trade records report values in US$ hundred-millions.*

Five quantitative techniques are applied. (1) Growth and balance analysis uses the compound annual growth rate,

$$\mathrm{CAGR} = \left(\frac{V_{\mathrm{end}}}{V_{\mathrm{start}}}\right)^{\frac{1}{n}} - 1$$

, and the bilateral balance as China's imports minus exports. (2) Concentration analysis uses the share of the leading product in exports and its contribution to growth, computed as the change in that product's value divided by the change in total exports. (3) Mirror and reconciliation analysis uses the ratio of partner-reported to reporter-reported values for the same flow, and the ratio of the highest to the lowest estimate of Chinese FDI. (4) Fiscal and local-content ratios are government receipts divided by export value, and Sierra Leonean employees divided by total employees. (5) Case analysis covers two cases, selected because they are the best documented and sit at opposite poles of the sectoral spectrum. One is capital-intensive extraction and the other is knowledge-intensive agriculture. Both are analysed with the same indicator set and compared in a scorecard. Qualitative thematic analysis of policy documents supports interpretation, and triangulation compares official statistics against independent estimates. Two data-handling conventions apply. Figures for 2025 are estimates derived from the reported total (US$2.28 billion), the reported growth in Sierra Leonean exports (above 40 percent), and the reported balance, and are marked “2025e”. Where sources conflict, both values are shown and the discrepancy is itself treated as a finding.

5. Results and Discussion

Merchandise trade between China and Sierra Leone roughly quadrupled between 2018 and 2025 (Table 3, Figure 1). Total trade rose from US$505 million in 2018 to about US$2.28 billion in 2025, a CAGR of 24.0 percent. The growth was asymmetric. China's imports from Sierra Leone grew at 30.6 percent a year over 2018–2025 (37.8 percent over 2018–2023), against 17.8 percent for China's exports to Sierra Leone. As a result the bilateral balance reversed. China ran a surplus of US$91 million in 2018 and a deficit that reached about US$419 million in 2023 and an estimated US$400 million in 2025.

Table 3. China–Sierra Leone merchandise trade, selected years (US$ million)

Year	China exports to SL	China imports from SL	Total trade	Balance (China imports – exports)
2018	298	207	505	−91
2022	573	622	1,195	+49
2023	611	1,030	1,641	+419
2024	811	960	1,771	+149
2025e	≈940	≈1,340	≈2,280	≈+400
CAGR 2018–25e	**17.8%**	**30.6%**	**24.0%**	**n/a**

Sources: *2018, 2022, 2023: OEC (UN Comtrade-based, China-reported); 2024 Chinese exports: UN Comtrade via Trading Economics; 2024 imports and 2025 totals: Chinese Ministry of Commerce records (converted from US$ hundred-millions), Xinhua (2026) and Embassy of the People's Republic of China in Sierra Leone (2026); 2025 split derived. Years 2019–2021 are not reported in the sources consulted. Positive balance = deficit for China.*

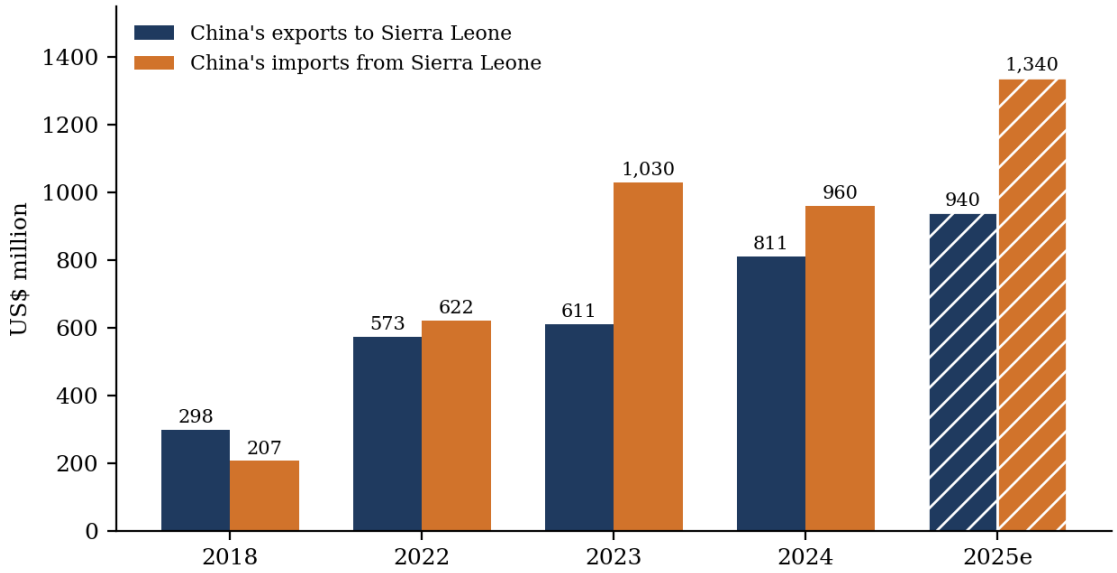


Figure 1. China–Sierra Leone merchandise trade, selected years (US$ million). Hatched bars are 2025 estimates.

The 2024–2025 acceleration, about 29 percent in total (the 29.3 percent in source records reflects unrounded values), follows only 7.9 percent growth from 2023 to 2024, and came on the back of rising iron-ore shipments. The reported 38 percent rise in the first half of 2026 suggests that the zero-tariff measures effective from May 2026 had not yet produced the main effect. The 2026 data should therefore be treated as a continuation of the extractive-led trend until composition data show otherwise. This fits the view that trade growth in mineral-rich economies tends to follow extraction (Yu & Wang, 2023). Sierra Leonean exports to China are highly concentrated (Table 4, Figure 2). Iron ore accounted for 76.7 percent of recorded exports to China in 2022 and 87.1 percent in 2023. Between 2022 and 2023 exports to China rose by US$408 million, of which iron ore alone contributed US$420 million. Non-iron-ore exports therefore fell slightly, and iron ore explains about 103 percent of the increase. China absorbed 54 percent of Sierra Leone's recorded goods exports in 2022 and about 68 percent in 2023. Proposition P1 is supported. The

trade surge is a one-commodity phenomenon, and diversification into palm oil, coffee, cocoa and fishing remains a prospect and is not yet a measured outcome. This result matches Conteh and Conteh (2026), who describe narrow export flows dominated by minerals and fisheries. It also supports Fambo and Ge (2025), since the diversification channel through which Chinese OFDI could support growth is not yet visible in Sierra Leone's export data.

Table 4. Composition of Sierra Leonean exports to China (US$ million)

Product	2022	2023	Change
Iron ore	477.0	897.0	+420.0
Rough wood	74.2	n.l.	—
Titanium ore	n.l.	64.3	—
Niobium, tantalum, vanadium, zirconium ore	30.1	45.1	+15.0
All other	40.7	23.6	−17.1
Total	**622**	**1,030**	**+408**
Iron ore share of total	76.7%	87.1%	+10.4 pts

Source: *OEC (2024, 2025), China-reported bilateral data. n.l. = not among the three leading products listed for that year. "All other" is the residual.*

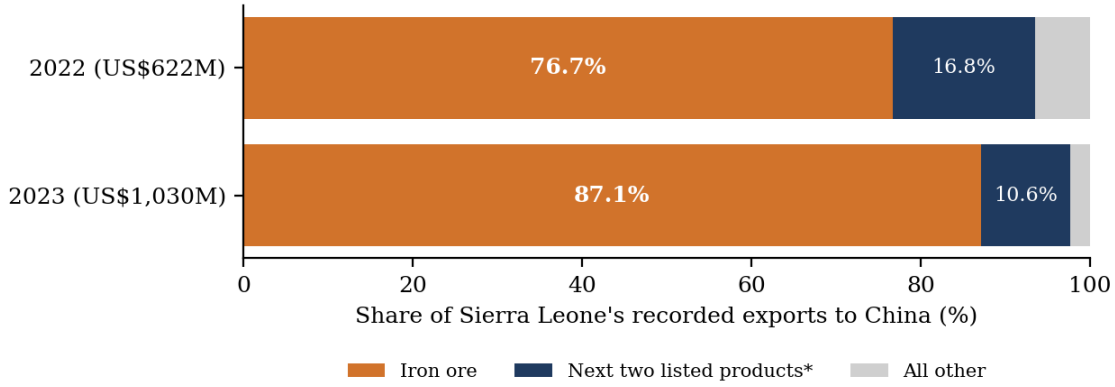


Figure 2. Export concentration: Sierra Leone to China (share of recorded exports, %). *Next two listed products: rough wood and niobium group ores (2022); titanium ore and niobium group ores (2023).

Chinese exports to Sierra Leone are more diversified but dominated by capital and intermediate goods (Table 5, Figure 3).

Table 5. Leading Chinese exports to Sierra Leone, 2024

Product group (HS chapter)	US$ million	Share of total (%)
Electrical and electronic equipment	145.7	18.0
Machinery, nuclear reactors, boilers	138.5	17.1
Articles of iron or steel	72.4	8.9
Vehicles other than railway	48.1	5.9
Plastics	39.4	4.9
Railway and tramway equipment	27.8	3.4
Iron and steel	27.7	3.4
Footwear	25.7	3.2
All other	285.7	35.2
Total	**810.9**	**100.0**

Source: UN Comtrade via Trading Economics (2025). Shares computed from the source values.

In 2024 electrical equipment (18.0 percent) and machinery (17.1 percent) together made up 35 percent of the US$811 million total. Iron and steel products, vehicles, railway equipment and plastics added a further 25.6 percent. This is relevant to technology transfer, because machinery and equipment imports are a principal channel for embodied technology. Yet the same goods compete with, and can substitute for, local fabrication and assembly. Rice is a notable consumer-

goods exception. China supplied US$60.1 million of Sierra Leone's US$161 million rice imports in 2022, 37 percent of the total. China is therefore simultaneously a technical partner in domestic rice production and a major supplier of imported rice.

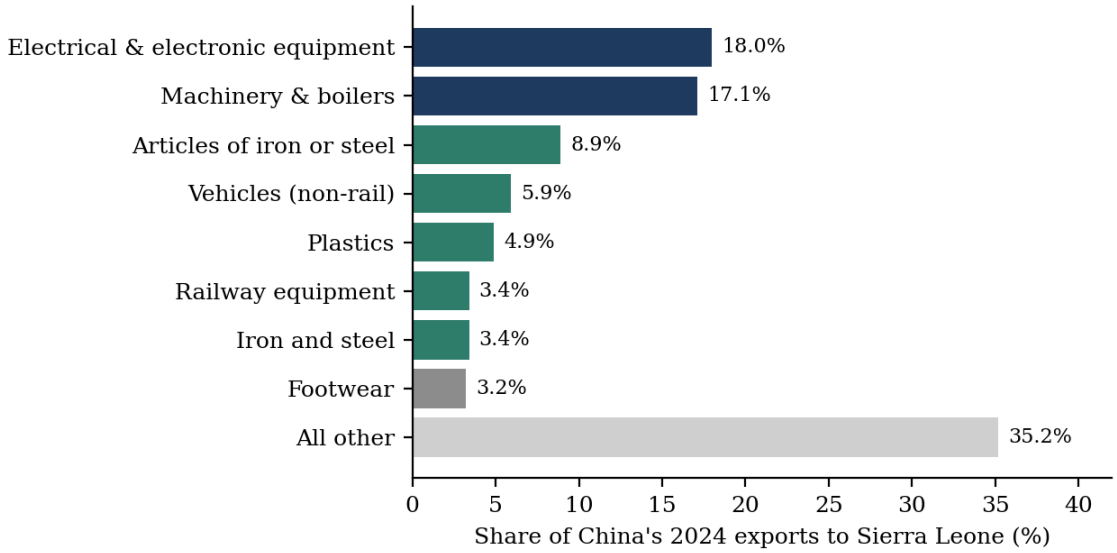


Figure 3. Composition of Chinese exports to Sierra Leone, 2024 (% of US$811 million)

The size of Chinese investment in Sierra Leone depends almost entirely on the data source (Table 6, Figure 4).

Table 6. Alternative measurements of Chinese investment and total FDI in Sierra Leone

Measure	Value (US$)	Ratio to MOFCOM stock	Basis
MOFCOM/NBS recorded FDI stock, end-2022	87.5 million	—	Stock, recorded
MOFCOM/NBS recorded FDI stock, end-2023	89.7 million	1.0×	Stock, recorded
Official reporting: cumulative Chinese investment	> 2.0 billion	≈22×	Cumulative, reported
AEI tracker: investment and construction since 2010	6.4 billion	≈71×	Cumulative, transactions
UNCTAD total FDI stock, 2023 (all investors)	≈3.0 billion	≈33×	Stock, all sources
UNCTAD total FDI inflows 2022 / 2023 / 2024	145 / 241 / 274 million	—	Flow, all sources

Sources: MOFCOM and National Bureau of Statistics via Statista (2024); Reuters (2024) citing AEI; Germany Trade & Invest (2025); UNCTAD fact sheets and WIR (latest vintage; earlier vintages reported 2022 inflows at US$250 million and 2023 at US$263 million, an illustration of statistical revision).

Chinese Ministry of Commerce and National Bureau of Statistics data record an outward FDI stock in Sierra Leone of only US$87.5 million in 2022 and US$89.7 million in 2023. This equals about 3 percent of Sierra Leone's total FDI stock of roughly US$2.7–3.0 billion. Official reporting puts cumulative Chinese investment above US$2 billion, and the American Enterprise Institute tracker records US$6.4 billion since 2010, mainly in metals (Reuters, 2024). The highest estimate is therefore about 71 times the lowest, and the official claim is 22 times the recorded stock. This supports Proposition P2. Three explanations are plausible and are not mutually exclusive. The tracker covers investment and construction transactions, which are not equivalent to FDI as defined in balance-of-payments statistics. Chinese capital is often routed through intermediary jurisdictions, so that recorded country-level FDI understates operational presence, a pattern termed “phantom FDI” in Rhodium Group (2025). Finally, large mining operations may be financed through debt, offtake agreements, or local reinvestment rather than equity. Xia and Chen (2023) show that state-linked equity support is recorded differently from conventional FDI,

which points the same way. Coface (2026) nonetheless identifies China as the largest provider of FDI in Sierra Leone, mainly in mining. This confirms that the official stock figure understates China's role. Against total inflows of US$145 million (2022), US$241 million (2023) and US$274 million (2024) reported by UNCTAD, the recorded change in Chinese stock between 2022 and 2023 (US$2.2 million) is under 1 percent of one year's inflows. This shows how little of the observable investment is attributed to Chinese sources in official series. Brazys and Jung (2024) add that Chinese FDI follows aid from several donors, so attribution to a single source is hard even with detailed geo-referenced data.

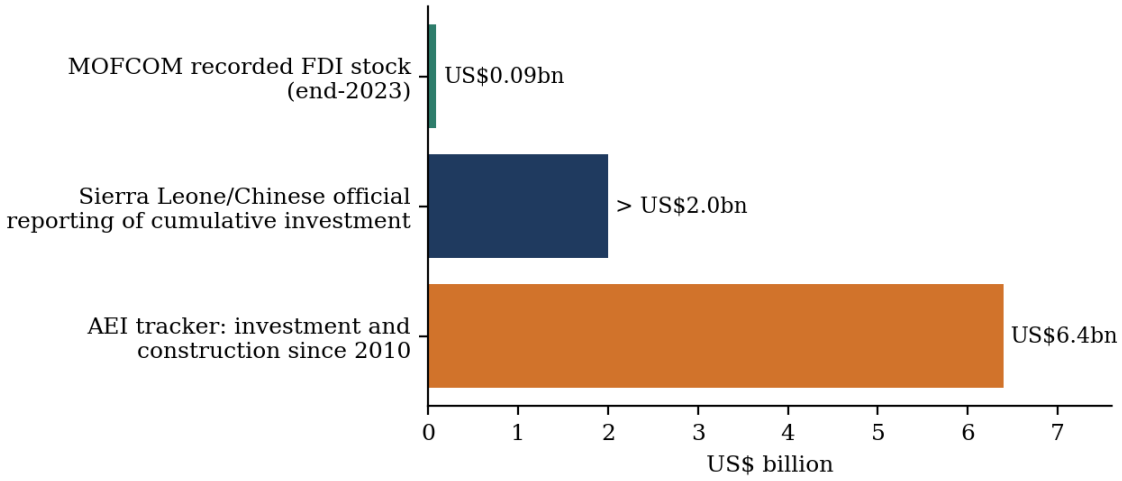


Figure 4. Three measurements of Chinese investment in Sierra Leone (US$ billion)

The investment reconciliation has a direct methodological implication. A seventy-fold spread between the lowest and highest estimates means that statements about the "scale of Chinese investment" are definitional claims. Any assessment of developmental returns per dollar invested is unreliable until the sources are reconciled. The discrepancy is itself relevant to institutional analysis. A host government that cannot observe the size or ownership of investment is poorly placed to enforce local content and fiscal obligations. This extends Yuan and Ji's (2025) finding on institutional quality by showing that statistical capacity is part of institutional quality. Mohamued et al. (2024) also stress institutional characteristics in explaining the efficiency of Chinese investment in Africa, and the present evidence adds a data dimension to that argument.
Iron ore is the largest trade link and the main destination of Chinese capital. Chinese-owned Kingho Mining operates the Tonkolili mine, and Marampa Mines, a Gerald Group operation, exports mainly to China. Sector data from the Ministry of Mines and Mineral Resources (2025) allow quantification of scale, fiscal capture, local employment, and downstream processing. Mineral exports rose from US$310 million in 2020 to US$1.16 billion in 2023, eased to US$1.12 billion in 2024, and reached about US$1.3 billion in 2025, up 16 percent (Figure 5). Iron ore was US$784.5 million in 2024, 70.3 percent of the total, based on 10.98 million dry metric tonnes at an average US$74 per tonne. The sector is price-exposed. Each US$10 per tonne change in the iron-ore price shifts export value by about US$110 million and royalty receipts at the 3.5 percent rate by about US$3.8 million.

Direct government receipts from the mining sector were about US$59 million in 2024, comprising US$27.9 million in royalties, US$21.4 million in licence fees, and US$8–9 million in tax payments. This equals 5.3 percent of mineral export value, with royalties alone at 2.5 percent. For iron ore the statutory royalty is 3.5 percent, and applying it to 2024 iron-ore exports gives US$27.5 million. That is almost the entire reported royalty receipt, which indicates that other minerals contribute little by comparison. Community Development Fund payments were US$1.66 million plus NLe 56.2 million, of which Kingho contributed NLe 53 million. The sector employed 15,929 people in 2024, of whom 14,807 (93.0 percent) were Sierra Leonean and 1,122 (7.0 percent)

expatriates. The headline local share is high but conceals the skill distribution. Of 14,167 company positions, 435 (3.1 percent) were senior management and 1,265 (8.9 percent) supervisory, while 88.0 percent were below supervisory level. Nationality is not reported by occupational level in the source, so whether local workers hold the upper positions cannot be determined. This is the single most important missing indicator for local-content assessment. Supplier-level data, such as the value of procurement from Sierra Leonean firms, are not reported at all. The gap is consistent with Conteh and Conteh (2026), who report weak local linkages in mineral investment, and with Muhirwa et al. (2023), who find that the offer of extractive industries to communities remains low. Kingho is preparing a 12-million-tonne processing plant and a 30-million-tonne magnetite plant (30–40 percent complete), and has commissioned a 49 MW thermal plant. Marampa raised capacity to 3.75 million tonnes a year and added a 22 MW power plant. If completed, these investments would shift exports from raw or concentrate to processed forms. Until commissioned, however, iron ore is shipped unprocessed or as concentrate and local value added remains low (bne IntelliNews, 2025). Table 7 summarises the mining indicators.

Table 7. Mining case indicators, 2024 unless stated

Indicator	Value	Derived measure
Total mineral exports	US$1,120 million	2023: US$1,160 million; 2025: ≈US$1,300 million
Iron-ore exports	US$784.5 million	70.3% of mineral exports
Iron-ore volume and price	10.98 m DMT at US$74/DMT	±US$10/DMT ≈ ±US$110 million
Direct government receipts	≈US$59 million	5.3% of mineral export value
Royalties	US$27.9 million	2.5% of export value; statutory iron-ore rate 3.5%
Sector employment	15,929	92.96% Sierra Leonean; 7.04% expatriate
Company positions by level	435 / 1,265 / 12,467	3.1% / 8.9% / 88.0%
Local procurement and supplier share	Not reported	Data gap

Sources: Ministry of Mines and Mineral Resources (2025); 2025 exports from Africa Intelligence/Rio Times (2026); derived measures calculated from the source values.

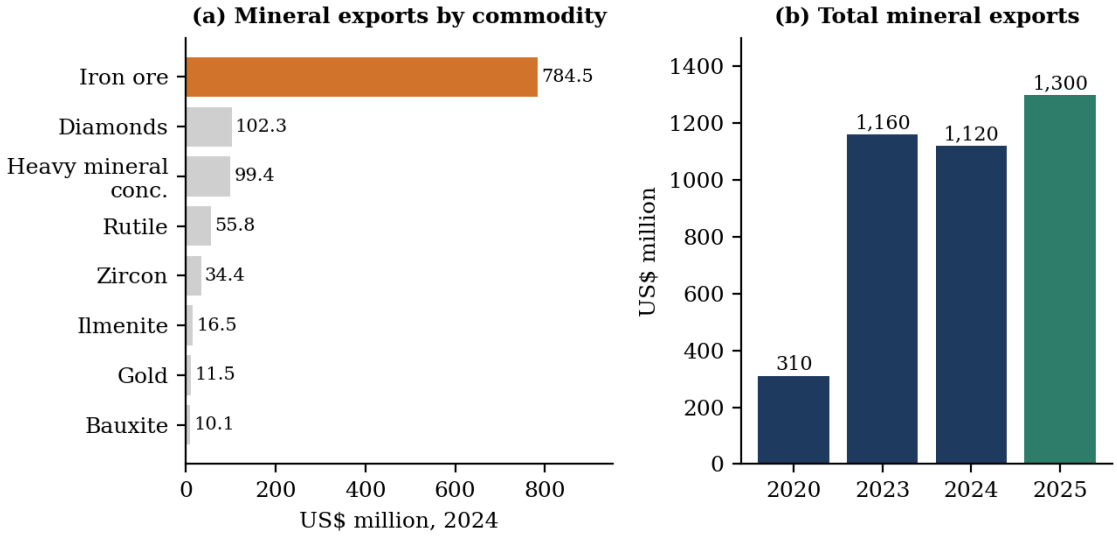


Figure 5. Mining case: (a) mineral exports by commodity, 2024; (b) total mineral exports (US$ million)

Rice is Sierra Leone's staple, its leading import (US$161 million in 2022), and the focus of long-running Chinese technical cooperation. This runs from the demonstration projects of the 2000s to the fourteenth expert group, which has established six demonstration bases (Science and Technology Daily, 2026). Project records provide yield observations, and national statistics provide a benchmark. Reported yields in Chinese-supported projects range from 2.1 to 9.0 tonnes per hectare (Table 8, Figure 6), with a median of 4.5 and a mean of 4.9 across the five Sierra

Leonean observations. Against baselines of 0.9 tonnes per hectare, FAO-documented projects report gains of 2.3 times (to 2.1) and, in the Phase II demonstration as summarised by AidData, 4.6 times (to 4.1). The recent Njala Farm plot reports 9 tonnes per hectare against 1–3 for local varieties, a 3- to 9-fold gain, and the same source reports that six demonstration bases have been established. Relative to the 2023 national average of 2.1 tonnes per hectare, the demonstration yields are 1.0 to 4.3 times higher, with the median plot at 2.1 times. The Côte d'Ivoire comparator (2.75 times, with post-harvest losses falling from 25 to 10 percent) falls within the same range.

Table 8. Reported rice yields in Chinese-supported projects (tonnes per hectare)

Observation	Baseline	Reported yield	Multiple of baseline	Multiple of national avg (2.1)	Source / grade
FAO–China South-South food project	0.9	2.1	2.3×	1.0×	UN South-South Galaxy (B)
Rice Growing Demonstration, Phase II	0.9	4.1	4.6×	2.0×	FAO via AidData (B)
Ogoo Farm demonstration plot, 2010	n.r. ("2–3× typical")	4.5	2–3×	2.1×	IPS (C)
Bo district promoted varieties, 2017	n.r.	4.6	—	2.2×	Awoko (C)
Njala Farm, 14th expert group, 2024–25	1–3	9.0	3–9×	4.3×	Science and Technology Daily (C)
Côte d'Ivoire WARVC (comparator)	0.8	2.2	2.75×	n/a	Project reports (B)
Median, Sierra Leone observations		**4.5**		**2.1×**	

Notes: *n.r. = not reported. National average yield 2.1 t/ha in 2023 (Awoko, 2024); the 2024 national composite reported by CARD is 2.19. Multiples computed from the source values.*

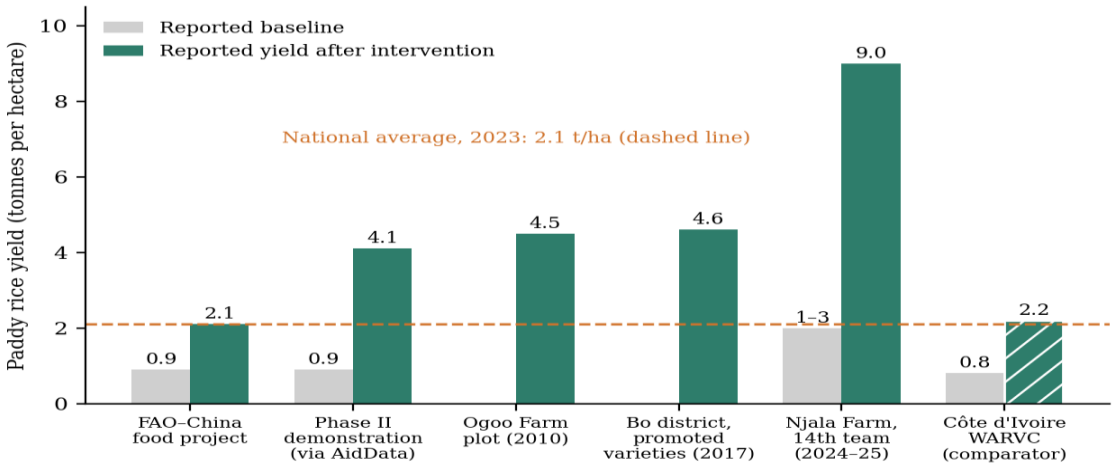


Figure 6. Reported rice yields in Chinese-supported projects against the 2023 national average (tonnes per hectare). The Njala Farm baseline is the mid-point of the 1–3 range

The documented diffusion area is very small. In the 2017 promotion, 13 tonnes of seed of two varieties could cover about 570 hectares, which is about 0.09 percent of the 607,207 hectares planted to rice in 2023. The Njala plot is 5 hectares. The Chinese government also supplied 120 tonnes of compound fertiliser and 50 tonnes of urea. Since 2005 at least 30 farmers and Ministry of Agriculture officials each year have been sent to China for training (Inter Press Service, 2010). This is a transfer of skills to institutions as well as farmers. An illustrative scenario shows the stakes. If 1 percent of national rice area (about 6,070 hectares) moved from 2.1 to 4.0 tonnes per hectare, output would rise by roughly 11,500 tonnes of paddy, about 0.9 percent of 2023 output of 1.28 million tonnes. The gain is real but modest, because impact is limited by diffusion, not by agronomy. Lin and Cui (2024) reach a more positive continental result, with higher crop

production and better trade dependence. They also show that free-standing technical support and state-owned operators matter. The Sierra Leone evidence is consistent with this direction but is far smaller in scale. Several caveats apply. Demonstration plots receive managed inputs and expert supervision and are not representative of farm-level yields. The two FAO-based figures for the same baseline (2.1 and 4.1) differ and cannot be reconciled from the sources consulted. The 9-tonne figure is a single plot reported in the press (grade C). No study in the sources consulted follows adopters over time. The yield multiples should therefore be read as evidence of technical potential, not of realised farm-level impact. Table 9 places the two cases side by side on the same indicators. Mining delivers scale (US$785 million of exports), measurable fiscal capture (5.3 percent of export value), and high headline local employment. Local procurement, technology transfer, and downstream processing are undocumented or still prospective. Agriculture has the opposite profile. It has strong technical evidence, institutional training links, and direct farmer contact. Yet its diffusion footprint is about 0.1 percent of rice land, and its fiscal or export footprint is negligible. Proposition P3 is therefore supported in its first half, since capacity-building is better documented in agriculture. It is qualified in its second half, since agricultural diffusion remains small. The constraint in agriculture is scale, and the constraint in mining is local linkage. This matches the view of Oya and Schaefer (2023) that sector specificities shape outcomes in Chinese firms.

Table 9. Comparative scorecard of the two cases

Dimension	Mining (iron ore)	Agriculture (rice cooperation)
Scale	US$784.5 million exports; 70% of mineral exports	Demonstration plots; ≈570 ha promotion area (0.09% of rice land)
Fiscal or public return	≈US$59 million, 5.3% of export value	Grant-funded; inputs worth tonnes of fertiliser and urea
Local employment	93% Sierra Leonean (15,929 jobs); occupational split unknown	30+ officials and farmers trained in China each year since 2005
Technology-transfer evidence	Plants under construction; no transfer metrics	Yield multiples 2.1–4.3× national average (plot level)
Local supplier linkage	Not reported	Seed, inputs and mills supplied; farmer sales to government documented
Main constraint	Linkage and processing	Diffusion scale and post-harvest losses
Evidence grade	B	B/C

Source: *synthesis of Tables 7 and 8.*

On institutional mediation, the available indicators suggest that Sierra Leone's formal framework is already capturing part of the mining rent. Royalties reconcile closely with the statutory iron-ore rate, and licence fees doubled in 2024. Enforcement of the Mines and Minerals Act also appears active. The Ministry granted 20 new industrial licences in 2024 and reported that 75 percent of industrial licences were active. Government statements at the Chinese Chamber of Commerce inauguration explicitly linked continued investment promotion to compliance with local content policy, labour law, and the Finance Act. This indicates an evolving bargaining process. Sändig et al. (2024) show that Chinese mining companies respond to sustained pressure from state actors, NGOs, and communities, so such public statements may matter. Birhanu et al. (2016) warn that weak governance, such as bribery, can undermine fixed investment. Transparent enforcement therefore protects the investment climate as well as public revenue. The evidence for local enterprises specifically remains qualitative. Eleveld and Pennink (2021) provide the perception evidence, and no secondary dataset reports firm-level supplier integration or entrepreneur outcomes. The results for the three propositions can now be stated together. P1 (concentration) is supported. Iron ore supplied 87.1 percent of exports to China in 2023 and explains about 103 percent of the rise in exports between 2022 and 2023 (Table 4, Figure 2). P2 (measurement) is supported. Estimates of Chinese investment range from US$87.5 million to US$6.4 billion, so the highest is about 71 times the lowest (Table 6, Figure 4). P3 (sector asymmetry) is partly supported. Capacity-building is better documented in agriculture, with yields of 2.1 to 4.3 times the national average at plot level (Table 8, Table 9). Diffusion, however, covers only about 0.09 percent of rice land, so the second half of the proposition is confirmed as

a limit on impact and not as a failure of the mechanism. Together, these results show that concentration, weak measurement, and limited diffusion are the three conditions that shape local enterprise outcomes in Sierra Leone.

The quantitative evidence supports the institutional and agency–structure framing. Chinese trade is large and growing, yet its expansion is dominated by one commodity. Sierra Leone's exposure to Chinese demand and to the iron-ore price has deepened rather than diversified. A 68 percent share of goods exports going to one partner, 87 percent of which is one product, implies that bilateral trade outcomes are largely determined by a single price and a handful of mines. This is consistent with the resource-oriented pattern described in the literature and with Calabrese's (2023) finding that benefits from Chinese engagement depend on the capacity of domestic institutions to capture and redistribute them. It also fits Yuan and Ji (2025), whose results show that good institutional quality in the host country facilitates FDI expansion. The case comparison indicates that sector-specific design matters. In mining, the revenue instruments work, but the knowledge and supplier channels are undocumented, so policy should focus on measuring and contracting for local linkage. In agriculture, the knowledge channel is documented but small, so policy should focus on diffusion, input supply, processing and post-harvest loss. These findings extend Eleveld and Pennink's (2021) micro-level account by locating entrepreneur perceptions within a macro and sectoral quantitative context, as they themselves recommend. The analysis has clear limits. Series are short and irregular, the 2025 split is derived, and mirror and source discrepancies cannot be resolved from public data. Even so, the main patterns are consistent across independent sources, such as the Comtrade iron-ore figures and the Ministry's production and price data. This strengthens confidence in the direction and rough magnitude of the findings, if not in their precision.

6. Practical Applications

The findings give managers, investors, and policy officers a short list of indicators to track. For Chinese mining firms, the data show that fiscal payments are measurable and that local employment is high at 93 percent (Table 7). The weak points are skills and supply. Only 3.1 percent of company positions are senior management, and no procurement data exist (Table 7). Firms that publish employment by nationality and grade, and local procurement values, would answer the main open question directly. Sändig et al. (2024) show that Chinese mining companies respond to reputational concern and to pressure from state actors and NGOs. Voluntary disclosure would therefore protect their social licence at low cost. Muhirwa et al. (2023) add that collaboration and diversification of rural economic sources help link extractive industries to community development. Kingho's Community Development Fund payments are a starting point for such work. For local enterprises, the agricultural case offers the clearest entry route. Training, seed, inputs, and mills are already supplied through the technical cooperation (Table 9). Local firms can position themselves as seed multipliers, input dealers, and processors. This would help to widen diffusion, which is the binding constraint in rice (Table 8, Figure 6). In mining, the large capital programmes at Tonkolili and Marampa create demand for local contractors in services, power, and logistics. Chinese exports of machinery and electrical equipment (Table 5) also create room for local repair, assembly, and distribution businesses. Fambo and Ge (2025) suggest that partnerships between African enterprises and Chinese counterparts can open routes to innovation and technology transfer. Joint ventures and supplier agreements are the practical form of such partnerships. Local firms should also read trade data with care. Because iron ore supplies 87 percent of exports to China (Table 4, Figure 2), small exporters of palm oil, coffee, and cocoa should expect gains from zero-tariff access only if supply-side support follows. Business associations can help. They can engage the Chinese Chamber of Commerce, share information on supplier standards, and press for enforcement of local content rules. Oya and Schaefer (2023) show that firm attributes and sector specificities explain outcomes better than national origin. Local enterprises should therefore judge each partner by its actual practice, not by general claims about Chinese firms. Price risk also matters in practice. Each US$10 per tonne move in iron ore

shifts export value by about US$110 million (Table 7), so contractors that depend on mining demand should plan for volatile orders.

7. Theoretical Applications

The study contributes to institutional theory in three ways. First, it shows with quantified indicators how fiscal instruments, statistical capacity, and enforcement jointly condition the outcomes of foreign investment in a small, resource-dependent economy. Royalties that reconcile with the statutory rate (Table 7) show a working fiscal institution. The seventy-fold range in investment estimates (Table 6, Figure 4) shows a weak statistical institution. Statistical capacity is therefore part of institutional quality. This extends Yuan and Ji (2025) and Mohamued et al. (2024), who treat institutional quality and institutional distance as drivers of Chinese investment. It also fits North (1990), since the formal rules matter only when they can be observed and enforced. Second, the study contributes to the technology-transfer literature. It documents yield gains, training volumes, and diffusion scale in agriculture (Table 8, Table 9). It also shows that diffusion scale, not technical efficacy, is the binding constraint. Lin and Cui (2024) show that demonstration centres raise crop production across Africa. Our evidence adds a country-level lesson. A mechanism can work and still reach very few farmers. Technology transfer should therefore be assessed on both depth and reach. The mining case adds a second lesson. Embodied technology arrives through plants and equipment, but knowledge transfer to local firms is not documented (Table 7, Table 9). This supports the view in Conteh and Conteh (2026) that conversion from enclave investment to linkage-rich investment depends on absorptive capacity and governance. Third, the findings support an agency–structure reading. Structure is visible in the concentration of exports and in the price exposure of the mining sector (Table 4, Table 7). Agency is visible in royalty collection, licence enforcement, and the conditions attached to investment promotion. Xia and Chen (2023) show that state involvement in Chinese finance has both strengths and costs, which fits this mixed picture. Brazys and Jung (2024) show that Chinese FDI is not exceptional among donors, so Sierra Leonean institutions face a familiar bargaining problem rather than a unique one. Finally, the study offers a methodological contribution. Grading sources, reconciling competing estimates, decomposing growth by product, and pairing aggregates with indicator-matched cases form a replicable template for secondary-data analysis of a bilateral economic relationship.

8. Policy Applications

The findings point to measurable priorities. The first concerns mining licences. The Government of Sierra Leone should require disaggregated reporting of employment by nationality and occupational level, and of procurement from Sierra Leonean suppliers. Table 7 shows that these are the two missing indicators in an otherwise well-documented sector. Muhirwa et al. (2023) argue that policy coherence and collaboration are needed so that government plans for local value around mining sites are no longer ignored. Local content monitoring should be extended from agriculture to mining and infrastructure, with company-level reporting on training expenditure as well. Technology-transfer requirements should be written into mining and infrastructure agreements, modelled on the demonstration-farm and training-centre approach, and tied to measurable milestones. Downstream processing commitments, such as the magnetite plant, should carry dated milestones, because until they are commissioned local value added remains low. The second priority is data. An inter-ministerial data unit, drawing on the Ministries of Finance, Trade, Mines and Agriculture, should reconcile Chinese and Sierra Leonean bilateral and investment statistics. It should publish a single reference series with definition-specific figures, so that the seventy-fold range in estimates narrows (Table 6). Oya and Schaefer (2023) show how unconvincing evidence can sustain strong claims about Chinese firms, and Luo and Chen (2024) show that complete pictures need matched databases. A reference series would let negotiators and regulators work from shared facts. The unit should also track mirror-trade gaps and flag revisions, since UNCTAD inflow figures were revised between vintages (Table 6).

The third priority is diversification. Iron ore supplies 87 percent of recorded exports to China (Table 4), and China's zero-tariff access from May 2026 creates an opening for palm oil, coffee,

cocoa, and fisheries. Fambo and Ge (2025) show that export diversification is the channel through which Chinese OFDI can support growth. Zero-tariff access should therefore be linked to export-diversification support for smallholders and small enterprises, covering seed, inputs, processing, standards, and post-harvest handling. In agriculture, the demonstration model should be scaled into a multi-year diffusion programme with adoption tracking, because the documented promotion area covers only about 0.1 percent of rice land (Table 8, Table 9). Finally, mineral price exposure argues for fiscal buffers. Receipts of about US$59 million depend on a single price (Table 7), and Yu and Wang (2023) note that trade uncertainty poses challenges for mineral exporters. Chinese investors, for their part, should expand joint ventures and local-supplier arrangements and publish local employment and procurement figures. Greater transparency on investment volumes would narrow the reconciliation gaps identified here.

9. Conclusion

This paper has examined Chinese investment and local enterprise development in Sierra Leone through quantitative secondary-data analysis and two sectoral cases. Trade has grown about fourfold since 2018 and now stands near US$2.3 billion. The growth is dominated by iron ore, which explains more than all of the 2022–2023 increase in exports to China. Chinese investment is measured so inconsistently, with a seventy-fold range, that its scale is a matter of definition. In mining, fiscal receipts and local employment shares are measurable and respectable, but local procurement and technology transfer are not documented. In agriculture, transfer is well evidenced at plot level, but diffusion is about 0.1 percent of national rice land. All three propositions find support, with the third qualified by the small scale of diffusion. Institutional enforcement capacity, including the capacity to measure and reconcile data, is therefore the main factor mediating whether Chinese capital inflow translates into sustainable local enterprise development. The timing is opportune given the fifth Chinese Chamber of Commerce, the zero-tariff measures effective May 2026, and continuing agricultural cooperation.

10. Limitations and Future Research Directions

As a secondary-data study, this paper cannot capture firm-level perceptions or behaviour that are not already documented. The evidence on local enterprises is therefore qualitative, and the agricultural evidence rests on project records and not on measured firm outcomes. Future research should prioritise firm-level surveys of technology absorption among Sierra Leonean enterprises in Chinese-linked value chains, in mining and infrastructure as well as agriculture. The study also relies on the accuracy and comparability of official statistics, and mirror and source discrepancies cannot be resolved from public data. The study cannot say which investment estimate is closest to the truth. Future work should combine customs microdata, company filings, and ministry records to build a reconciled investment series. The series are short and irregular, since 2019–2021 are missing and the 2025 splits are derived from reported totals. Two years of composition data cannot show whether export concentration is persistent. A natural quantitative extension, once longer annual series are assembled, is a panel analysis of trade and investment composition against institutional-quality indicators. The mining indicators are sector-wide and not specific to Chinese-owned firms, and local supplier data are not reported. This limits what can be said about local linkage in mining. Longitudinal tracking of local supplier integration around Chinese-owned mines would close this gap. Finally, the agriculture case includes grade C evidence and plot-level yields that are not representative of farm-level outcomes. The small diffusion footprint of about 0.1 percent of rice land is also based on a single promotion. Adoption studies of hybrid rice beyond demonstration plots, and comparative cases across other West African hosts, would show whether the diffusion constraint found here is general.

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