

Two Markets, Two Resources: **Documenting China's Engagement in Africa**

HORIZON ADVISORY

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Executive Summary

Total trade between China and the nations of the African continent totaled \$8 billion in 2000. In 2019, that figure topped \$200 billion. China's annual foreign direct investment in Africa stood at \$75 million in 2003. By 2018, that figure had swelled to over \$5 billion. State-owned China Nonferrous Metal Mining made the first known Chinese investment in an African mine in 1998. Today, Chinese companies own or invest in at least 77 mines on the African continent. Chinese companies have invested in, backed, and built road, rail, port, and air infrastructure; dozens of industrial parks and agriculture technology development areas; and, increasingly, foundations for emerging technological systems including telecommunications, surveillance, and financial technology across the African continent.

This engagement with countries in African is propelled by the Chinese government. Much is undertaken by State-owned enterprises (SOEs). The engagement has evolved from resource acquisition to resource control, horizontal and vertical industrial integration, influence over Africa's industrial development, and even the use of localized positions in African markets to access global export opportunities, including in the EU and Western hemisphere.

This report seeks to document the nature of Beijing's engagement in Africa. The analysis reviews Chinese strategic discourse and investments, as well as Sino-African interactions across economic, commercial, and military spheres. This report argues that Beijing prioritizes Africa for its mineral and energy resource wealth. Beijing also values the African continent as a testbed for industrial policy, technology, and military development.

The ultimate purpose of this report is to provide U.S. decision-makers with robust empirics and a replicable framework with which to monitor and respond to the CCP's global economic and security campaign.

Key Findings

The CCP engages in Africa according to the logic and mechanisms of the "Go Out" program and the strategic theory of "Two Markets, Two Resources" (两个市场,两种资源). Two Markets, Two Resources distinguishes domestic resources and markets from foreign ones. The global market is to be penetrated while the Chinese one is, relatively, insulated. Foreign resources are to be siphoned while domestic ones are, relatively, defended. According to the Two Markets, Two Resources logic, the Chinese Communist Party (CCP) prioritizes four key areas in Africa:

- Energy and mineral resources,
- Markets for goods and services,
- Industrial and security infrastructure, and
- Standards for foundational systems, especially of commerce, infrastructure, and industry.

In these areas, Beijing pursues not just access but also control. Chinese SOEs and State-backed firms invest in the resources of countries on the African continent and build corresponding, integrated industry chains. These industry chains are increasingly connected to information

technology (IT) systems that may allow Chinese integration and control to extend beyond the African continent. IT systems may also – through China’s military-civil fusion program – be integrated with and propel Beijing’s security apparatus.

Beijing operationalizes its engagement with Africa through a “State-led, Enterprise-driven” approach. This approach leverages CCP backing, direction, and incentive-shaping policies to guide commercial activity according to a set, economically- and strategically-motivated vision of Africa’s value to Beijing. The State-led, Enterprise-driven approach does not directly determine all individual projects or investments in Africa. It does shape channels and incentives for them. In areas that the Chinese government prioritizes, this approach can foster duplication, inefficiencies, and what appears to be patchwork activity.

China’s activity in Africa bears security and economic implications for the United States.

- China’s investment in resources whose known reserves are clustered on the African continent may permit Beijing outsize influence over international supply. The risks are particularly severe for critical, supply-limited inputs for advanced and emerging industrial applications (e.g., inputs like the cobalt and lithium required for electric vehicle batteries).
- Beijing may use integrated industrial chains in Africa to retain dominance in low-cost global manufacturing even as costs in China rise. In exporting Chinese technical standards, Beijing may be able to cement influence over these industrial chains.
- Proliferation of China’s technical standards in Africa may also help propel the CCP’s efforts to set global standards, especially in emerging systems (e.g., financial technology). As many African countries rapidly transform into consumer societies, this will create lock-in to Chinese technologies and guarantee Chinese firms a dominant market position.
- Chinese information networks across Africa, built in large part by military-civil fusion (MCF) actors, could, in the long term, foster information asymmetry and challenge the ability of the U.S. military to project power in the region.

In many cases, Chinese investments in Africa are indirect or obfuscated – or exist within integrated industrial, supply, and investment chains. This can challenge attempts to assess China’s position, corresponding risks, and vulnerabilities. Similarly, Beijing’s military-civil fusion model, and information sharing within it, might obscure the development of security-relevant positioning despite what remains a limited, conventional Chinese military presence on the African continent.

Introduction: The African Continent in China's Two Markets, Two Resources

Total trade between China¹ and the nations of the African continent totaled \$10.5 billion in 2000.² In 2019, that figure topped \$200 billion.³ China's annual foreign direct investment in Africa stood at \$75 million in 2003. By 2018, that figure had swelled to over \$5 billion.⁴ Chinese companies have invested in, backed, and built road, rail, port, and air infrastructure; dozens of industrial parks and agriculture technology development areas; mines and mineral processing facilities; and, increasingly, foundations for emerging technological systems including telecommunications, surveillance, and financial technology across the African continent.

This report analyzes primary source Chinese strategic discourse about and resource allocations in Africa. The report argues that Beijing prioritizes the continent's mineral and energy resource wealth. Beijing also values the African continent as a testbed for industrial policy, technology, and military development. "It is no mere rhetoric that China needs Africa," wrote Zhang Hongming, Deputy Director of the Chinese Academy of Social Sciences' African Studies Institute, in 2017. "Africa has political, economic, and even strategic resources that China uses in order more effectively to expand its interests – thus turning operations in Africa into a strategic outer line for China's geopolitical strategy of great power relations."⁵

According to Zhang, the CCP prioritizes four key areas in Africa:⁶

- Energy and mineral resources,
- Markets for goods and services,
- Industrial and security infrastructure, and
- Standards for foundational systems, especially of commerce, infrastructure, and industry.⁷

¹ The authors would like to thank Zachary Shevin for his invaluable research assistance.

² Kingsley Ighobor, "China in the Heart of Africa," *UN Africa Renewal*, January 2013.

³ People's Republic of China Ministry of Commerce, "Statistics on China-Africa Trade in 2018,"

⁴ China-Africa Research Initiative, "Chinese Investment in Africa," Johns Hopkins School of Advanced International Studies.

⁵ Zhang Hongming, "China's Strategic Operations Research on Africa" (中国对非洲战略运筹研究), *West Asia and Africa*, 2017. Translation. Zhang frames these priorities in terms of China's larger strategic ambitions: "China's interests in Africa are not solitary, but exist as part of China's national interests as a whole." Writing in 2017, he also paints a longitudinal picture: "Compared to the past, a prominent change in China's demand for Africa is that it increasingly values Africa's economic value, especially resources and markets, and incorporates the continent in to the mid- and long-term planning of national development strategies...From a trend perspective, China will further expand the field of radiation of its African interests in the next five to ten years." (Ibid.)

⁶ Those are the "priorities" in what Zhang describes as normal situations. Under "abnormal situations," when China faces emergent threats or opportunities, the CCP uses Africa to strengthen its international image and multilateral standing. Zhang cites attacks on China's human rights abuses in the last decade of the 20th century: "At that time, China made the most of its diplomatic resources in Africa, obtaining international support from African countries." More recently, he notes, "African countries have expressed their approval for and support of China's position in the South China Sea issue." (Zhang Hongming, "An Analysis of China's Interest Level in Africa" (中国在非洲利益层次分析), *West Asia and Africa*, 2016. Translation.)

⁷ Zhang Hongming, "An Analysis of China's Interest Level in Africa" (中国在非洲利益层次分析), *West Asia and Africa*, 2016. Translation.

In these areas, Beijing's engagement pursues not just access but also integrated control. Beijing secures mining rights in African countries and develops them with Chinese companies and management. Beijing's State-owned and private⁸ enterprises also build their own factories and facilities in Africa to process the continent's resources, benefiting from low production costs. Investments in infrastructure allow Chinese actors to transport, or influence the transportation of, goods and resources being produced in Africa. In many cases, infrastructure invested in by Chinese government and commercial players is built on Chinese standards, which can make it dependent on China's expertise and industrial chains.⁹ Together, these threads amount to vertically integrated operations in Africa. The relevant operations are largely economic, but they provide the foundations for influence in security and information as well as commercial domains.

The CCP's industrial positioning in Africa reflects the long-standing Go Out program. Go Out defines Beijing's web of industrial plans, including the Strategic Emerging Industry Initiative and Made in China 2025. The Belt and Road Initiative, and Beijing's larger apparatus of government-directed investment and industrial integration, operationalize these plans globally. China's military-civil fusion (军民融合)¹⁰ program connects industrial efforts to the security domain. China's standards strategy¹¹ outlines an emerging goal: To claim a global rule-setting role.

This ecosystem of plans, strategies, and mechanisms is defined by a calculus about globalization and its opportunities codified in the CCP's ambitious "Two Markets, Two Resources" (两个市场, 两种资源)¹² strategic theory. First appearing in Chinese policy documents in the early 1980s, Two Markets, Two Resources distinguishes domestic resources and markets from foreign ones.¹³ The global market is to be penetrated while the Chinese one is, relatively, insulated. Foreign resources are to be siphoned while domestic ones are, relatively, defended. Two Markets, Two Resources should not be understood as a bid for decoupling or absolute self-sufficiency. The theory does not reject globalization. Instead, it takes advantage of globalization, leveraging asymmetric domestic protection and control against the more open global environment to foster one-sided dependence.¹⁴

⁸ This report uses the term "private sector" or "private" to describe China-domiciled firms that are not directly State-owned by a central CCP authority or equivalent provincial or municipal arm of the Chinese state. The use of the "private" designation should not be conflated with the common conceptions in the United States of distinctions between non-governmental and governmental sectors. The "private" China-domiciled actors discussed in this report maintain a variety of direct connections to the Chinese government, including in the form of State backing and oversight. For example, "private" Chinese firms often receive significant subsidies from the State and incorporate Chinese Communist Party committees into their internal operation and decision-making structures. These reflect the "State-led, Enterprise driven" model cited in this report.

⁹ Mohammed Yusuf, "Cost of China-built Railway Haunts Kenya," *Voice of America*, February 26, 2020.

¹⁰ Emily de La Bruyère and Nathan Picarsic, "Beijing's Innovation Strategy: Threat-Informed Acquisition for an Era of Great Power Competition," Naval Postgraduate School Acquisition Research Symposium, May 2020.

¹¹ Emily de La Bruyère and Nathan Picarsic, *China Standards 2035: Beijing's Platform Geopolitics and Standardization Work in 2020*, Horizon Advisory; Arjun Kharpal, "Power is 'Up for Grabs': Behind China's Plan to Shape Next Generation Tech," *CNBC*, April 26, 2020.

¹² This phrasing is not set in stone. Other, seemingly interchangeable, permutations include "两种资源,两个市场," "两种资源, 两个市场," and "两个市场,两种资源."

¹³ China National Conditions Research Center, "Two Kinds of Resources and Markets: Research on Constructing China's Resource Security System" (两种资源 两个市场: 构建中国资源安全保障体系研究), 2001. Translation.

¹⁴ As the China National Conditions Research Center, jointly operated by the Academy of Sciences and Tsinghua University, explained in 2001 research on Two Markets, Two Resources: "The dependence relationship between our country and the world's resource market is gradually improving." (China National Conditions Research Center, "Two

For Two Markets, Two Resources to work, Beijing must establish leverage over consolidated sources of critical global resource supply. Then it must establish dominance over critical nodes in existing supply and industrial chains. The value of those positions compounds if they can be translated into influence over global standards and networks of exchange. Networks and standards constitute rules and architectures for global markets and resources. Rulemaking confers advantages in commerce and in information access. For example, if a country's enterprises set the standards for railway gauges at border crossings, their wheel assemblies are likely to enjoy higher demand. Overseeing rulemaking at the World Trade Organization provides access to information about dispute resolutions and an ability to affect corresponding norms.

In a concrete example of Two Markets, Two Resources, Chinese sources outline an international competition for mineral resources in which China must protect its own supplies while investing in foreign ones to create what Yao Guimei of the Chinese Academy of Social Sciences calls a "global mineral resources supply guarantee system."¹⁵ A 2015 article by researchers at the Chinese Academy of Sciences and Chinese Academy of Geological Sciences explains that China must defend its domestic resources through export restrictions and production limits while acquiring and investing in overseas mineral reserves to "shape global resources."¹⁶

Beijing sees African countries as a cost-efficient frontline for Go Out and the Two Markets, Two Resources calculus behind it. The continent's rich natural resource endowment offers footholds into global supply. In many African countries, low cost of labor creates a favorable environment in which to develop consolidated industrial chains on top of that resource endowment. Africa's growing, developing markets provide testbeds for emerging networks and standards.¹⁷

Beijing's positioning in Africa responds to the continent's need for economic engagement. However, Beijing often responds to that need in a fashion that fosters systemic reliance. As China trades with, invests in, lends to, and provides industrial support to African markets – and offers security and humanitarian assistance – targeted African states come to rely on Beijing. This report's case studies on Angola and Kenya, for example, outline dependencies on China stemming from Chinese dominance over the countries' oil exports and infrastructure, respectively. Dependence paves the way for the Chinese government and commercial actors to influence resources, industrial chains, and standards. China is the top export market for 13 African countries. It is the top import partner of 27 (Figure 1). That status can create reliance on China, as the source of a significant proportion of economic activity.

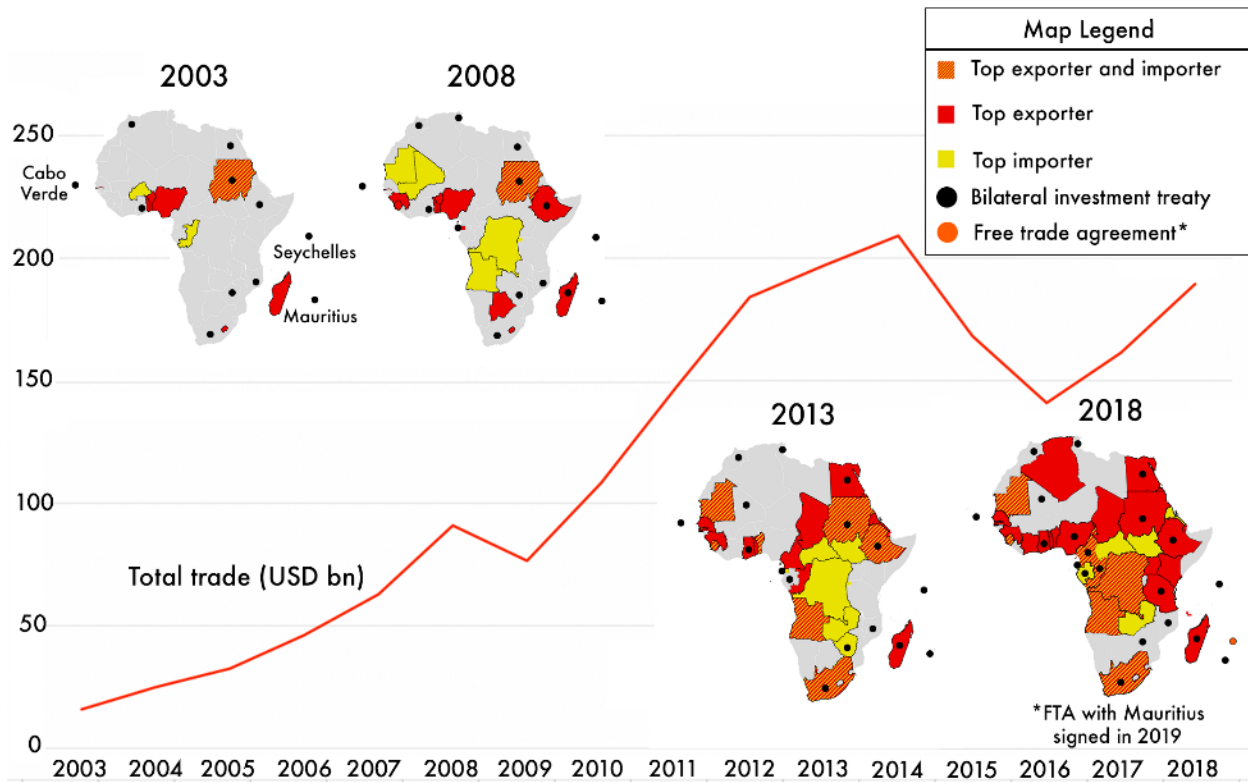
Kinds of Resources and Markets: Research on Constructing China's Resource Security System" (两种资源 两个市场: 构建中国资源安全保障体系研究), 2001. Translation)

¹⁵ Yao Guimei, "Strategic Consideration on Exploitation and Utilization of African Mineral Resources" (关于开发利用非洲矿产资源的战略思考), *West Asia and Africa*, 2003. Translation.

¹⁶ Yu Wenji et al., "New Global Patterns and New Chinese Resource Strategies" (世界新格局与中国新矿产资源战略观), *Resource Science*, 2015. Translation.

¹⁷ "Most African countries," explains Zhang Hongming, "are in the initial stage of industrialization, with abundant natural and human resources, coupled with unresolved industrial and market demand. Huge development space creates huge opportunities." (Zhang Hongming, "An Analysis of China's Interest Level in Africa" (中国在非洲利益层次分析), *West Asia and Africa*, 2016. Translation.)

Figure 1: China's Trade with Africa: China as Top Export & Import Partner, 2003-2018¹⁸



This report aims to assess the Chinese government's approach to Africa and the implications for U.S. economic and national security interests. The sections of this report that follow address the tools with which China engages in Africa, China's interests in African mineral and agriculture sectors, and industrial and security cooperation, respectively. A series of narrative case studies covering Angola, South Africa, Kenya, and Liberia are incorporated to provide detail on Beijing's engagement with individual African states.

A Note on Methodology

This report draws on China's resource allocations and strategic writings to assess China's positioning, preferences, constraints, and strategic intent in Africa over time.¹⁹ The report pairs that analysis with narrative exposition and case studies to convey fact-based background; identify strategic patterns suggestive of objectives, preferences, and constraints in policy making and action; and assess trends and their implications.

For the purposes of this report, Africa refers to the geographic contours of the African continent spanning North Africa, East Africa, West Africa, and Sub-Saharan and South Africa. The scope applied in this analysis also includes island nations that are commonly associated with the African

¹⁸ "UN Comtrade: International Trade Statistics Database." United Nations; "China FTA Network." Chinese Ministry of Foreign Affairs; "Investment Policy Hub." United Nations Conference on Trade and Development (UNCTAD).

¹⁹ Several series of graphics beyond those referenced in the text of this report can be found in the Appendix.

continent.²⁰ Egypt stands out as one nation that is considered within the scope of this analysis though it does not fall within the area of responsibility of the U.S. military's Africa Command (USAFRICOM).

Reference Figure: Countries of Africa



At various points, the report refers to the collective African continent. The report also cites Chinese discussions that refer to Africa in its entirety. Several key findings and recommendations have general applications and utility across the continent. However, the analysis does not assume that the continent is a monolith. Nor does it assume monolithic behaviors or attitudes vis-à-vis China. The advanced analysis seeks to reflect the nuance intrinsic in China's engagement at the national and local levels on the African continent.²¹

The credibility, authoritativeness, and relevance of individual primary sources cited in this report are vetted based on individual, institutional, and publisher affiliations within the Chinese system. A broad array of materials is included. These range from official Chinese government policies and proclamations to industry and professional commentaries to peer-reviewed academic studies. Where possible, reference to secondary materials focuses on those that are based in or commenting

²⁰ The entire set of countries included in the definition applied is: Algeria; Angola; Benin; Botswana; Burkina Faso; Burundi; Cabo Verde; Cameroon; Central African Republic; Chad; Comoros; Congo, Democratic Republic of the; Congo, Republic of the; Cote d'Ivoire; Djibouti; Egypt; Equatorial Guinea; Eritrea; Eswatini (formerly Swaziland); Ethiopia; Gabon; Gambia; Ghana; Guinea; Guinea-Bissau; Kenya; Lesotho; Liberia; Libya; Madagascar; Malawi; Mali; Mauritania; Mauritius; Morocco; Mozambique; Namibia; Niger; Nigeria; Rwanda; Sao Tome and Principe; Senegal; Seychelles; Sierra Leone; Somalia; South Africa; South Sudan; Sudan; Tanzania; Togo; Tunisia; Uganda; Zambia; Zimbabwe.

²¹ As with the entirety of the report, errors and omissions in this regard are the fault of the authors.

on primary source inputs. Additional secondary sources include media and industry commentaries that draw on relevant resource allocation data and discourse.

Strategic discourse is tested against resource allocations. Data sources referenced as evidence or indication of resource allocations include China-based statistical services; data collections housed by multilateral fora, like the UN; data collections from commercial research services; and original analysis aggregating data points across Chinese primary source and secondary source press coverage. Such independent analyses include aggregation of data on Chinese industrial zones and agricultural development zones from government and investment websites. They also include comprehensive collection of press releases from major Chinese investment vehicles and SOEs in Africa. Where possible, these sources have been aggregated and validated externally. Additional emphasis has been placed on accumulating time series data to permit longitudinal insight and identification of anomalies in statistical reporting.

This analysis is limited in its scope and objectives, as well as its data. The analysis focuses on assessing Beijing's perspectives, strategic intentions, and resource allocations. The same level of scrutiny and inspection has not been applied to the official discourse of African nations. The analysis is largely focused on China's investments in commercial domains. China also engages with Africa across diplomatic and informational spheres not covered in as much depth in this report. And while the analysis is thorough in its sourcing, many of Beijing's relationships and engagements in Africa exist in opaque, fragmented, or evolving fields for which limited primary source data exists. No fieldwork was conducted. The case studies are limited in number and in depth.

Background: Two Markets, Two Resources

The strategic concept labeled Two Markets, Two Resources is generally credited to Hu Yaobang, Chairman and General Secretary of the CCP from 1981 until 1987.²² The phrase “Two Markets, Two Resources,” first appears in the 1981 proceedings from the Fourth Session of the Fifth National People’s Congress (NPC):

We have to use two kinds of resources – first, domestic resources and second, international resources – develop two markets – first, domestic markets and second, international markets – and learn two skills – first, the ability to manage the domestic economy and second, the ability to manage international trade.²³

In pursuit of those objectives, the NPC called for increasing exports, including of electromechanical and metal processing products; introducing advanced technology and imported equipment from foreign countries where those could not be manufactured domestically;²⁴ and leveraging foreign funds to develop resources that China lacked. As NPC proceedings put it, those measures, would “not only hinder [China’s] own shortcomings but also enhance [China’s] self-reliance.”²⁵

When Jiang Zemin began formulating the “Go Out” program a decade later, he did so with Two Markets, Two Resources as a core intellectual underpinning. Shen Chuanliang of the CCP’s Central Party School writes:

At the end of 1993, the Third Plenary Session of the 14th Central Committee of the CCP specified the ‘Exploiting International Markets’ and ‘Utilizing Foreign Resources’ that had been defined by the 14th National Congress of the Communist Party [held in October 1992]... This can be regarded as a preliminary ‘Go Out’ strategy.²⁶

In a 2002 speech on the urgency of implementing Go Out, then-President Jiang Zemin declared that “the implementation of the ‘Go Out’ strategy is a major measure to push the opening up to a new stage, an inevitable choice for better use of domestic and foreign markets and resources.”²⁷

²² “Big Events in China in 1982” (1982 年中国大事记), *China News*, December 5, 2008. Translation.

²³ National People’s Congress, “Resolutions of the Fourth Session of the Fifth National People’s Congress on the Report on ‘Current Economic Situation and Guidelines for Future Economic Construction’” (第五届全国人民代表大会第四次会议关于“当前的经济形势和今后经济建设的方针”报告的决议), December 13, 1981. Translation.

²⁴ But only as individual, rather than complete, sets of equipment, and where import was paired with absorption.

²⁵ National People’s Congress, “Resolutions of the Fourth Session of the Fifth National People’s Congress on the Report on ‘Current Economic Situation and Guidelines for Future Economic Construction’” (第五届全国人民代表大会第四次会议关于“当前的经济形势和今后经济建设的方针”报告的决议), December 13, 1981. Translation; National People’s Congress, “Government Work Report at the Fourth Session of the Fifth National People’s Congress,” (1981 年 11 月 30 日和 12 月 1 日在第五届全国人民代表大会第四次会议上的政府工作报告), November 30 and December 1, 1981. Translation.

²⁶ Shen Chuanliang, “Historical Evolution of China’s Opening Strategy” (中国对外开放战略的历史演), *Journal of Liaoning Normal University*, 2014. Translation.

²⁷ Shen Chuanliang, “Historical Evolution of China’s Opening Strategy” (中国对外开放战略的历史演), *Journal of Liaoning Normal University*, 2014. Translation.

Two Markets, Two Resources continues to frame the CCP's industrial, economic, and strategic planning. The theory is cited as an orienting logic in 2011 guidance on the Strategic Emerging Industries Initiative,²⁸ the State Council's Made in China 2025 plan issued in 2015,²⁹ and the 13th Five Year Plan issued the same year,³⁰ as well as prominent military texts, including the *Science of Military Strategy* published by the Academy of Military Sciences.³¹ In a 2011 article, Ni Hongxing of the Ministry of Agriculture applies Two Markets, Two Resources to agriculture. He writes that “the key to maintaining the security of China's agricultural industry is to strengthen the overall planning for the use of Two Markets, Two Resources for agriculture:”

Supply of major agricultural products, especially food, cannot depend on imports...The use of foreign markets and foreign resources cannot affect the development of Chinese agriculture.... China's agricultural product trade policy cannot rest on short-term comparative advantages and benefits, but rather on the necessary level of self-sufficiency to maintain China's influence over pricing in international agricultural products.³²

In other words, Ni is arguing that Beijing cannot rely on market forces to govern the global allotment of agricultural products and China's share thereof. Ni cites foreign monopolies over grain production, as well as foreign capital and exports, as factors that “undermined China's control over and pricing power in the soybean industry.”³³

The CCP's Two Markets, Two Resources approach hinges on scale and centralization. Beijing's centralization makes it more able to insulate its systems (e.g., information networks, supply chains) than most global players. Beijing can also better influence the incentives of its private and commercial actors, encouraging them to respond to national objectives rather than direct profit or market pressures. Beijing describes this approach as “State-led, enterprise-driven.”³⁴

²⁸ State Council, Guiding Opinions on Promoting the International Development of Strategic Emerging Industries (关于促进战略性新兴产业国际化发展的指导意见), October 25, 2011. Translation.

²⁹ State Council of the People's Republic of China, Made in China 2025 (国务院关于印发《中国制造 2025》的通知), May 8, 2015. Translation.

³⁰ Jiangxi Provincial People's Government, “Proposal of the Central Committee of the Communist Party of China on Formulating the 13th Five-Year Plan for National Economic and Social Development” (中共中央关于制定国民经济和社会发展第十三个五年规划的建议), November 23, 2015. Translation.

³¹ “Make full use of the two international and domestic markets and two resources, realize the circulation of factors, industrial docking, and complementary advantages on a global scale.” Shou Xiaosong, ed., *Science of Military Strategy* (战略学), Military Science Press, 2013. Translation.

³² Ni Hongxing, “Integrate Two Markets and Two Resource to Ensure the Safety of the Agricultural Industry” (统筹两个市场两种资源 确保农业产业安全), *China Rural Economy*, May 30, 2011. Translation.

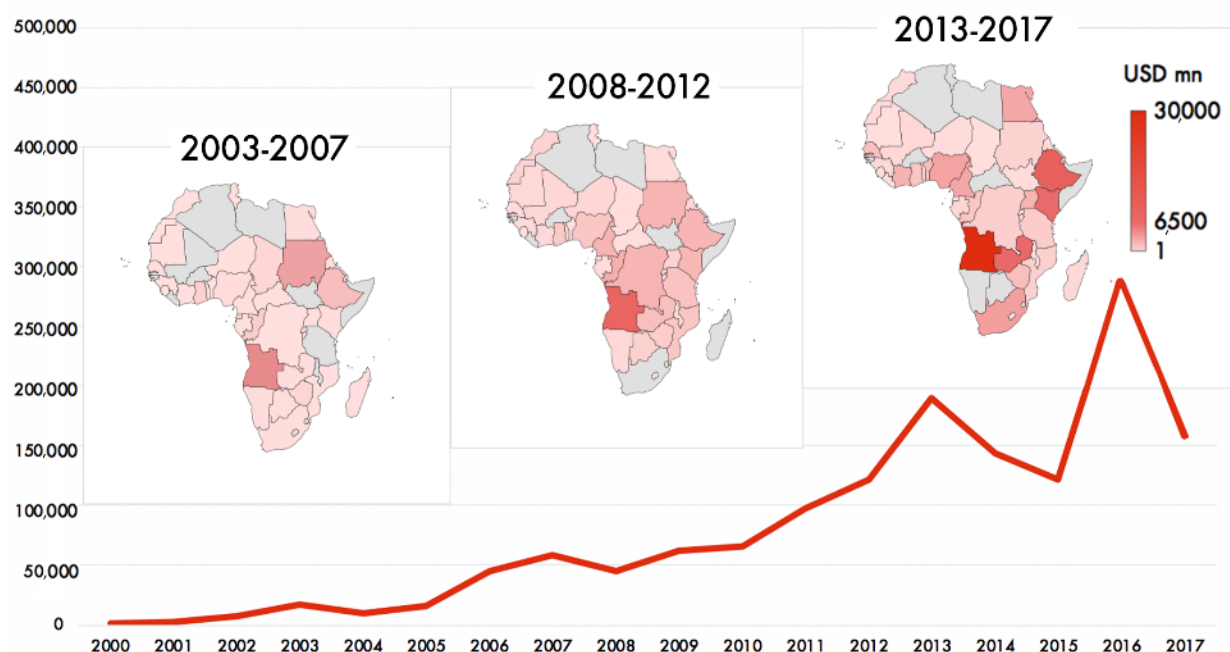
³³ Ni Hongxing, “Integrate Two Markets and Two Resource to Ensure the Safety of the Agricultural Industry” (统筹两个市场两种资源 确保农业产业安全), *China Rural Economy*, May 30, 2011. Translation.

³⁴ Gu Dawei, “China-Africa Three Networks, One Standardization and Production Capacity Cooperation Help Africa's Industrialization Process,” (中非“三网一化”与产能合作助力非洲工业化进程) *China Investment*, 2016. Translation.

Tools and Mechanisms

According to the “State-led, Enterprise-driven” logic, Beijing engages in Africa through central and local SOEs supplemented, increasingly, by private companies.³⁵ All benefit from a range of government support mechanisms designed both to encourage and to shape investment in Africa. These mechanisms include funding and policy incentives. Government support mechanisms also serve as coordinating forces, organizing, for example, alliances and supply chain partnerships among Chinese companies. Sections that follow in this chapter summarize some of the primary tools – including policy banks and investment vehicles – and mechanisms (e.g., subsidies, preferential loans) through which Beijing encourages engagement in Africa. Aggregate trends in China’s lending to African countries are reflected in Figure 2 and Appendix B.1.

Figure 2: China’s Loans to Africa, 2003-2017 (USD million)³⁶



China’s Export-Import Bank (EXIM Bank), which underwrites China’s foreign preferential loans,³⁷ set up an office in South Africa in 1999. It is also a shareholder of the African EXIM Bank.³⁸ In 2017, *Xinhua News* identified 39 “major Sino-African cooperation projects.” Of those,

³⁵ Wu Fang, “Eight Actions Promote High-Quality Development of China-Africa Infrastructure Cooperation” (八大行动促进中非基础设施合作高质量发展), *International Engineering and Labor*, 2019. Translation.

³⁶ Deborah Brautigam et al., “Chinese Loans to Africa Database,” China Africa Research Initiative, Johns Hopkins University School of Advanced International Studies. Published March 2020. Maps include loans with specified countries but do not include loans to “regions.” From 2003-2007, there were \$92mn in regional loans. From 2008-2012, there were \$228mn, and from 2013-2017 there were \$2,960mn (Ibid)

³⁷ The term “preferential loans” as used in this report refers to loans with more favorable terms than the market standard.

³⁸ Zhang Chunyu and Tang Jun, “New Progress in China-Africa Financial Cooperation” (中非金融合作新进展), *East Asia Aspect*, 2014. Translation.

24 were backed by the China EXIM Bank.³⁹ An example of the Chinese government’s priority lending areas, and preferential loan standards, for overseas projects is reflected in Figure 3.

China’s EXIM Bank’s activities in Africa focus on infrastructure construction. As of July 2019, China EXIM Bank’s financing had covered 46 countries in Africa, with a cumulative contract value exceeding \$88 billion (600 billion RMB).⁴⁰ Examples range from Nigeria’s Coastal Railway, a \$12 billion project undertaken in 2014, to loan-for-minerals deals in the Democratic Republic of the Congo (DRC).⁴¹ Four of the eight projects signed by the China EXIM Bank in the first quarter of 2020 were in Africa: Oil area roads in Uganda, a photovoltaic power plant in Lesotho, the modernization of Madagascar’s communication network, and information and communication modernization in the DRC.⁴²

At the 2015 Forum on China-Africa Cooperation (FOCAC), Xi Jinping announced the establishment of the China-Africa Industrial Capacity Cooperation Fund (CAFIC), a development investment fund with an initial capital of \$10 billion, backed by foreign exchange reserves and China EXIM Bank.⁴³ As of October 2018, CAFIC had invested in 12 projects in Africa with a total value of \$1.4 billion.⁴⁴

Figure 3: Project Standards for Discounted Loans⁴⁵

Project name	Minimum contract amount (USD)	Minimum loan amount (RMB)
Foreign contracted engineering contract	5 million	3 million
Overseas investment and forestry, fish and mining cooperation projects	1 million	3 million
Overseas Development Center Chinese investment and agricultural cooperation	500,000	1.5 million

The China Development Bank (CDB) complements China EXIM’s footprint, providing medium and long-term development credit. CDB has cooperative relationships with a host of African policy banks and governments, including the African Development Bank, Africa EXIM Bank, West

³⁹ “Export-Import Bank: Focus on China-Africa Development and Help China-Africa Cooperation” (进出口银行：聚焦中非发展 助力中非合作), *Rural Financial Times*, August 31, 2018. Translation.

⁴⁰ “Export-Import Bank Africa Has Covered 46 Countries” (进出口银行非洲业务已覆盖 46 个国家), *Xinhua News*, July 9, 2019. Translation.

⁴¹ In 2007, the China EXIM Bank loaned the DRC \$9 billion – later reduced to 7 billion – to improve its mining infrastructure. In exchange, the DRC National Copper Company promised 10.6 million tons of copper, 425,000 tons of cobalt, and 625,000 tons of other mineral deposits. (China EXIM Bank)

⁴² “Six Major Projects of the Export-Import Bank’s Overseas Loans in the First Quarter” (进出口银行一季度海外贷款的 6 大项目 非洲为主), *Sohu News*, April 15, 2020. Translation.

⁴³ “China-Africa Industrial Capacity Cooperation Fund,” China EXIM Bank, eximbank.gov.cn.

⁴⁴ “China-Africa Is a Win-Win: Official,” *China Daily*, October 9, 2018.

⁴⁵ Xu Lingbo and Yu Haonan, “The Experience and Challenges of Chinese Enterprises’ Investment in African Industrial Park: Taking Ethiopian Oriental Industrial Park as an Example” (我国企业对非洲产业园投资的经验与挑战：以埃塞俄比亚东方工业园为例), *Business Modernization*, 2019. Translation.

African Development Bank, South African Development Bank, and East African Development Bank.⁴⁶

The China Africa Development Fund (CAD Fund): The CDB established the CAD Fund in 2007.⁴⁷ Fully funded by the CDB and approved by the State Council, the CAD Fund supports Chinese companies investing in Africa. It currently has a scale of over \$10 billion and has invested over \$4.8 billion in more than 90 projects in 36 African countries.⁴⁸ The CAD Fund's focus areas are: mining and oil and gas (e.g., chromium, iron, copper, cobalt, gold, platinum);⁴⁹ electricity (e.g., thermal, hydro, wind, solar power; grid construction and acquisition); building materials (e.g., cement, glass, ceramics); machinery manufacturing (e.g., agricultural and construction machinery, automobiles, home appliances); industrial parks; infrastructure, transportation, and telecommunications; large-scale agriculture; banking, and tourism.⁵⁰ Trends in China's direct investment into Africa are reflected in Figure 4.

The CAD fund invests in and with Chinese companies to propel engagement in Africa.⁵¹ For example, the CAD Fund holds a 45 percent stake in Chery Overseas Industrial Investment, a joint venture launched by China's Chery Automobile in 2011 to establish factories and auto finance companies in "important African markets."⁵² The CAD Fund has similar joint ventures with the FAW Automobile Group, China Brilliance, and China North Vehicle Co., Ltd. As the president of the CAD Fund explained when the joint venture agreements were signed,

Chinese auto companies want to go overseas, and Africa is the best beach head...But due to the large geographic area and relatively scattered markets in Africa, it is too expensive for a single enterprise systematically to establish a complete production, marketing, and

⁴⁶ Zhang Chunyu and Tang Jun, "New Progress in China-Africa Financial Cooperation" (中非金融合作新进展), *East Asia Aspect*, 2014. Translation.

⁴⁷ CAD Fund was of the eight initiatives announced by President Hu Jintao at the 2006 FOCAC. (Zhang Chunyu and Tang Jun, "New Progress in China-Africa Financial Cooperation" (中非金融合作新进展), *East Asia Aspect*, 2014. Translation.)

⁴⁸ United Nations Office for South-South Cooperation, "China-Portugal Fund and Wanbao Africa Donate 100 Tons of Rice to Mozambique Disaster Area" (中非发展基金、中葡基金及万宝非洲向莫桑比克灾区捐赠百吨大米), March 28, 2019. Translation.

⁴⁹ The fund has invested in Liberia's iron ore mines and the DRC's copper and cobalt mines. In January 2010, the fund and the China Coal Geological Administration signed a strategic cooperation agreement for "joint development of African coal and other mineral resources." (China Coal Geology Administration, "China Coal Geology Administration and China-Africa Development Fund Cooperate to Develop African Minerals" (中煤地质总局与中非发展基金合作开发非洲矿产), January 19, 2010. Translation.) In March 2010, the CAD Fund and Wuhan Iron and Steel Group signed a strategic cooperation agreement on "investment and development of Africa's mineral resources." ("WISCO's Two Major Overseas Projects Approved, Adding 2 Billion Tons of Reserves" (武钢两大海外项目获批 新增 20 亿吨储备), *China News Network*, May 25, 2010. Translation.)

⁵⁰ China-Africa Development Fund. The fund's English-language website is accessible at: <http://en.cadfund.com/>.

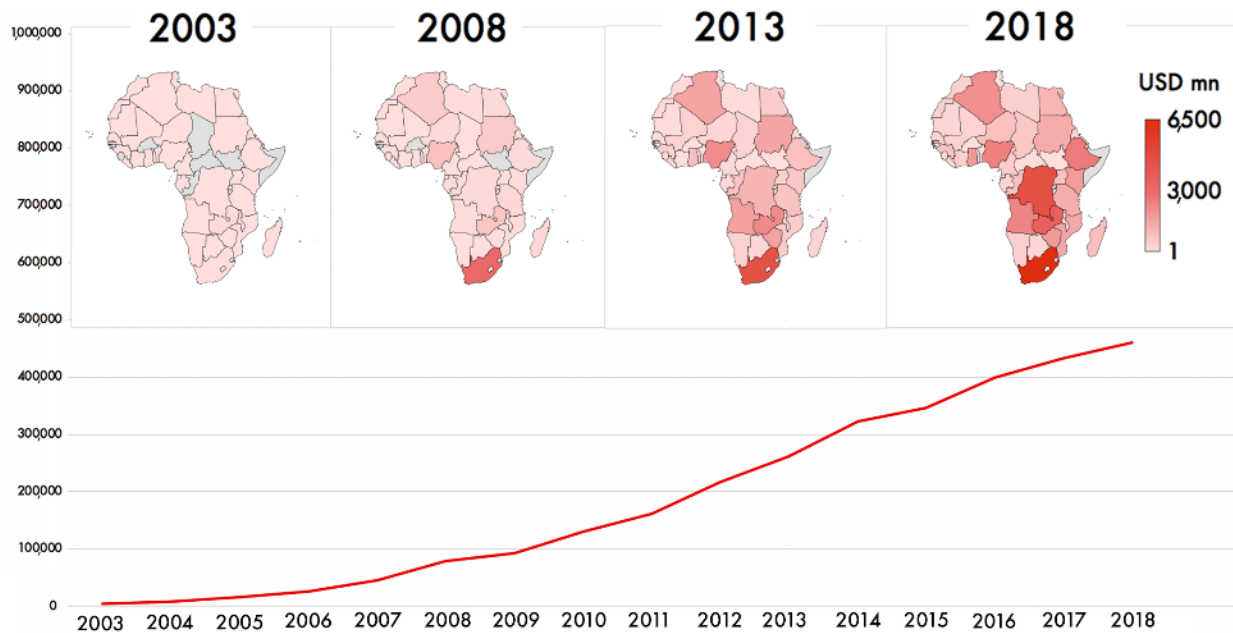
⁵¹ Data on CAD Fund investments comes from comprehensive collection of press releases from the CAD Fund website (cadfund.com) and media coverage spanning English-, French-, and Chinese-language press.

⁵² "Chery Automobile and China-Africa Development Fund Sign Strategic Cooperation Agreement" (奇瑞汽车与中非发展基金签署战略合作协议), *Gasgoo Comprehensive*, August 22, 2011. Translation.

service system... CAD Fund acts as a link to help the Chinese automobile industry ‘buy together’ in exploring the African market.⁵³

The CAD Fund has equivalent investments in appliances (e.g., the Hisense Home Appliances Park in South Africa, jointly invested with Hisense), the bio-economy (e.g., Mali Pharmaceutical, jointly invested with Wuhan Renfu Pharmaceutical), and materials (e.g., the Oriental Cement Plant in Ethiopia, jointly invested with Jiangsu Qiyuan Group).⁵⁴

Figure 4: China’s FDI Stock in Africa, 2003-2018 (USD million)⁵⁵



Non policy bank tools: China uses non-policy bank tools to propel investment in Africa as well: The China Export Credit Insurance Company, China UnionPay, China Investment Corporation, commercial banks, provincial governments,⁵⁶ SOEs, industrial zones, and subsidies to other commercial champions.⁵⁷ All these tools, mechanisms, and players overlap. For example, the CAD

⁵³ “China-Africa Fund Helps China’s Automobile Industry Hold Together to Develop African Market” (中非基金助力中国汽车业“抱团”开拓非洲市场), *People’s Daily*, December 12, 2012. Translation. The CAD Fund has also underwritten Brilliance Auto’s factory in Egypt, China National Heavy-Duty Truck’s in Nigeria, and FAW’s in South Africa. (CAD Fund).

⁵⁴ Data on CAD Fund investments comes from comprehensive collection of press releases from the CAD Fund website (cadfund.com) and media coverage spanning English-, French-, and Chinese-language press.

⁵⁵ “Chinese FDI Stock in African Countries,” China Africa Research Initiative, Johns Hopkins University School of Advanced International Studies.

⁵⁶ The National Development and Reform Commission has cooperation agreements with provinces – including Hebei, Jiangxi, Hubei, and Shandong – to “take advantage of Africa’s industrial development and explore cooperation with African countries through the committee-province collaborative linkage mechanism. That mechanism links Chinese provinces to African countries. (Gu Dawei, “China-Africa Three Networks, One Standardization and Production Capacity Cooperation Help Africa’s Industrialization Process,” (中非“三网一化”与产能合作助力非洲工业化进程) *China Investment*, 2016. Translation.) See *Figure 15: Consolidated Chinese-linked Physical Infrastructure Projects* on page 41 of this report.

⁵⁷ Zhang Chunyu and Tang Jun, “New Progress in China-Africa Financial Cooperation” (中非金融合作新进展), *East Asia Aspect*, 2014. Translation.

Fund signed a cooperation agreement with China Credit Insurance in 2016.⁵⁸ China Credit Insurance provides the insurance for the China EXIM Bank’s export buyer’s credit program.⁵⁹ China’s industrial cooperation zones in Africa are funded by SOEs, private companies, provincial governments, and policy banks. Chinese companies investing in Africa are also eligible for preferential policies. Conditions related to direct subsidies are listed in Figure 5.

*Figure 5: Preferential Policies for Direct Subsidies for Projects in African Countries*⁶⁰

Subsidy name	Application field	Description
Initial expenses	Legal partner, technical and business consulting fees, survey and investigation fees; project feasibility study report fee; purchase of normative documents and bids and other materials; data translation fees	Support upfront costs not exceeding 15% of the Chinese investment. The support ratio cannot exceed 50% of the upfront costs that can be supported
Resource return	Transportation insurance premiums paid for the return of agriculture, forestry, fishery, etc. within the output of rights and interests obtained by overseas resource development.	Subsidize at 20% of the actual payment
Go Out Personal Accident Insurance	Subsidization of overseas injury insurance for Chinese personnel working abroad	The insurance amount per person must exceed 500,000 RMB, and the support ratio cannot exceed 50% of the actual expenditure
Disposal expenses for overseas emergencies	A force majeure emergency outside the country poses a personal threat; temporary expenses related to going abroad	Implemented in accordance with the provisions of the Ministry of Finance’s 2001 “Expense Standards for Temporary Personnel Going Abroad”, and the subsidy standards are formulated by the Ministry of Foreign Affairs
Patent registration fees for overseas R&D centers	Overseas patent registration fees	50% of actual cost
Adaptive training costs for expatriate laborers	Enterprise subsidies for adaptability of foreign laborers	Cannot exceed 500 RMB per person

Chinese investments in Africa can seem patchwork. But it is clear that investment in Africa responds to Chinese government backing, direction, and incentive-shaping policies. The strategic orientation and mandate for action underpinning CAD Fund investments, including joint ventures, underlines as much, suggesting that Chinese companies’ activity in Africa is not wholly ad hoc.⁶¹

⁵⁸ “China-Africa Development Fund Signs 6 Cooperation Agreements with Africa Involving Cooperation in Infrastructure, Healthcare and Finance” (中非发展基金签署 6 个对非合作协议 涉及基建医疗和金融等领域合作), *Economic Daily*, September 7, 2018. Translation.

⁵⁹ Zhou Yukun, “Development Process of China’s Export Credit Insurance” (我国出口信用保险的发展进程), *Insurance Studies*, January 2019.

⁶⁰ Xu Lingbo and Yu Haonan, “The Experience and Challenges of Chinese Enterprises’ Investment in African Industrial Park: Taking Ethiopian Oriental Industrial Park as an Example” (我国企业对非洲产业园投资的经验与挑战: 以埃塞俄比亚东方工业园为例), *Shopping Mall Modernization*, 2019. Translation.

⁶¹ China’s negotiation of bilateral investment treaties with African partners further underscores the central support afforded to both State-backed and private investments. China has 13 active BITs with African partners. These constitute China’s engagement with Africa than that of the United States. For a historical and comparative treatment of China’s Africa BITs, see: Won Kidane, “China’s Bilateral Investment Treaties with African States in Comparative Context,” *Cornell International Law Journal*, Vol. 49, 2016.

More broadly, most large-scale Chinese construction and commercial activity in Africa is supported – whether directly or indirectly, via preferential policies or funding – by the Chinese government.⁶² Government support does not necessarily translate to direct oversight over individual projects. In areas that Beijing prioritizes, government incentives can foster duplication and inefficiencies.⁶³ But government incentives influence the direction and trends of activity, and do so according to a certain vision of Africa’s strategic value to Beijing.

Case Study: The Angola Model

China’s loan for oil program in Angola is emblematic of a pattern of exploiting natural resource reserves and fostering a cycle of indebtedness and dependency. Enabled partly by elite capture and graft, China’s predatory agreements with the country have limited Angola’s ability to sell to other trading partners, while significant pledges of investment have left the country little to show in the way of promised infrastructure but with burdensome debt.

China’s present ties to Angola grew out a program to establish energy security through diversification, as the country faced growing dependence on foreign oil after becoming a net importer in 1993.⁶⁴ “Exploiting oil import sources from the Middle East and Africa is the main content of China’s energy diplomacy,”⁶⁵ noted Yao Guimei, an Africa-focused expert at the Chinese Academy of Social Sciences, in 2003. Africa is particularly ripe for such exploitation. The continent accounts for approximately 10 percent of global oil production.⁶⁶ Some countries also actively encourage international investment: “African countries lack sufficient development funds themselves,” wrote Zou Lixing of the CDB in 2016, “so they take preferential measures to attract foreign investment”⁶⁷ (Appendix B.4).

In the late 1990s, China launched a campaign of trade and development lending targeted at oil-producing African countries. China’s Global Energy Network Development Cooperation Organization writes that between 1995 and 2003, “China relied on traditional Sino-African friendly relations, assistance, preferential loans, and other means quickly to realize and expand oil imports from Sudan, the DRC, Angola, Nigeria, Gabon, and Equatorial Guinea.”⁶⁸ At the same time, Beijing invested directly in African oil projects (e.g., the Muced Basin in Sudan).⁶⁹

⁶² The action plan issued at the 2015 FOCAC declared that “The Chinese side will encourage Chinese financial institutions to provide financing and insurance support for China-Africa cooperation in energy, mining, agricultural, processing, manufacturing, shipping, metallurgy, construction materials, information and communication technology, electricity, railways, highways, ports, and airports.” (The Forum on China-Africa Cooperation, Johannesburg Action Plan (2016-2018), December 25, 2015.)

⁶³ In fintech, Transsion’s PalmPay and Chinese-funded O-Pay are poised to compete against each other in Nigeria.

⁶⁴ Sergei Trough, “China’s Changing Oil Strategy and its Foreign Policy Implications,” Brookings Institution, September 1, 1999.

⁶⁵ Yao Guimei, “Strategic Consideration on Exploitation and Utilization of African Mineral Resources” (关于开发利用非洲矿产资源的战略思考), *West Asia and Africa*, 2003. Translation.

⁶⁶ U.S. Energy Information Administration (EIA), International Country and Region Production Data.

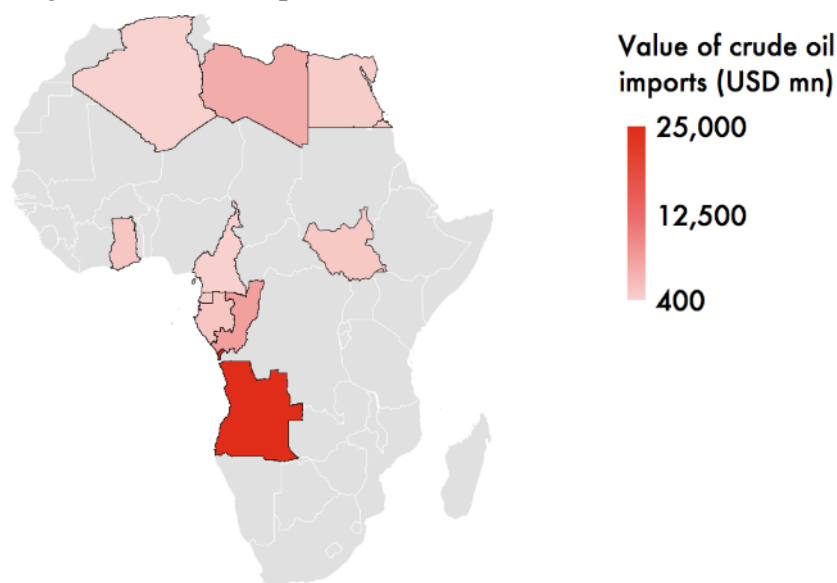
⁶⁷ Zou Lixing, “The Emerging China-Africa Energy Cooperation” (新兴中的中非能源合作), *International Finance*, 2016. Translation.

⁶⁸ Zhang Rui, “The History of China’s Energy Diplomacy and the Characteristics of the New Era” (中国能源外交历史与新时代特征), *Peace and Development*, 2020. Translation.

⁶⁹ Zhang Rui, “The History of China’s Energy Diplomacy and the Characteristics of the New Era” (中国能源外交历史与新时代特征), *Peace and Development*, 2020. Translation.

In 2004, Beijing launched concentrated efforts in Angola with a loan-for-oil model, commonly referred to as the Angola Model. Between 2004 and 2007, China’s EXIM Bank provided the Angolan government with more than \$7.5 billion in oil-backed credit lines.⁷⁰ Those lines of credit expanded the two countries’ trading relationship and Beijing’s influence. They also coincided with growing Chinese direct investment in Angola’s oil infrastructure. In 2004, State-owned China Petroleum and Chemical Corporation (Sinopec) began purchasing production rights of Angolan oil blocks.⁷¹ Such investment accelerated later in the decade.⁷² Between 2002 and 2012, Angola’s share of China’s crude oil imports climbed from 8.2 to 14.8 percent.⁷³ The figure has held steady since. In July 2019, Angola was the top crude supplier to China’s independent refineries.⁷⁴ Only Russia and Saudi Arabia regularly serve as more significant suppliers to China.⁷⁵

Figure 6: China’s Top 10 Oil Sources in Africa, 2018⁷⁶



China’s oil diplomacy and investment in Angola have fostered dependence. China is Angola’s top export market. Angolan officials have expressed concerns about their reliance on China.⁷⁷ They have called for diversification of the country’s economy and trading partners but dependence risks being a self-fulfilling prophesy; its inertia has proved difficult to escape.⁷⁸

⁷⁰ Yao Guimei, “Main Models and Challenges of Sino- Africa Investment Cooperation” (中国对非洲投资合作的主要模式及挑战), *West Asia and Africa*, 2013. Translation.

⁷¹ “China’s Oil and Mineral Deals in Africa,” *Reuters*, October 22, 2010.

⁷² In 2009 and 2010, respectively, Sinopec and CNOOC expanded its role in Angola’s Blocks 18 and 32.

⁷³ That jump is all the more remarkable the increase in China’s crude oil imports during that period.

⁷⁴ “Angola Emerges as Top Crude Supplier to China’s Independent Refineries,” *S&P Global*, August 5, 2019.

⁷⁵ UN Comtrade: International Trade Statistics Database. United Nations.

⁷⁶ UN Comtrade: International Trade Statistics Database. United Nations.

⁷⁷ Ryotaro Sato, “Angola looks beyond China for Aid and Investment: Technology Transfer and Diversifying Economy are Key, Says Energy Minister,” *Nikkei Asian Review*, December 15, 2018.

⁷⁸ Or, as China’s Global Energy Network Development Cooperation Organization puts it, “China was able to obtain a long-term stable and affordable oil supply in a timely manner, which...drove China’s engineering, contracting,

China has faced related criticism for the Angola model as a form of predatory lending. Angola's obligations through the model decrease the volume of oil that it can sell to other trading partners, therefore its cash flow and the corresponding value of its currency.⁷⁹ The loan for oil model also makes Angolan solvency dependent on the price of oil. When the price of oil plummeted in 2008, Angola, bound by loan terms set when the price of oil had been much higher, found itself borrowing money to repay Beijing.⁸⁰ As a 2018 *Axios* feature put it:

Angola is an example of the debt-trap in Chinese diplomacy, through which small countries accrue massive debts by accepting Beijing's offer to build much-needed infrastructure. Then China has leverage to set the terms of future engagement.⁸¹

Such criticism is acknowledged in Chinese discourse.⁸² And Beijing has diversified its approach to investment in African resources, including through swaps in which governments award Chinese actors resource development production licenses in exchange for capital to build relevant infrastructure.⁸³ But the Chinese government may not altogether have rejected the Angola Model. A 2019 article by researchers at the Development Research Center of China Geological Survey and Hebei Province's Geological Survey Institute praises the Angola Model and calls for it to be applied to Angola's mining, as well as oil, resources.⁸⁴

Chinese engagement in Angola coincides with, and may directly benefit from, graft and elite capture. Entities through which Chinese actors invest into and partner on projects in Angola's energy and infrastructure sectors have been targets of fraud investigations.⁸⁵ The recent case of Isabel dos Santos, daughter of the former, long-time Angolan president Jose Eduardo dos Santos, offers a glaring example. Authorities have alleged that Isabel dos Santos, a former board member of Sonangol – Angola's State-owned petroleum and natural gas company – and her husband improperly funneled over \$1 billion to accounts and companies they controlled.⁸⁶ Those funds, and other firms that have partnered with dos Santos-linked enterprises, have a variety of ties to China.⁸⁷ Additionally, the Hong Kong-domiciled China International Fund (CIF) was implicated

equipment, and labor services to Go Out.” (Zhang Rui, “The History of China's Energy Diplomacy and The Characteristics of the New Era” (中国能源外交历史与新时代特征), *Peace and Development*, 2020. Translation.)

⁷⁹ In returning oil to China rather than selling it, Angola lost a critical source of cash, sparking massive inflation. (Eric Olander, “China's Infrastructure Finance Model is Changing.” *The Africa Report*, January 14, 2020.)

⁸⁰ Eric Olander, “China's Infrastructure Finance Model is Changing.” *The Africa Report*, January 14, 2020; “Angola's Debt-Reliance on China May Leave It Short-Changed,” *Financial Times*, June 13, 2018.

⁸¹ Erica Pandey, “Angola's Chinese Oil Debt-Trap,” *Axios*, May 13, 2018.

⁸² Yao Guimei. “Main Models and Challenges of Sino- Africa Investment Cooperation” (中国对非洲投资合作的主要模式及挑战), *West Asia and Africa*, 2013. Translation.

⁸³ Eric Olander, “China's Infrastructure Finance Model is Changing.” *The Africa Report*, January 14, 2020.

⁸⁴ The article is funded by the Belt and Road Energy and Important Mineral Resources Exploration and Development Tracking and Achievement Integration Project. (Sun Renbin et al., “Analysis of Angola's Mineral Resources and Mining Investment Environment” (安哥拉矿产资源及矿业投资环境分析), *China Mining*, 2019. Translation.)

⁸⁵ It is possible that some of the more high-profile recent cases will prove fraudulence by Angolan actors and not their Chinese interlocutors; it is also possible that ongoing investigations will demonstrate clear causal relationships between on-the-ground corruption in Angola and Chinese interests. Regardless of individual legal investigations, it is clear that Chinese actors interact within proximity of questionable practices.

⁸⁶ “Angola's dos Santos Wants Graft Case Dropped, Cites Documents She Calls Forged,” *Reuters*, May 12, 2020.

⁸⁷ Sydney P. Freedberg, Scilla Alecci, Will Fitzgibbon, Douglas Dalby and Delphine Reuter, “How Africa's Richest Woman Exploited Family Ties, Shell Companies and Inside Deals to Build an Empire,” *ICIJ Luanda Leaks*, January 19, 2020.

in connection to funds seized in 2020 by Angolan authorities from corrupt officials, including a former officer of the Angolan Presidential Guard.⁸⁸ Collaborations between CIF and Sonangol have been documented as central financial vehicles utilized by the “88 Queensway Group” in financing Chinese-backed projects in Angola.⁸⁹

Minerals: Consolidating Control over Supply on the African Continent

In 2018, oil and minerals accounted for 84 percent of China’s overall imports from countries in Africa.⁹⁰ (Appendix B.2) Chinese companies own or invest in at least 77 mines in Africa.⁹¹ Yao Guimei of the Chinese Academy of Social Sciences calls Africa the “world’s treasure trove” of mineral resources.⁹² The continent is home to approximately 30 percent of the world’s known mineral resources, including about three quarters of global platinum and cobalt supply.⁹³ China actively imports, invests in, and builds industry chains on those mineral resources.

This chapter documents China’s investment in Africa’s mineral resources, exploring the typology of actors implementing those investments, as well as their relationships among themselves, to the Chinese government, and along the mineral value chain. The chapter describes horizontal and vertical integration of China’s mineral operations in Africa. This chapter also uses trends in Chinese discourse to outline the strategic patterns and ambitions animating Chinese engagement with Africa’s mineral resources – namely a Two Markets, Two Resources-inspired aim to influence global markets, especially for mineral resources whose supply is relatively consolidated on the African continent.

⁸⁸ Toh Han Shih, “Chinese Investments at Risk in Angolan Anti-Graft Campaign” *Asia Sentinel*, February 19, 2020.

⁸⁹ The 88 Queensway Group refers to a group of investment and operating company entities that shared a single registration address in Hong Kong and have been documented to have SOE and Chinese government ties. The group of entities contributed as seemingly non-governmental sources to the financing of a range of projects in Angola. See: Lee Levkowitz, Marta McLellan Ross, and J.R. Warner, “The 88 Queensway Group: A Case Study in Chinese Investors’ Operations in Angola and Beyond,” U.S.-China Economic and Security Review Commission, July 10, 2009.

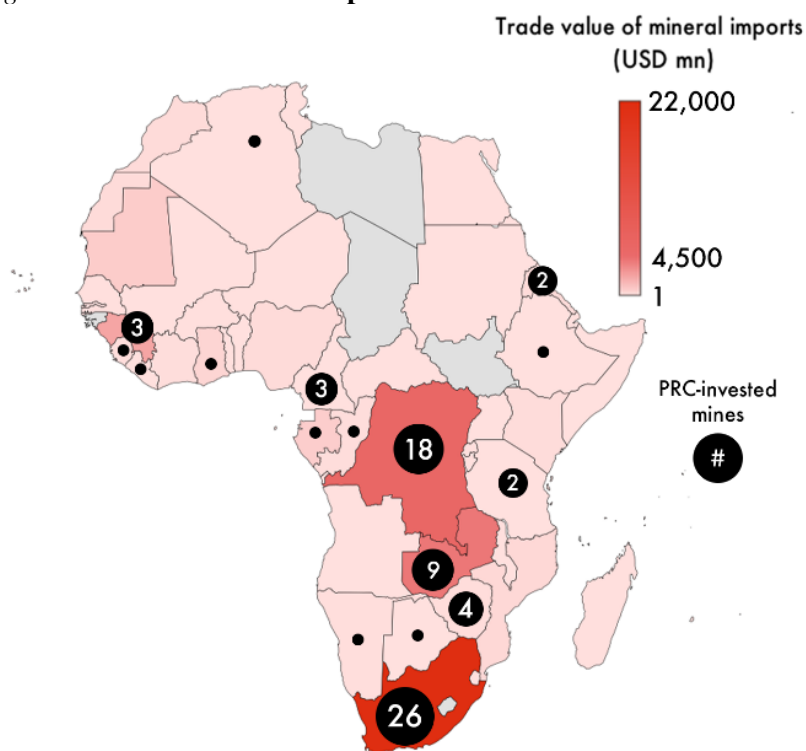
⁹⁰ People’s Republic of China Ministry of Commerce, “Statistics on China-Africa Trade in 2018,” January 26, 2019.

⁹¹ Mine ownership data includes operational mines and those under development. Excluded are examples where investments have been announced but no documented operations can be verified. Also excluded are partnerships that are limited to offtake agreements and legacy, minority stakes established by Hong Kong-domiciled entities prior to 2019. Data is aggregated from sources including the Economist Intelligence Unit, Business Monitor International, Extractives Hub, and reporting from international institutions including the World Bank and International Monetary Fund. Company data is sourced from company public disclosures and financial records, press releases, and scrutiny of official entity ownership registrars in China and internationally. Other existing analyses underestimate this figure. A Baker Mackenzie report from January 2020, for example, estimated that China had invested in 24 mines in Africa. (“China Aims for Win-Win Partnership with African Mining Sector, Baker Mackenzie,” January 24, 2020). The divergence is in part a function of the exhaustive data collection undertaken for this report’s analysis. It is also a function of a methodology that identifies mines owned by Chinese-invested companies (e.g., Ivanhoe Mines, a Canadian company whose major shareholders are Chinese State-owned CITIC Group Corporation and Zijin Mining Group Co., Limited) rather than only directly Chinese-owned mines. (Annual Report 2019, Ivanhoe Mines, March 30, 2020)

⁹² Yao Guimei, “Strategic Consideration on Exploitation and Utilization of African Mineral Resources” (关于开发利用非洲矿产资源的战略思考), *West Africa*, 2003. Translation.

⁹³ British Geological Services’s World Mineral Statistics Database; Li-Ion In Zion, “Africa must assume its place in the global battery race,” *The Africa Report*, January 7, 2020.

Figure 7: China's Mineral Import Sources and Mine Investments⁹⁴



China's top mineral imports by value from Africa are silver, gold, copper, diamond, aluminum, iron and steel, cobalt, manganese, and platinum.⁹⁵ China's top import sources are South Africa, the DRC, Zambia, Guinea, and Mauritania. Chinese investments in African mines are similarly distributed. The majority are in South Africa (26), the DRC (18), and Zambia (9). 27 China-invested mines in Africa produce copper, 20 gold, and 15 palladium and platinum.⁹⁶ Copper is a necessary material for electric motors and machinery insulation more broadly. Platinum group

⁹⁴ Mine ownership data is aggregated from a range of sources including the Economist Intelligence Unit, Business Monitor International, Extractives Hub, and reporting and analysis from international institutions including the World Bank and International Monetary Fund. Company data is sourced from company public disclosures and financial records, press releases, and scrutiny of official entity ownership registrars in China and internationally. This aggregation excludes projects that have been announced but for which documentation of active operations could not be verified, partnerships that are limited to offtake agreements, and minority positions held by Hong Kong-domiciled entities prior to 2019. Trade data is aggregated from UN Comtrade: International Trade Statistics Database, United Nations based on 2018 data.

⁹⁵ UN Comtrade: International Trade Statistics Database. United Nations. "Mineral imports" refers to imports of alumina, antimony, bismuth, cadmium, chromite, cobalt, copper, gallium, germanium, gold, hafnium, indium, iron and steel, lead, manganese, molybdenum, niobium, platinum, rhenium, rare earths, silver, tantalum, thallium, tin, titanium, vanadium, zinc, and zirconium.

⁹⁶ These total figures are poised to evolve – and likely increase – in the months ahead as COVID-19's market shocks prompt change in the global mining landscape. (Alycia MacDonald, "COVID19 Mining Impacts Mining Projects with At Risk Production," *S&P Global*, 13 July 2020.) For example, Banro Corporation agreed in June to sell a DRC gold mine to Shomka Resources Ltd, invested in by China's Baiyin International Investments. (Helen Reid, "Banro Agrees Sale of Troubled Namoya Gold Mine in Congo," *Reuters*, June 23, 2020.) And Shandong Gold has announced its purchase of Cardinal Resources, which operates in Ghana. (Tom Daly, "China's Shandong Gold to Buy Ghana-Focused Cardinal Resources for \$221 Million," *Reuters*, June 18, 2020.)

metals, which include both palladium and platinum,⁹⁷ are critical inputs for products ranging from fertilizers to fuel efficient vehicles to electronics.

The first known Chinese investment in an African mine came in 1998, when China Nonferrous Metal Mining Group (CNMC) acquired an 85 percent stake in Zambia’s then-shuttered Chambishi copper-cobalt mine.⁹⁸ A lull followed over the next decade before a spate of Chinese investments after the 2009 financial crisis, another after global mineral prices plunged in 2015, and the most significant uptick to date in 2019. Chinese companies invest in Africa’s mines both directly (e.g., the Jinchuan Group holds majority stakes in four DRC mines and one Zambian mine) and indirectly, by acquiring stakes in other companies that own mines. For example, Zijin Mining and State-owned CITIC Metal together hold just over 40 percent of Canada’s Ivanhoe Mines – which owns controlling stakes in South Africa’s Platreef platinum and palladium mine, the DRC’s Kapushi Zinc mine, and the DRC’s Kamao-Kakula copper mine.⁹⁹

*Figure 8: China’s Share of Copper, Cobalt, Platinum, and Gold Exports from the DRC, South Africa, and Zambia, 2018*¹⁰⁰

	Copper (%)	Cobalt (%)	Platinum (%)	Gold (%)
DRC	6.9 ¹⁰¹	86.5	-	52.8
South Africa	37.8	41.4	8.2	45.9
Zambia	80.5	62.7	-	-

Reported trade statistics suggest that China claims significant shares of mineral – especially copper, cobalt, and gold – exports from the major producers in whose mines it invests (Figure 8). To that crude mineral input access, China adds the greatest corresponding refining and production capacity in the world (Figure 9, Appendix A).¹⁰² China establishes a position at every step of the mineral supply chain.

⁹⁷ As well as rhodium, ruthenium, and iridium.

⁹⁸ China Nonferrous Metals Group, “President Lungu Cut the Ribbon in the Production Commencement Ceremony of South East Ore Body of NFC Africa Mining,” August 27, 2018. Chambishi was also the first overseas nonferrous metal mine developed by a Chinese company. (Ibid.)

⁹⁹ Zijin Increases Ivanhoe Stake, *Mining Journal*, October 9, 2019.

¹⁰⁰ Trade data is collected from UN Comtrade: International Trade Statistics Database. Cobalt is defined as “cobalt ores and concentrates” as well as “cobalt: mattes and other intermediate products of cobalt metallurgy, cobalt and articles thereof;” copper is defined as “copper ores and concentrates,” “copper mattes,” and “copper; unrefined, copper anodes;” platinum is defined as “platinum; unwrought or in semi-manufactured forms, or in powder form;” gold is defined as “gold (including gold plated with platinum) unwrought or in semi-manufactured forms, or in powder form.” Trade flows are based on reporting by the importing countries. Export share is assessed by value. Methodology is inspired by Susan van den Brink et al., *Identifying Supply Risks by Mapping the Cobalt Supply Chain, Resources, Conservation, and Recycling*, May 2020.

¹⁰¹ 93 percent of the DRC’s copper exports go to Zambia. China claims an 80.5 percent share of Zambia’s copper exports. (UN Comtrade: International Trade Statistics Database.)

¹⁰² T.J. Brown et al., “World Mineral Production 2014-2018,” British Geological Survey, 2020.

Figure 9: Copper Production, Processing, and Refining of Top African Producers, China, and the United States, 2018¹⁰³

	Mine production (tons, metal content)	China's share of reported exports (%)	Smelter production of copper (tons, metric)	Production of refined copper (tons, metric)
DRC	1,225,227	6.9 ¹⁰⁴	-	999,513
Zambia	851,089	80.5	828,700	458,200
South Africa	46,900	37.8	33,300	43,900
Mauritania	28,138	100	-	-
Morocco	23,859	8.1	-	-
China	1,591,000	-	6,357,400	9,028,555
United States	1,250,000	31.5	536,000	1,070,000
World	20,600,000		16,500,000	23,900,000

Building Integrated Industrial Chains

SOEs undertake the majority of China's investment – especially direct investment – in African mines.¹⁰⁵ In almost 80 percent (61) of the 77 identified cases of Chinese entities investing in or owning mines in Africa, the Chinese investor is, or investors are, State-owned.¹⁰⁶ The four Chinese companies with the most documented majority stakes in African mines are Jinchuan Group, CNMC, Zijin Mining, and China Minmetals, through its subsidiary MMG Limited.¹⁰⁷

¹⁰³ Mine production, smelter production, and refined copper production is collected from the British Geological Services's World Mineral Statistics Database (<https://www.bgs.ac.uk/>). Trade data is collected from UN Comtrade: International Trade Statistics Database, with copper defined as “copper ores and concentrates,” “copper mattes,” and “copper; unrefined, copper anodes.” Trade flows are based on reporting by the importing countries. Export share is assessed by value. Methodology is inspired by Susan van den Brink et al., Identifying Supply Risks by Mapping the Cobalt Supply Chain, *Resources, Conservation, and Recycling*, May 2020.

¹⁰⁴ 93 percent of the DRC's copper exports go to Zambia. China claims an 80.5 percent share of Zambia's copper exports. (UN Comtrade: International Trade Statistics Database.)

¹⁰⁵ Chinese mine investment totals have been aggregated through scrutiny of Chinese, English, and French language press coverage of African mine investments with external validation sourced from investment and operator company press releases, financial disclosures, including SEC 13D and 13G filings accessible at the Security and Exchange Commission's EDGAR Search Database, and registrations maintained in Chinese business data services, including annual reports filed with the China Securities Regulatory Commission. This aggregation excludes projects that have been announced but for which documentation of active operations could not be verified, partnerships that are limited to offtake agreements, and minority positions held by Hong Kong-domiciled entities prior to 2019.

¹⁰⁶ An exception is Sichuan Hongda Group, which holds 80 percent stakes in Tanzania's Liganga iron ore and Mchuchuma coal mines. Sichuan Hongda is a private company. Its chairman and legal representative, Liu Canlong, is well connected to the Chinese Party and government system. His positions include serving as a deputy to the Tenth and Eleventh National People's Congress and Vice Chairman of the Tenth National Federation of Industry and Commerce. (“Liu Canglong” (刘沧龙), *Beijing News*, September 18, 2017. Translation)

¹⁰⁷ The Jinchuan Group holds majority stakes in four DRC copper mines, as well as one in Zambia. Jinchuan's joint venture with CAD Fund, Wesizwe Platinum Limited, operates in South Africa. CNMC holds a majority stake in five copper mines in Zambia, as well as in the DRC's Deziwa copper and cobalt mine. CNMC's subsidiary, CNMC Foreign Engineering and Construction, holds an almost 20 percent stake in Terramin Australia, which itself claims a majority stake in Algeria's Tala Hamza lead and zinc mine. Zijin Mining holds a majority stake in copper mines in Eritrea and the DRC as well as stakes in Canada's Ivanhoe Mining which itself invests in African mines. MMG Limited, a subsidiary of China Minmetals, owns three copper mines in the DRC.

These State-owned companies also build and operate processing facilities. In many cases they do so collaboratively, creating integrated supply chains among their mining, processing, and trading operations. CNMC offers a long-standing example.¹⁰⁸ As of July 2019, it has invested more than \$3 billion in Central South Africa, primarily in Zambia and the DRC. CNMC owns more than 20 subsidiaries in the region, owns mines and runs copper smelters, and operates a national-level overseas economic and trade cooperation zone.¹⁰⁹ Through these investments, CNMC has established a presence at every step of the copper and cobalt value chain, from processing rock to producing copper and cobalt concentrate, to drying and smelting, to manufacturing copper cathodes, to exporting those and turning them into copper-based electrical products.¹¹⁰ CNMC's Chambishi mine in Zambia is integrated with CNMC-owned processing plants, as well as a CNMC-owned economic and trade cooperation zone that focuses on the mining industry and trade.¹¹¹ CNMC's other mines connect to that operation, as well: The cobalt hydroxide from the Zambia Baluba mine is shipped to CNMC's Chambishi processing plant for recovery.¹¹² CNMC also invests in transportation infrastructure (e.g., access roads) to connect its mining and processing operations.¹¹³ In April 2019, CNMC opened a new channel for transporting cathode copper products via the Tanzania-Zambia Railway.¹¹⁴

CNMC's integrated supply chains encompass other Chinese players, as well. Copper produced at the Jinchuan Group's Chibulama South Mine in Zambia is sold, according to an off-take agreement, to CNMC's Chambishi copper smelter. Jinchuan International purchases the copper blister

¹⁰⁸ As CNMC put it in a June 2019 press release, "CNMC currently has three production lines in the DRC for cathode copper, copper concentrate, and cobalt hydroxide, forming a multi-variety mineral product production chain that integrates mining, beneficiation, and smelting." (China Nonferrous Metals Group, "Congo Company's First Batch of Cobalt Products Produced Smoothly" (刚果公司第一批钴产品顺利产出), June 16, 2019. Translation.)

¹⁰⁹ CNMC's presence in Zambia builds off the Chambishi Mine, of which it purchased an 85 percent stake in 1998. CNMC invested in the Chambishi Wet Process Smelter in 2004, the Sino-Metals Leach Plant in 2005, and the Chambishi Copper Smelter in 2006. In 2007, CNMC established the Zambia China Economic and Trade Cooperation Zone (ZCCZ), China's first industrial zone in Africa. The ZCCZ's Chambishi West Zone focuses on developing the nonferrous metal industry, as well as the supporting industrial chain and service industry. (China Federation of Industry and Commerce, "Zambia China Economic and Trade Cooperation Zone" (赞比亚中国经济贸易合作区), April 28, 2020. Translation.) Wang Changming of CNMC describes a Central and Southern Africa strategy based on "regional linkage between the DRC and Zambia." (Wang Changming, "The Bridge Connecting the Chinese Dream and the African Dream: Summary of China Nonferrous Mining Group Co., Ltd.'s investment and Development in Africa" (衔接中国梦和非洲梦的桥梁: 中国有色矿业集团有限公司在非洲投资发展情况概要), *China Metal Bulletin*, 2016. Translation.)

¹¹⁰ Peter Kragelund, "Part of the Disease or Part of the Cure? Chinese Investments in the Zambian Mining and Construction Sectors," in Spencer Henson, Fiona Yap (eds.) *The Power of the Chinese Dragon: Implications for African Development and Economic Growth*, Palgrave Macmillan, November 16, 2015.

¹¹¹ China Nonferrous Mining Corporation Limited, "Interim Report," 2018.

¹¹² "Baluba, U.S. Geological Survey," Mineral Resource Data System. Some of CNMC's mines, like the Muliashi mine, host their own processing plants. (China Nonferrous Mining Corporation Limited, "Interim Report," 2018.)

¹¹³ Examples include the road project of the Msongpo Village in the DRC completed in November 2018 and the RTR Road project, also in the DRC. ("Mazongpo Access Road Built by Dizwa Mining Has Achieved Interim Results" (迪兹瓦矿业援建的马松坡进村道路取得阶段性成果), *China Nonferrous Metal News*, November 14, 2018. Translation; "CNMC Undertakes Construction of RTR Project in DRC" (中色股份承建刚果(金) RTR 项目), *China Nonferrous Metal News*, July 30, 2018. Translation.)

¹¹⁴ "Luanxia Opens a New Railway Transportation Channel in China" (中色卢安夏开辟铁路运输新通道), *China Nonferrous Metal News*, September 26, 2019. Translation.)

produced at that smelter for its minerals and trading business.¹¹⁵ In some cases, similar agreements are formed with non-Chinese partners. In 2015, CNMC subsidiary China Nonferrous Industry's Foreign Engineering and Construction (NFC) organized financing for the Eurasian Resources Group's (ERG's) Metalkol copper and cobalt project in the DRC. The financing agreement reportedly required that Metalkol's copper cathode production be sold to NFC.¹¹⁶

Integration among Chinese players in the industrial chain does not end at mineral processing or transportation. The CNMC-sponsored Zambia China Economic and Trade Cooperation Zone (ZCCZ) creates a platform for the downstream industrial chain, services, logistics, and trade. The zone is divided into two parks: Chambishi and Lusaka. The Chambishi park supports mining-based industries. The Lusaka Division focuses on international logistics, high-end residential development, appliances, light industry, food processing, and whole-sale building materials, grain, oil, and commodities.¹¹⁷ Through preferential policies and strategic agreements, the Zone has attracted dozens of Chinese companies, State-owned and private. Those include mining, surveying, and prospecting companies, as well as enterprises involved in logistics and trading, copper cathode production, and anticorrosive material production.¹¹⁸

Chinese discourse defines industrial chain partnerships among Chinese enterprises as “strategic alliances.” A 2018 article in *China Mining*, written by researchers affiliated with State-owned Sinomine,¹¹⁹ describes “strategic alliances with upstream and downstream¹²⁰ enterprises in the industrial chain” and “active cooperation” among them.¹²¹ “Only by virtue of the joint efforts

¹¹⁵ Jinchuan Group International Resources Co., Ltd, “Investor Report,” September 2018. Similarly, Jinchuan Copper sells the oxide ore from its Musonoi Mine to a smelter built and operated by Chengtun Mining, another Chinese company. All of the cobalt hydroxide produced at Jinchuan's Ruashi Mine is sold to Jinchuan or its affiliates. (Ibid.) These supply chain relationships also extend outside of Africa. Since the Zambian government imposed a 5 percent import tax on copper concentrates entering Zambia in January 2019, the Jinchuan Group has shipped those produced at its Kinsenda mine in the DRC to China-based, rather than DRC-based, refineries. (Jinchuan Group International Resources Co., Ltd, “Investor Report,” May 2019.)

¹¹⁶ “The Deal for Deziwa,” *Global Witness*, August 2020.

¹¹⁷ China Federation of Industry and Commerce, “Zambia China Economic and Trade Cooperation Zone” (赞比亚中国经济贸易合作区), April 28, 2020. Translation.

¹¹⁸ China Federation of Industry and Commerce, “Zambia China Economic and Trade Cooperation Zone” (赞比亚中国经济贸易合作区), April 28, 2020. Translation.) Examples include China National Africa Mining Co., Ltd; China Color Africa Logistics Trading Co., Ltd; Boluo Mining Investment Co., Ltd; Qianfan Anticorrosive Technology Service Company; Wanbang ZTE; and Changsheng Mining Equipment Co., Ltd. (Ibid)

¹¹⁹ Sinomine is a geological prospecting engineering company that assists Go Out State-owned mining companies.

¹²⁰ “Upstream” refers to earlier points in the industrial production chain; “downstream” to later ones. For example, “upstream” often delineates raw material inputs and “downstream” steps toward a finished product.

¹²¹ That article cites Sinomine's strategic alliances with CNMC, China Metallurgical Group Resources Development Co., Ltd, China North Industries Corporation, Jinchuan Group, and Zijin Mining Group in mining and processing; the Liaoning Nonferrous Geological Bureau and Heilongjiang Provincial Nonferrous Metals Geological Prospecting Bureau, Jilin Nonferrous Metals Geological Prospecting Bureau, Northwest Nonferrous Geological Prospecting Bureau, and Beijing Geological Research Institute of Nuclear Industry in geological prospecting. (Zhang Jinwei et al., “Exploration of Overseas Business Model of Geological Exploration Enterprises: Taking China Mining Resources as an Example” (地勘企业海外经营模式探索:以中矿资源为例), *China Mining*, 2019. Translation.)

among enterprises in forming industrial clusters and industrial agglomeration,” reads the article, “can they occupy a place in the international market.”¹²²

Long Term Position over Short Term Profit

Trends in China’s mining activity in Africa suggest a willingness to shoulder short term losses as well as losses at certain nodes in the value chain for the sake of strategic positioning and long-term profit. For example, CNMC’s Chambishi investments have lost money.¹²³ Chinese companies have also consistently followed patterns of investing in African mines during market slumps, incurring immediate losses but also benefiting from bargain prices. CNMC acquired the Baluba and Muliashi copper mines in 2009, after a steep drop in global copper prices forced them to close.¹²⁴ This was just one example in a larger slate of Chinese investments in Africa’s mines during the 2008-2009 financial crisis.¹²⁵

A similar countercyclical pattern held in 2015. Copper fell from \$10,000 per ton in 2011 to \$4,300 in 2016.¹²⁶ In 2015, China’s Zijin Mining Group, acquired a half interest in the Kamo copper project in the DRC, as well as a 60 percent stake in Australia’s NKWE Platinum, owner of the Bushveld Complex in South Africa. In 2016, CNMC announced construction of two major smelters in the DRC. That year, almost no mining projects that were not China-invested were hiring in the DRC.¹²⁷ Today, as COVID-19’s reverberations depress global prices, Chinese mining companies seem to be increasing their appetite for overseas acquisitions. In early March 2020, State-owned Zijin Mining Group, Ltd acquired Canada’s Continental Gold Inc. In May, State-owned Shandong Gold Mining and Toronto-listed TMAC Resources formed an acquisition

¹²² Zhang Jinwei et al, “Exploration of Overseas Business Model of Geological Exploration Enterprises: Taking China Mining Resources as an Example” (地勘企业海外经营模式探索:以中矿资源为例), *China Mining*, 2019. Translation.

¹²³ After losing money from 1998 until 2005, the Chambishi mine, copper smelter, and Sino-Meals leaching plant did manage to turn a profit of \$500 million between 2006 and 2014. But the project suffered a \$280 million loss in 2015 alone. Trends in copper prices and known figures on operating costs suggest that it has remained in the red since. (Barry Sautman and Yan Hairong, “Chinese Mining in Africa and its Global Controversy.” In Saleem H. Ali, Kathryn Sturman, Nina Collins (Eds), *Africa’s Mineral Fortune: The Science and Politics of Mining and Sustainable Development*, Routledge: 2018.)

¹²⁴ “CNMC Plans to Bring Muliashi Back into Production by 2012,” *Metal Bulletin*, Apr 26, 2010.

¹²⁵ “Jean-Raphael Chaponniere, China and Africa: The Mining Challenge,” *Afrique Contemporaine*, 2013. The *China Mining* piece by Sinomine researchers explains that their company “believed that the downturn in the market was the best time to enter the overseas expansion of mineral resources... Sinomine entered the Zambian Chambishi Copper Mine Geological Exploration Project during the global copper price drop and the Zambian copper industry’s mining crisis. This counter-cyclical development strategy allows companies to seize strategic opportunities and obtain quality overseas projects.” (Zhang Jinwei et al, “Exploration of Overseas Business Model of Geological Exploration Enterprises: Taking China Mining Resources as an Example” (地勘企业海外经营模式探索:以中矿资源为例), *China Mining*, 2019. Translation)

¹²⁶ Barry Sautman and Yan Hairong. “Chinese Mining in Africa and its Global Controversy.” In Saleem H. Ali, Kathryn Sturman, Nina Collins (Eds), *Africa’s Mineral Fortune: The Science and Politics of Mining and Sustainable Development*, Routledge: 2018.

¹²⁷ Barry Sautman and Yan Hairong. “Chinese Mining in Africa and its Global Controversy.” In Saleem H. Ali, Kathryn Sturman, Nina Collins (Eds), *Africa’s Mineral Fortune: The Science and Politics of Mining and Sustainable Development*, Routledge: 2018.

agreement. In June, Shandong agreed to purchase Australia-based Cardinal Resources.¹²⁸ Shandong increased its bid in September 2020.¹²⁹

Losses in either the short term or upstream industry chain nodes might be considered “loss-leaders;” sacrifices for the sake of larger, more profitable footholds in the longer term or downstream, higher value add portions of the supply chain. In some cases, the larger profit to be reaped from such sacrifices is a function of integrated supply chains. For example, CNMC derives value from its Chambishi investments throughout the downstream value chain built on them even if those investments themselves do not turn a profit. Examples exist in which Chinese companies are able to take advantage of poor market conditions thanks to government financial backing. On March 8, 2016, China Development Bank and CAD Fund promised some \$3 billion of funding to CNMC.¹³⁰ According to press releases, that funding was intended to help “expand its business in central and southern Africa and implement its Go Out strategy in depth.”¹³¹ In June 2016, the DRC’s State-owned Gecamines announced that it was in talks to give CNMC a majority stake in Gecamines’s flagship Deziwa copper mine, part of a larger, five-project, \$2 billion deal.¹³² The agreement came as Gecamines struggled under debt, including a \$200 million loan it had taken out to acquire full rights to Deziwa in 2012 after an earlier joint venture failed.¹³³ Copper production at Deziwa had been intended to bring Gecamines to solvency, but slumping global commodity prices challenged the company’s aims to attract investment to, and draw capital from, the project.¹³⁴

Strategic Intent: Pricing Power and Market Control

Chinese strategic discourse provides a context for these patterns, suggesting that Beijing’s ambitions with respect to mineral resources on the African continent orient around long-term, comprehensive market control rather than short-term benefit or immediate domestic demand. A number of Chinese sources explain a competitive intention to shape international production and supply of mineral resources, including of resources that are critical industrial inputs. In a 2019 piece, Sinomine Resource Group researchers write that “the goal [of mining investment] in the

¹²⁸ David Erfle, “Chinese Gold Miners Continue Junior Shopping Spree,” *Kitco*, June 25, 2020. Cardinal Resources operates in Ghana but, as the deal has not been formalized at the time of writing, its footprint in Africa has not been factored into the tally of Chinese-invested mines for the purposes of this report.

¹²⁹ Tang Shihua, “Shandong Gold Ups Its Offer for Australia’s Cardinal Resources in Bidding War with Nord Gold,” *Yicai Global*, September 8, 2020.

¹³⁰ Reporting on the subject from *China Nonferrous Metal News* notes that “this quota is unique to the credit granted by large State-owned policy banks to enterprises in the African region, and fully reflects China’s support for enterprises in Africa.” (“CNMC Signed a \$3 billion Financial Product Service Agreement” (中国有色集团签署 30 亿美元金融产品服务协议), *China Nonferrous Metal News*, March 17, 2016. Translation).

¹³¹ “CNMC Signed a \$3 billion Financial Product Service Agreement” (中国有色集团签署 30 亿美元金融产品服务协议), *China Nonferrous Metal News*, March 17, 2016. Translation.

¹³² Thomas Wilson, “Congo Copper Miner Plans Chinese Joint Venture at Main Asset,” *Bloomberg*, June 15, 2016. Little information has been disclosed on the contours or contracts of this larger deal, an opacity that is reported to violate the DRC mining law which requires that contracts be published on the Ministry of Mines website. (“The Deal for Deziwa,” *Global Witness*, August 2020.) An initial strategic cooperation agreement between the two parties had first been announced in June 2015. (“Congo State Miner Signs MOU with Chinese Firm to Raise Copper Output,” *Reuters*, January 25, 2016.)

¹³³ “Mega Deal Between Gecamines and Chinese State-Owned Company CNMC for One of DRC’s Flagship Copper Mines Could Be Leaving the Country Short-Changed,” *Global Witness*, August 6, 2020. Reports suggest that Gecamines defaulted on that loan in 2015. (Ibid)

¹³⁴ “DRC’s Gecamines Plans Chinese Joint Venture at Main Asset,” *Bloomberg*, June 16, 2016.

mature stage is to control the market and guide the technology.” They claim success: “In order to alleviate the bottleneck constraints of incomplete resource development, China has implemented Go Out; Two Markets, Two Resources; and Belt and Road, and actively participated in the reconfiguration of the international market of mineral resources.”¹³⁵

A 2018 article in *China Nonferrous Metal News* on China’s global copper positioning points directly to pricing power: “As the world’s largest copper consumer market, China consumes about 50 percent of the world’s copper resources. Lack of market pricing power means ‘passive slaughter...In recent years, many Chinese enterprises have expanded into the global copper raw material market and mines, which has given China influence over the global copper market!”¹³⁶

The Sinomine researchers explain a development strategy premised on identifying gaps, filling them, and then building upstream and downstream presence on those footholds. “In any market, there will always be market gaps...So even if China’s mineral resources Go Out strategy began late, and the existing international market for mineral exploration is dominated by international mining giants, there are still many market gaps.”¹³⁷ Per the piece, Chinese companies should focus on these gaps. Upstream and lower value-added industrial chains offer the best chance of early success. Success in those areas then allows companies to “transition to competition in the downstream market of the industrial chain.” The piece cites mineral resources with “unclear prospects for exploration,” explaining that non-Chinese companies generally avoid these. “This creates opportunities for mineral exploration companies.” Having prospected in those areas, Chinese companies can use the relevant information “actively to participate in equity investment or strive for direct mineral product trade.”¹³⁸

Such discussions all prioritize economic profit. However, they prioritize profit derived from control over the mineral market rather than from engagement within an uncontrolled system. Yao Guimei outlined as much in a 2003 piece suggesting that the competition for international resources is fundamentally one over their market system design.

China is objectively in a vortex of fierce competition for international resources. In this case, if we do not consider China’s economic development of global resources, if we are only satisfied with the random purchase of mineral products on the international market, we will have to pay higher prices for imported mineral products on the international market. That price will be readily controlled by others. It is a better policy to go to African countries for exploration, to establish independent mining companies, and to gradually set up our

¹³⁵ Zhang Jinwei et al., “Exploration of Overseas Business Model of Geological Exploration Enterprises: Taking China Mining Resources as an Example” (地勘企业海外经营模式探索:以中矿资源为例), *China Mining*, 2019. Translation.

¹³⁶ “The Rise of Copper: We Account for Ten of the World’s Top Ten Copper Companies, and We Account for Two of the World’s 26 Super Copper Mines!” (铜的崛起: 全球十大铜企排名我们占仨, 全球 26 座超级铜矿我们占俩!), *China Nonferrous Metal News*, April 27, 2018. Translation.

¹³⁷ Zhang Jinwei et al., “Exploration of Overseas Business Model of Geological Exploration Enterprises: Taking China Mining Resources as an Example” (地勘企业海外经营模式探索:以中矿资源为例), *China Mining*, 2019. Translation.

¹³⁸ Zhang Jinwei et al., “Exploration of Overseas Business Model of Geological Exploration Enterprises: Taking China Mining Resources as an Example” (地勘企业海外经营模式探索:以中矿资源为例), *China Mining*, 2019. Translation.

own global mineral resources supply guarantee system. Only by actively governing the allocation of international resources and breaking the control of Western countries over the world's strategic resources can we ensure the sustained and stable development of China's social economy.¹³⁹

Yao places this perspective within the Two Markets, Two Resources context. “The development and use of African mineral resources is a major strategy to solve the safety and long-term stable supply of China's mineral resources under the guidance of the Central Government's principle of ‘using Two Resources and opening Two Markets.’ Those principles are an important part of implementing China's global resource strategy. Therefore, we must attach great importance to it and take the initiative to attack.”¹⁴⁰

A 2015 article by researchers at the Chinese Academy of Sciences and Chinese Academy of Geological Sciences updates Yao's Two Markets, Two Resources framing for emerging industrial demand. “For many years, the development and use of China's mineral resources has followed the strategy of fully utilizing ‘Two Markets, Two Resources.’ But with the long-term high-intensity mineral development and utilization in China [sparked by new industry], the ratio of mineral resources to reserves has gradually declined, China's dominant [domestic production] status in international minerals has been reduced...Therefore, it becomes an inevitable choice to protect domestic mineral resources and maximize the use of overseas resources.”¹⁴¹

The piece then outlines two key efforts. First, the defense of domestic resources, through both protection of designated, strategic minerals and export restriction on their products and primary raw materials. Second, influence over foreign resources: The “expansion of the ‘Go Out’ strategy from acquiring or occupying overseas mineral resources to shaping global resources.” The article describes a “mineral resources global strategy coordinated with the national global strategy” of industrial prioritization to “influence the world's resources.”¹⁴²

Africa is identified as a key source of mineral resources in this strategy: “Africa and the Middle East are very rich in resources. China can connect those to the human resources and market advantages of ASEAN countries and India and the industrial, capital, technological, and talent advantages of China.” The article outlines a range of mechanisms through which to position in Africa, namely “acquisition of mineral rights, investment, joint venture development, shareholding, and other methods of cooperation designed to obtain resources, transfer technology, occupy the market, and enhance regional influence.” All are to be coordinated by a State Council-led consortium of ministries and policy banks.¹⁴³

¹³⁹ Yao Guimei, “Strategic Consideration on Exploitation and Utilization of African Mineral Resources” (关于开发利用非洲矿产资源的战略思考), *West Asia and Africa*, 2003. Translation.

¹⁴⁰ Yao Guimei, “Strategic Consideration on Exploitation and Utilization of African Mineral Resources” (关于开发利用非洲矿产资源的战略思考), *West Asia and Africa*, 2003. Translation.

¹⁴¹ Yu Wenji et al., “New Global Patterns and New Chinese Resource Strategies” (世界新格局与中国新矿产资源战略观), *Resource Science*, 2015. Translation.

¹⁴² Yu Wenji et al., “New Global Patterns and New Chinese Resource Strategies” (世界新格局与中国新矿产资源战略观), *Resource Science*, 2015. Translation.

¹⁴³ Yu Wenji et al., “New Global Patterns and New Chinese Resource Strategies” (世界新格局与中国新矿产资源战略观), *Resource Science*, 2015. Translation.

Case Study: South Africa

South Africa illustrates the extent of China's industrial chain integration. China invests at every step of the mineral industrial chain in South Africa, from mining to processing to industrial production – and even to an information technology-enabled trade logistics platform. South Africa is China's top African source of mineral imports as well as the site of the greatest number of Chinese-invested mines. Almost 90 percent of China's imports from South Africa are from extractive industries and various metals. China increasingly dominates South Africa's minerals trade: In 2018, 68.74 percent of South Africa's mineral resources went to China.¹⁴⁴

China's main mineral imports from South Africa are gold, copper, and platinum. China's mine investments suggest a similar orientation: gold is produced at 15 of South Africa's 26 China-invested mines, palladium and platinum at 13.¹⁴⁵ South Africa dominates the global platinum market. Its reserves account for more than 90 percent of the world's known totals.¹⁴⁶ 60 percent of Beijing's platinum comes from South Africa.¹⁴⁷

Wesizwe Platinum Limited acquired South Africa's Bakubung platinum, palladium, and gold mine in 2011 thanks to financing from the Jinchuan Group and the CAD Fund, themselves supported by the China Development Bank.¹⁴⁸ Chinese companies also invest indirectly in South Africa's mines, through stakes in foreign companies. In 2015, China's Zijin Mining Group bought a 60 percent stake in Australia's NKWE Platinum, owner of South Africa's Bushveld Complex.¹⁴⁹ Twenty of the 26 South African mines with Chinese investment are owned, in part or in full, by Sibanye-Stillwater. Headquartered in South Africa, Sibanye-Stillwater is the world's largest primary platinum producer, second largest primary palladium producer, and third largest gold producer.¹⁵⁰ Sibanye-Stillwater's largest shareholder, with a 16.81 percent stake, is Gold One International.¹⁵¹ Also headquartered in South Africa, Gold One International is itself owned by a consortium of Chinese companies, led by State-owned Baiyin Nonferrous Group.¹⁵²

¹⁴⁴ "South Africa Minerals Exports by Country 2018," World Integrated Trade Solution (WITS), The World Bank.

¹⁴⁵ As elsewhere in this report, Chinese mine investment totals have been aggregated through scrutiny of Chinese, English, and French language press coverage of African mine investments with external validation sourced from investment and operator company press releases, financial disclosures, including SEC 13D and 13G filings accessible at the Security and Exchange Commission's EDGAR Search Database, and registrations maintained in Chinese business data services, including annual reports filed with the China Securities Regulatory Commission.

¹⁴⁶ "Global Platinum Mining to 2022," *Research and Markets*, 2019.

¹⁴⁷ UN Comtrade: International Trade Statistics Database. United Nations.

¹⁴⁸ Richard Lapper, "China Seals African Platinum Deal," *Financial Times*, May 25, 2010.

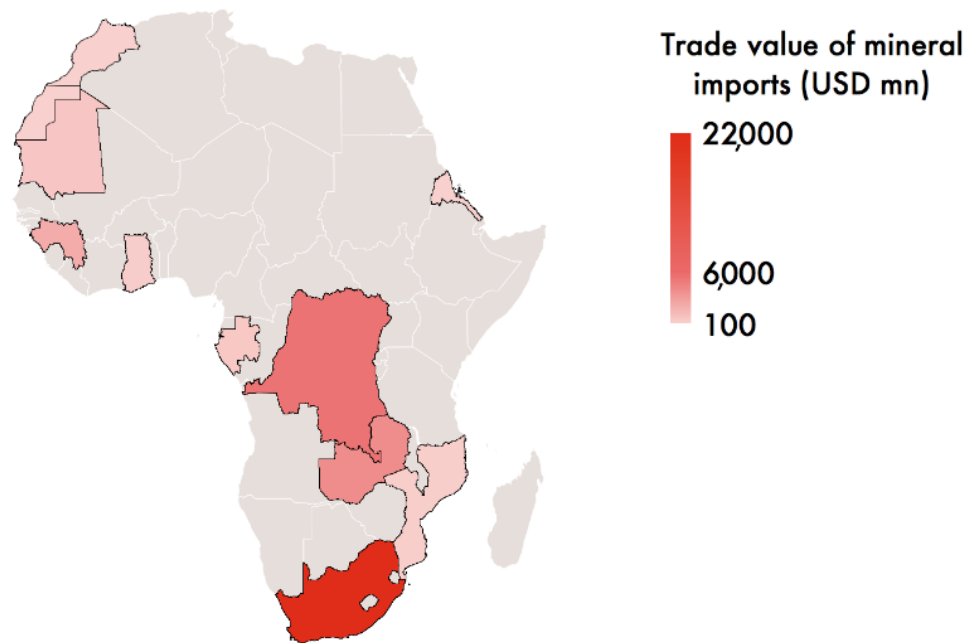
¹⁴⁹ Barry Sautman and Yan Hairong. "Chinese Mining in Africa and its Global Controversy." In Saleem H. Ali, Kathryn Sturman, Nina Collins (Eds), *Africa's Mineral Fortune: The Science and Politics of Mining and Sustainable Development*, Routledge: 2018.

¹⁵⁰ "About Us: Sibanye-Stillwater," Sibanye-Stillwater, <https://www.sibanyestillwater.com/about-us/>.

¹⁵¹ "Shareholder Information," Sibanye-Stillwater, <https://www.sibanyestillwater.com/news-investors/>

¹⁵² Robb M. Stewart, "Gold One Accepts Takeover Offer," *Wall Street Journal*, May 17, 2011. Sibanye-Stillwater is the result of a 2016 merger between South Africa's Sibanye and U.S. Stillwater. Gold One held a 19.9 percent stake in pre-merger Sibanye. ("Sibanye Gold Limited Prospectus," April 17, 2017, sec.gov) Stillwater was at that time the only active platinum and palladium producer in the United States. (Frik Els, "Stillwater Mining Takeover Needs More Study," *Mining.com*, May 3, 2017.)

Figure 10: China's Top Mineral Sources in Africa, 2018¹⁵³



Chinese actors invest downstream along the mineral industry chain in South Africa as well. Musina-Makhado Special Economic and Trade Zone offers a prime example. Declared a key project of China-Africa cooperation at the 2018 FOCAC, the zone specializes in metallurgy.¹⁵⁴ It is operated by South Africa Energy Metallurgical Base, a subsidiary of China Shenzhen Haimao Resources Holdings Co., Ltd.¹⁵⁵ The zone's industrial plant includes a coal washing plant, a coking plant, an iron plant, a stainless steel plant, a ferro-manganese powder plant, a ferrochrome plant, and a limestone plant.¹⁵⁶ Farther downstream, China's FAW automobile group launched a CAD Fund-supported automobile factory in South Africa in 2014.¹⁵⁷

¹⁵³ "UN Comtrade: International Trade Statistics Database." United Nations.

¹⁵⁴ "Build the World's Most Competitive Energy Metallurgy Base" (打造全球最具竞争力能源冶金基地——宁一海校友接受《中国改革报》专访), *Sohu News*, May 16, 2019. Translation.) A consortium of Chinese companies has committed to invest more than \$10 billion in the zone. Those companies include South Africa Energy Metallurgical Base, China Electric Power Construction Group, Taiyuan Iron and Steel Group, China Metallurgical Science and Industry Group, and Tianjie Group. (Helena Wasserman, "The New Coal Power Station in Limpopo Will Only Be Used by the Chinese: Here's Why It's an 'Irrational' Project," *Business Insider*, September 11, 2018.)

¹⁵⁵ "Build the World's Most Competitive Energy Metallurgy Base" (打造全球最具竞争力能源冶金基地——宁一海校友接受《中国改革报》专访), *Sohu News*, May 16, 2019. Translation.

¹⁵⁶ "Chinese Company Approved to Operate Musina-Makhado Special Economic Zone" (中国公司获准运营 Musina-Makhado 经济特区), *Sohu News*, September 19, 2017. Translation. As the chairman of South Africa Energy Metallurgical Base puts it, "the Special Economic Zone will integrate the advantages of energy metallurgy, forming a one-stop energy metallurgical production process...South Africa mainly exports minerals and metals to China [and] South Africa has more than 83 percent of the world's chrome ore resources and more than 81 percent of the world's manganese ore resources." ("Build the World's Most Competitive Energy Metallurgy Base" (打造全球最具竞争力能源冶金基地——宁一海校友接受《中国改革报》专访), *Sohu News*, May 16, 2019. Translation.)

¹⁵⁷ "FAW Truck Assembly Plant Starts to Run in South Africa," *China Trucks*, July 15, 2014.

China invests in information-enabled trading systems to connect South Africa and China as well. In May 2019, CNMC's trading subsidiary, CNMC International Trading Co., launched its China-South Africa Logistics Platform. That platform leverages strategic cooperation agreements with State-owned COSCO Shipping as well as Taiping Shipping, CMA Ferry, and Wanbang Shipping. It provides integrated, information-enabled management for pre-port warehousing, packing, and port logistics.¹⁵⁸ Were this system to be connected to the already-integrated mining and processing systems organized by CNMC and its partners, it could provide comprehensive control of and information on an integrated industrial chain, from mining to shipping, between Africa and China.¹⁵⁹ Vertical integration promises obvious commercial advantages. It could also challenge global regulatory and oversight mechanisms that need independent verification of trade information for customs, environmental safety, and security concerns. For example, an integrated channel for mineral products from their point of extraction through their shipment overseas may remove transition points or engagement with other parties through which an outside regulatory body would otherwise be notified of risks or conduct its oversight.¹⁶⁰

¹⁵⁸ China International Trade Office, "China National International Trade Central and Southern Africa Logistics Platform Officially Launched Its Independent Full-Transport Business" (中色国贸中南部非洲物流平台自主全程联运业务正式启动), May 22, 2019, Translation.

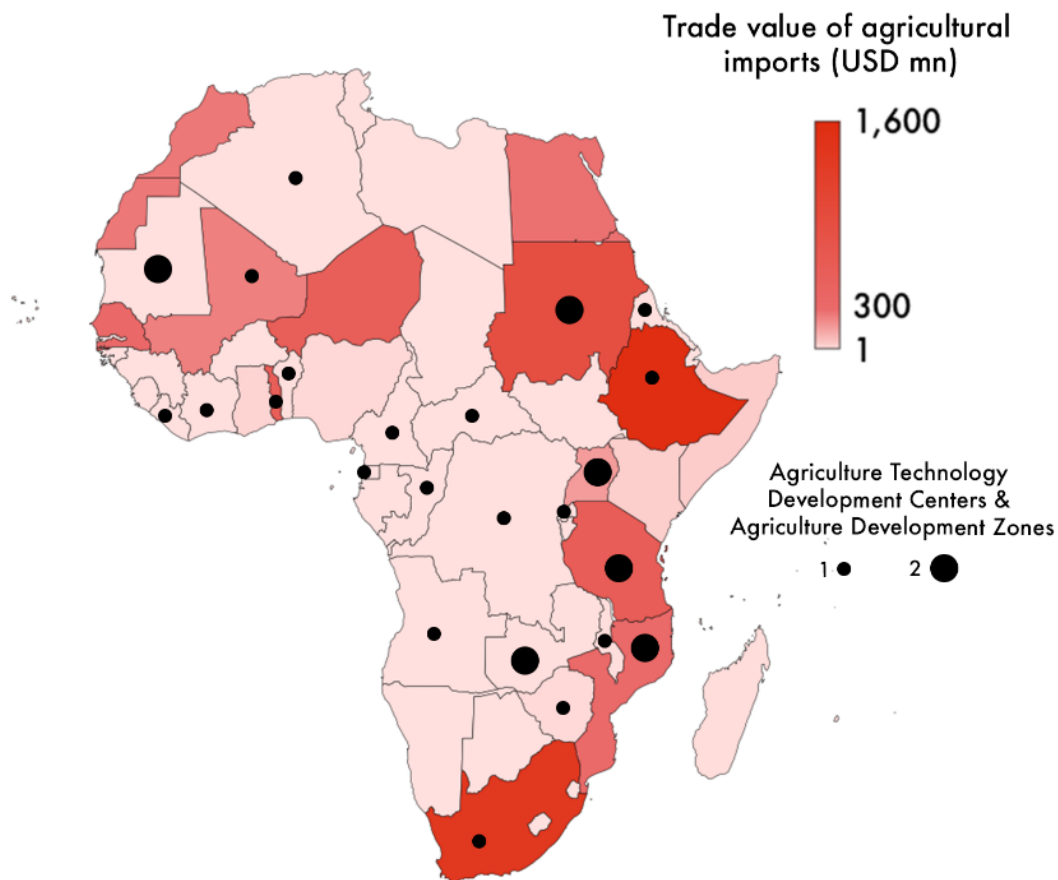
¹⁵⁹ The language with which the China-South Africa Logistics Platform is presented – and the affiliated partners – also mirrors that of China's larger National Transportation Logistics Platform (LOGINK). LOGINK is an international logistics system designed to connect road, sea, air, freight, energy, and postal information under a Ministry of Transport controlled information system. (LOGINK.cn) It is possible that the China-South Africa Logistics Platform is intended to link into that larger hub.

¹⁶⁰ In non-proliferation discourse, for example, these challenges are manifest in the need for financial controls and border controls that provide tactical means for oversight supplementing multinational export controls. See, for example, related discussions in Peter van Ham and Olivia Bosch, *Global Non-Proliferation and Counter-Terrorism: The Role of Resolution 1540 and Its Implications*, Brookings Institution Press, 2007.

Agriculture: Footholds in a Developing Market

As with minerals, agricultural investments can create foundations for industrial chain development. This chapter documents China's investment in Africa's agricultural resources, with an emphasis on Beijing's agriculture technology development centers and agriculture development zones, as well as Chinese discourse around Africa's agricultural markets and resources. China's agricultural engagement with African countries focuses on capturing markets for agricultural technology, products, and services. Agricultural technology and equipment constitute one of the ten priority areas of Beijing's Made in China 2025 industrial plan.¹⁶¹

Figure 11: China's Agriculture Trade with and Development Areas in Africa, 2014-2018¹⁶²



Agricultural resources, unlike many of the minerals extracted in Africa, are not resources whose supply is consolidated on the African continent: African countries do not provide nodes for controlling the global market. China's agricultural trade with Africa is dwarfed by its mineral and

¹⁶¹ State Council of the People's Republic of China, Made in China 2025 (国务院关于印发《中国制造2025》的通知), May 8, 2015. Translation.

¹⁶² UN Comtrade, International Trade Statistics Database. United Nations; China Council for the Promotion of International Trade; Ministry of Agriculture, "The First Batch of Overseas Agricultural Cooperation Demonstration Zones (首批境外农业合作示范区)", November 15, 2018. Translation; Foreign Economic Cooperation Center of the Ministry of Agriculture and Rural Affairs, "Overview of China-Africa Agricultural Cooperation" (中非农业合作概况), *Rural Work Communication*, 2018. Translation.

energy counterparts. The value of China's agricultural imports from Africa amounts to a small share of overall imports, totaling approximately \$2 billion in value per year. By contrast, China imported approximately \$50 billion worth of minerals from Africa in 2018.¹⁶³

Agriculture Technology Development Centers and Agriculture Development Zones

Beijing has institutionalized its connection to Africa's agricultural markets and development through a series of agricultural development areas. Beijing initiated a first set, called "Sino-African Agricultural Technology Demonstration Centers," at the 2006 FOCAC. Beijing originally committed to 10 such centers.¹⁶⁴ As of 2018, it had built 25.¹⁶⁵ The technology demonstration center program is jointly planned and organized by the Chinese Ministries of Commerce and Agriculture. The centers are built and operated by Chinese companies, research institutions, and government departments, backed by government funding.¹⁶⁶ The centers and their financing are intended to be handed over to their host, African country governments after three years.¹⁶⁷

The centers range in focus, some orienting around agricultural equipment, others the planting or breeding industry. The Ministries of Commerce and Agriculture explain a dual-pronged ambition: "promoting the increase in food production in the recipient countries, improving agricultural technology, and improving the level of food security; also building a platform for enterprises to develop in Africa, and promoting agriculture's Go Out."¹⁶⁸ A 2016 National Social Science Fund project elaborates on the latter point: "These centers assist enterprises in investing in African countries and establishing good relations with African governments; the demonstration centers can reduce the time between investment in Africa and profit."¹⁶⁹

¹⁶³ UN Comtrade: International Trade Statistics Database. United Nations.

¹⁶⁴ Gao Guixian, "The Functional Positioning of China-Africa Agricultural Technology Demonstration Center and Suggestions for Sustainable Development" (中非农业技术示范中心的功能定位及可持续发展的建议), *World Agriculture*. 2016. Translation.

¹⁶⁵ Zhang Chen and Qin Lu, "Path Analysis and Countermeasures for the Sustainable Development of My Country's Agricultural Aid Projects" (我国农业援助项目可持续发展的路径分析与对策建议), *International Economic Cooperation*, 2018. Translation.

¹⁶⁶ Operating companies span State-owned enterprises (e.g., China Agricultural Development Group, which operates both the Benin, Algeria, and South Africa centers), State-invested enterprises (e.g., ZTE Energy, which operates the DRC center), private companies (e.g., Guangxi Bagui Agricultural Technology Company, which operates the Ethiopia center), research institutes and universities (e.g., Jilin Agricultural University, which operates the Uganda and Zambia centers), and government branches (e.g., Hubei Provincial Agricultural Reclamation Administration, which operates the Mozambique Center. (Zhou Hang, "Problems in the Operation of China-Africa Agricultural Technology Demonstration Centers" (中国援非农业技术示范中心运转中的难题), *China Politics*, November 6, 2014. Translation)

¹⁶⁷ Chinese sources acknowledge the challenges to such a plan: "In Africa," writes a 2016 National Social Science Fund project, "most farmers do not have the ability to pay for service fees. After a three-year technical cooperation period, the operation of these demonstration centers will face great difficulties." (Gao Guixian, "The Functional Positioning of China-Africa Agricultural Technology Demonstration Center and Suggestions for Sustainable Development" (中非农业技术示范中心的功能定位及可持续发展的建议), *World Agriculture*. 2016. Translation.)

¹⁶⁸ Gao Guixian, "The Functional Positioning of China-Africa Agricultural Technology Demonstration Center and Suggestions for Sustainable Development" (中非农业技术示范中心的功能定位及可持续发展的建议), *World Agriculture*. 2016. Translation.

¹⁶⁹ Gao Guixian, "The Functional Positioning of China-Africa Agricultural Technology Demonstration Center and Suggestions for Sustainable Development" (中非农业技术示范中心的功能定位及可持续发展的建议), *World Agriculture*. 2016. Translation. There are also ten corresponding zones in China. The China-based zones are designed to ease the export and import of agricultural products and equipment. (Ibid.)

In 2017, the Ministry of Agriculture launched a parallel project: ten “international agriculture development zones.” They include five bases in Africa (Appendix C).¹⁷⁰ As it is new, the concrete implications of this project remain difficult to assess. Government policy does however make intentions clear. The Ministry of Agriculture’s 2017 announcement on the launch of the project presented a clear ambition to leverage foreign resources and integrate industry chains:

Enterprises in overseas agricultural cooperation demonstration zones should leverage regional resource advantages and industrial characteristics; optimize the demonstration zone planning and design, strengthen the construction of the entire industrial chain; promote the integration of first, second, and third industries...to create a platform for industry aggregation and integration and lead enterprises to Go Out together.¹⁷¹

The Ministry of Agriculture’s “Measures for the Appraisal and Assessment of Overseas Agricultural Demonstration Zones” describe the Zones as “platforms and carriers to drive agricultural enterprises to Go Out.” The measures clarify that the demonstration zones are designed to foster a “clustering effect” and Chinese presence along the agricultural industry chain.¹⁷² To that end, the Measures outline minimum quotas for Chinese-funded companies and investment in the zones.¹⁷³

Establishing Footholds in Africa’s Agriculture Markets

Agriculture development areas co-exist with a host of other Sino-African agricultural engagement measures, including bilateral cooperation agreements, the dispatch of agricultural technical experts, and personnel and equipment training.¹⁷⁴ Chinese public-facing discourse emphasizes the role of these projects in improving Africa’s food supply and security.¹⁷⁵ Internal Chinese discourse suggests an additional set of ambitions, focused on capitalizing on Africa’s markets for agricultural equipment and establishing production bases for the processed goods based on agricultural inputs (e.g., textiles).

A 2018 research project supported by the Chinese National Social Science Fund on agriculture zones in Africa explains the scope of China’s projected returns: “While integrating the agricultural

¹⁷⁰ Ministry of Agriculture, “The Ministry of Agriculture Recognizes the First Batch of Overseas Agricultural Cooperation Demonstration Areas” (农业部关于认定首批境外农业合作示范区), August 4, 2017. Translation. The zones in Africa emphasize agricultural machinery and crops, like cotton, that fuel light industry. Those agricultural zones that prioritize food revolve around cash crops like rice and corn. (Ibid)

¹⁷¹ Ministry of Agriculture, “The Ministry of Agriculture Recognizes the First Batch of Overseas Agricultural Cooperation Demonstration Areas” (农业部关于认定首批境外农业合作示范区), August 4, 2017. Translation.

¹⁷² “Measures for the Appraisal and Assessment of Overseas Agricultural Cooperation Demonstration Zones (境外农业合作示范区认定考核办法), November 25, 2017. Translation.

¹⁷³ “Measures for the Appraisal and Assessment of Overseas Agricultural Cooperation Demonstration Zones (境外农业合作示范区认定考核办法), November 25, 2017. Translation.

¹⁷⁴ “China Is Only Building 25 Agricultural Technology Demonstration Centers in Africa” (我国仅在非洲援建 25 个农业技术示范中心), *Farmer’s Daily*, October 23, 2016. Translation.

¹⁷⁵ Zhang Chequn et al., “Path Analysis and Countermeasures of Sustainable Development of Agricultural Aid Projects in China” (我国农业援助项目可持续发展的路径分析与对策建议), *International Cooperation*, 2018. Translation.

development needs of the recipient countries, agricultural assistance to Africa should serve China's own economic development needs. When selecting key technology demonstration and development areas, China's agricultural products, materials, machinery, and other Go Out elements should seek to maximize their advantages, demand, and good investment opportunities."¹⁷⁶

Yang Baorong of the Chinese Academy of Social Sciences writes more broadly of China's agricultural interests in Africa. He focuses on the agricultural market share to be claimed by integrating into Africa's agricultural development: "Any forward-thinking multinational agricultural corporation must pay attention to Africa. Investment in the continent will strengthen that corporation's position in the global food and agricultural chain."¹⁷⁷ Yang explains that Chinese agricultural companies investing in Africa focus on the cultivation industry, namely of biofuels and cash crops, as well as "investment in agricultural upstream and downstream industries," namely food processing and machinery.¹⁷⁸

China's industry groups echo the line. In June 2016, the Chinese National Agricultural Machinery Circulation Working Conference held a meeting dedicated to "entering the blue ocean in Africa." As the founder and secretary general of the China Overseas Agricultural Industry Alliance put it in his keystone, "whoever enters Africa first will lead the global agricultural machinery industry." So, China should "transfer its agricultural machinery production capacity to Africa, contribute to African agriculture, and realize the mutual benefit provided by the window of opportunity." He calculates that the "potential market for agricultural machinery in Africa will reach \$300 billion!"¹⁷⁹

That market is also of interest to U.S. players, a potential tension that is not ignored in Chinese analyses. A 2018 article by the China-Africa Trade Research Center¹⁸⁰ reports that "driven by the expansion of key markets such as Ethiopia and Zimbabwe, John Deere of the United States expects Africa's demand for its agricultural equipment will increase by eight to ten percent annually over the next few years."¹⁸¹ A 2018 article in the National Development and Reform Commission's *China Investment* journal paints a competitive dynamic: "The international competition between

¹⁷⁶ Zhang Chequn et al., "Path Analysis and Countermeasures of Sustainable Development of Agricultural Aid Projects in China" (我国农业援助项目可持续发展的路径分析与对策建议), *International Cooperation*, 2018. Translation.

¹⁷⁷ Yang Baorong, "Trends and Revelations of Agricultural Transnational Companies' Investment in Africa" (涉农跨国公司在非投资特点及启示), *West Asia and Africa*, 2015. Translation.

¹⁷⁸ Yang Baorong, "Trends and Revelations of Agricultural Transnational Companies' Investment in Africa" (涉农跨国公司在非投资特点及启示), *West Asia and Africa*, 2015. Translation. Yang also notes that privatization reforms in Africa have created ripe conditions for China. "After years of liberalization, Africa's agricultural investment is increasingly open to the outside world. They encourage investors to invest in agricultural upstream and downstream industries, provide State-owned land for investment enterprises through market means, and offer tax and other incentives for large investment projects." (Ibid)

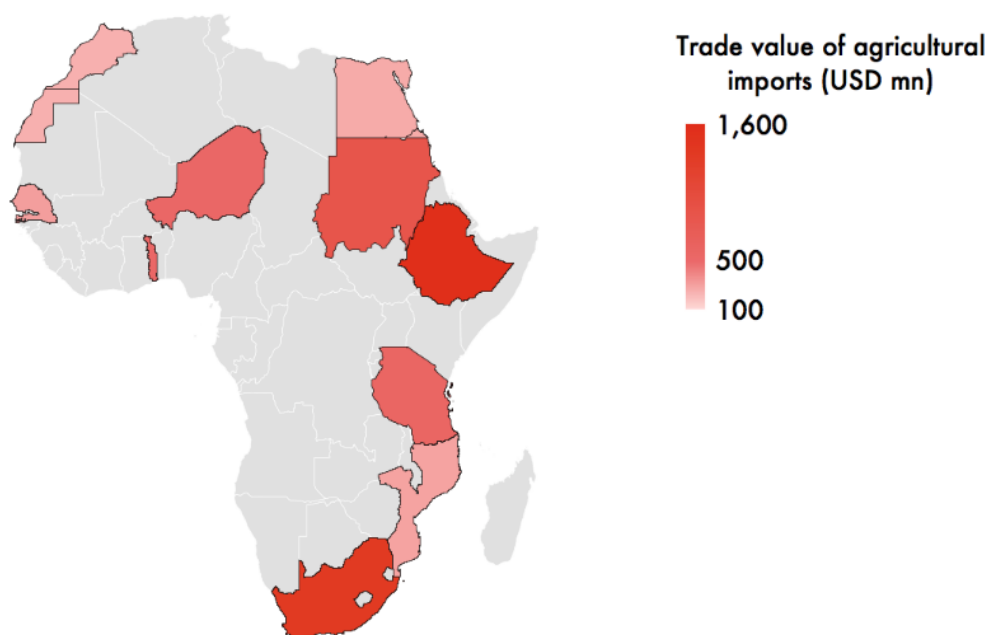
¹⁷⁹ Zhu Jing, "The Potential Market of African Agricultural Machinery Reaches \$300 billion" (非洲农机潜在市场达到 3000 亿美元), *Modern Agricultural Machinery*, 2016. Translation.

¹⁸⁰ Part of Afrindex, a Chinese e-commerce platform focused on Sino-African trade.

¹⁸¹ China-Africa Trade Research Center, "Global Agricultural Machinery Manufacturers Are Optimistic about the African Agricultural Machinery Market (全球农机制造商看好非洲农机市场), *Sohu News*, November 22, 2018. Translation.

Chinese manufacturing and European and American agricultural machinery brands is becoming more and more fierce. Global leading well-known companies such as John Deere, Sigma, Fiat, and AGCO have also begun to increase their investment in the African market,” reads the piece, before then laying out a “competitive strategy” for Chinese agricultural machinery companies.¹⁸²

Figure 12: Top Ten Sources of China’s Agricultural Imports from Africa, 2018¹⁸³



Industrial Capacity Cooperation

As is evident in both the mineral and the agriculture cases, industrial cooperation parks play important roles in China’s engagement in Africa (Appendix D).¹⁸⁴ This chapter documents the nature and scope of China’s industrial zones in Africa and explores their role in fostering concentrated industrial clusters and complete industry chains leveraging targeted foreign advantageous resources – including mineral resources, agriculture, and inexpensive labor.¹⁸⁵ The

¹⁸² Chen Jin and Wang Zhan, Strategies to Capture Africa (抢滩非洲策略), *China Investment*, December 20, 2018. Translation. The article also notes that the China’s Foton Lovol has “identified the African market as a strategic market” and that Chery has launched a “Going into Africa” strategy and intends to invest \$260 million in developing agricultural machinery production operation centers in seven countries in Africa.

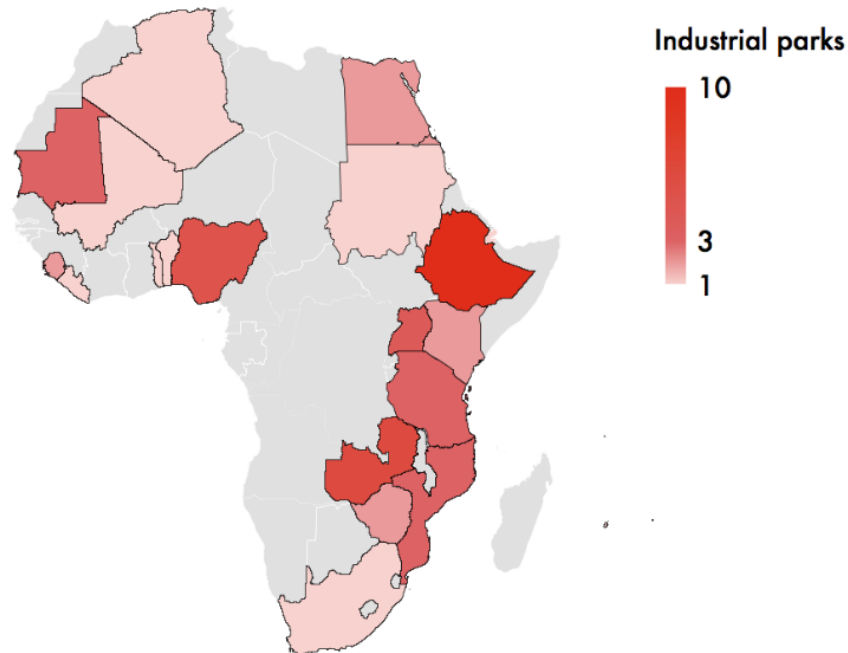
¹⁸³ “UN Comtrade International Trade Statistics Database.” United Nations.

¹⁸⁴ “Industrial parks,” writes Wu Mingquan of the Chinese Academy of Sciences, “are an important platform for Chinese enterprises to Go Out.” (Wu Mingquan et al., Information Dataset of China’s Overseas Industrial Parks (中国境外产业园区信息数据集), *Science Data Bank*, 2019. Translation.)

¹⁸⁵ Liu Xinwei, “Infrastructure is Still the Bottleneck for Africa’s Development” (基础设施仍是非洲发展瓶颈 共建海外园区是出路), *China Foreign Trade*, 2017. Translation. In African countries, Chinese projects generally rely on a mix of domestic labor and Chinese workers. For example, China’s Ministry of Agriculture requires that in overseas agricultural cooperation demonstration zones “the long-term employment of local personnel [be] not less than 30 percent of the total number of employees.” (Ministry of Agriculture, Measures for the Appraisal and Assessment of Overseas Agricultural Cooperation Demonstration Zones-Ministry of Agriculture (境外农业合作示范区认定考核办法-农业部), November 25, 2017. Translation.) For more in Chinese workers in Africa, see Appendix B.3.

chapter also surveys the value of industrial parks in directing Chinese commercial engagement in Africa and in facilitating access to developed markets.

*Figure 13: China's Industrial Parks in Africa*¹⁸⁶



Industrial cooperation parks are implemented and operated by Chinese State-owned and private companies and coordinated with host governments. Financing for the parks is often provided through institutions and programs like the Asian Investment Bank and Silk Road Economic Belt, as well as through policy banks.¹⁸⁷ The China Council for the Promotion of International Trade (CCPIT) organizes its investment guides for Chinese companies around the parks.¹⁸⁸

Since 1993, China has established at least 45 industrial parks over sixteen countries in Africa (Appendix D).¹⁸⁹ Ethiopia boasts the most with ten, all but one built since 2015. Nineteen of

¹⁸⁶ Data on industrial parks is aggregated from China's Ministry of Commerce website, the website of the China Center for the Promotion of International Trade, and Wu Mingquan et al., Information Dataset of China's Overseas Industrial Parks (中国境外产业园区信息数据集), *Science Data Bank*, 2019. Translation.

¹⁸⁷ Wu Mingquan et al., Information Dataset of China's Overseas Industrial Parks (中国境外产业园区信息数据集), *Science Data Bank*, 2019. Translation.

¹⁸⁸ "The CCPIT Research Institute has recently issued an investment guide for overseas economic and trade cooperation parks," reads a 2018 announcement, "which provides references for Chinese enterprises to use the cooperation parks to invest overseas, and helps enterprise Go Out." ("The CCPIT Issued an Investment Guide to Help Enterprises Go Out with Overseas Economic and Trade Cooperation Zones" (贸促会发布投资指南 助力企业借力境外经贸合作区走出去), December 4, 2018. Translation.)

¹⁸⁹ Data on industrial parks is aggregated from China's Ministry of Commerce website, the website of the China Center for the Promotion of International Trade, and Wu Mingquan et al., Information Dataset of China's Overseas Industrial Parks (中国境外产业园区信息数据集), *Science Data Bank*, 2019. Translation.

China's industrial parks in Africa are operated by private companies, 26 by SOEs.¹⁹⁰ At least four of the zones – the Egypt Suez Economic and Trade Cooperation Zone, Ethiopia Eastern Industrial Park, Mozambique-China Agricultural Technology Center,¹⁹¹ and South Africa Hisense Cape Town Atlantis Industrial Park – are invested in by the CAD Fund.¹⁹² Five of China's industrial parks in Africa focus on heavy industry, thirteen on light industry, and thirteen on agriculture. The final fourteen are categorized as comprehensive industry zones.¹⁹³

The industrial zones are predominately populated by Chinese companies. Members enjoy preferential taxation and regulatory treatment from the local governments.¹⁹⁴ The industrial zones also provide their members with information consulting services (e.g., legal support), operation management services (e.g., customs and human resources support), property management services (e.g., maintenance, housing, and construction support), and emergency services. The zones connect companies to transportation, logistics, and material resources.¹⁹⁵ Gu Dawei of the National Development and Reform Commission (NDRC) explains that “the NDRC and relevant Chinese ministries guide and support Chinese enterprises, relying on important ports and railways to accelerate cooperation in African free trade zones, special economic zones, and industrial zones.”¹⁹⁶ He points to China Communications Corporation and China Earth Corporation's cooperation in jointly developing an industrial park project along Ethiopia's Yaji Railway – itself also funded by China.

Chinese discourse outlines three chief purposes of the zones. The first is industrial capacity cooperation that leverages access to Africa's strategic resource and labor inputs. The second is the construction of integrated industrial clusters. The third is market access, in Africa and globally. “Overseas park construction is a new opportunity that can effectively solve China's overcapacity and find new growth points for China's economy,” explained Shang Shenping deputy director of

¹⁹⁰State-owned China Civil Engineering Co. is the only company to have more than two parks, with four, all in Ethiopia. CNMC and Qingdao Ruicheng Cotton Industrial Co. each have one project divided into two parks.

¹⁹¹ Which is also classified as one of the Sino-African agricultural technology development centers.

¹⁹² Capacity Cooperation, “China-Africa Development Fund.” <http://en.cadfund.com/Column/61/0.htm>

¹⁹³ The scope of light industry ranges include textile-focused parks (e.g., the China Egypt Mankai Textile Industrial Park, Yuemei Nigeria Textile Industrial Park) as well as energy-focused ones: The Hisense Cape Town Industrial Park, spearheaded by Hisense and invested in by the CAD Fund, orients around green technology products such as solar photovoltaic modules, solar water heaters, wind turbine parts, and smart meters. The agricultural industry parks span the agricultural industry chain, from production and harvesting (e.g., the China-Mauritania Marine Economic Cooperation Park) to processing (e.g. the Zambia Agricultural Products Processing Cooperation Park), with focuses including leather goods, rubber, marine agriculture, and cotton. With the exception of the Mozambique-China Agricultural Technology Demonstration Center, these are distinct from the Ministry of Agriculture's Sino-African cooperative parks. The five heavy industry parks cover automobile production, power, mining, and building materials. Comprehensive parks have broad mandates: The Egyptian Suez Economic and Trade Cooperation Zone, for example, encompasses the textile and apparel industries, petroleum equipment, high and low voltage electrical appliances, new materials, and chemicals. Nigeria's Lekki Free Trade Zone hosts manufacturing, product assembly, logistics, urban services, and real estate.

¹⁹⁴ Wu Mingquan et al., Information Dataset of China's Overseas Industrial Parks (中国境外产业园区信息数据集), *Science Data Bank*, 2019. Translation.

¹⁹⁵ China Council for the Promotion of International Trade, Overseas Industrial Park Information Service Platform (境外产业园区信息服务平台).

¹⁹⁶ Gu Dawei, “China-Africa Three Networks, One Standardization and Production Capacity Cooperation Help Africa's Industrialization Process,” (中非“三网一化”与产能合作助力非洲工业化进程) *China Investment*, 2016. Translation.

the Strategy and Consulting Department of the China International Contractors Association in 2017.¹⁹⁷ He further notes that the goal of the parks is to “match and optimize” capital and labor resources, and that “overseas parks create favorable conditions for enterprises to Go Out and reduce operating costs.”¹⁹⁸

Pu Yingji of the Chinese Academy of Social Sciences explains that China also uses industrial zones to foster complete industrial clusters in Africa: “the Chinese government strongly supports powerful enterprises to establish economic and trade cooperation zones overseas, to drive more Chinese enterprises to invest in foreign countries and form a cluster effect.”¹⁹⁹ Or, per the CCPIT, these “are platforms for Chinese enterprises to ‘Go Out in groups.’”²⁰⁰

Wei Xiaohui of the Guangdong University of Foreign Studies spells out the relationship between China’s industrial parks and integrated industrial chains: “China’s overseas economic and trade cooperation zones usually revolve around the park’s leading products, introducing interconnected industries or upstream and downstream enterprises in the same industrial chain to form a cluster of investment. The aggregation of enterprises producing the same product forms a benefit-sharing and cost-sharing effect in information, facilities, and markets.”²⁰¹

Integrated industrial platforms allow Chinese companies to capitalize on Africa’s industrial opportunities; to leverage available resources and the low cost of industry that comes with early stage economic development – even as prices rise in China. The platforms also allow Beijing influence over the process. In shaping the mandate of industrial parks, Beijing is able to shape the industries that Chinese companies pursue in Africa. This is the “State-led, Enterprise-driven” model at work. And in connecting industrial parks to resource investments (e.g., the ZCCZ, which links to CNMC’s Chambishi mine and processing plant) and transportation channels, China builds integrated supply chains, with the value from each node transferred to the next.

¹⁹⁷ Liu Xinwei, “Infrastructure Is Still the Bottleneck for Africa’s Development” (基础设施仍是非洲发展瓶颈 共建海外园区是出路), *China Foreign Trade*, 2017. Translation.

¹⁹⁸ Liu Xinwei, “Infrastructure Is Still the Bottleneck for Africa’s Development” (基础设施仍是非洲发展瓶颈 共建海外园区是出路), *China Foreign Trade*, 2017. Translation. As Shang’s “capital and labor” framing suggests, industrial zones leverage not just Africa’s resources, but also its low costs of labor. Pu Yingji of the Chinese Academy of Social Sciences spells out a prioritization of Go Out destinations in Africa based on technological capacity, resource reserves, and cost of labor in the destination country. (Pu Yingji, “Country, Path and Strategic Choice of Chinese Direct Investment in Africa” (中国对非洲直接投资的国别、路径及策略选择). *West Asia and Africa*, 2009. Translation.)

¹⁹⁹ Pu Yingji, “Country, Path and Strategic Choice of Chinese Direct Investment in Africa” (中国对非洲直接投资的国别、路径及策略选择). *West Asia and Africa*, 2009. Translation. Yao Guimei summarizes, explaining that infrastructure and industrial park construction serve as the orienting axis for “China-Africa industrial capacity cooperation.” Such capacity cooperation “centers on the construction, transfer, and upgrading of production capacity, with the enterprise as the main body; the market as the aim; manufacturing, connected infrastructure, and energy resource development as the main fields; and direct investment, engineering contracting, equipment trading, and technical cooperation as the main forms. (Yao Guimei, “China-Africa Capacity Cooperation: Effectiveness, Problems and Prospects” (中非产能合作:成效、问题与前景), *International Economic Cooperation*, 2017. Translation.)

²⁰⁰ “The CCPIT Issued an Investment Guide to Help enterprises Go Out with Overseas Economic and Trade Cooperation Zones” (贸促会发布投资指南 助力企业借力境外经贸合作区走出去), December 4, 2018. Translation.

²⁰¹ Wei Xiaohui, “The Big Platform for SMEs to Go Out” (中小企业“走出去”的大平台), *Chinese SMEs*, 2019. Translation.

Industry zones also ease market access. Goods produced and processed in most zones can be directly sold on their host country's market, as well as traded without import and export licenses.²⁰² Production at Africa-based industrial zones can also grant Chinese firms preferential treatment in the global market. Descriptions of Nigeria's Lekki Free Trade Zone note that "due to the African Growth and Opportunity Act, companies are not subject to quota restrictions on exports to the EU and the United States. Nigeria is also a member country of the Lome Agreement. Enterprises enjoy preferential tariffs on exports to the EU market."²⁰³ As early as 2007, a year after the Zone was founded, a *Xinhua News* article wrote that, "The advantages of the Lekki Free Trade Zone as a development zone outside China have emerged...Nigeria is a member of the Lomé agreement, and its products can enjoy preferential tariffs in the EU market without quota restrictions. Setting up factories in the free trade zone to realize the localization of the origin will help avoid various trade barriers and ease international trade frictions."²⁰⁴ As of April 2019, 44 Chinese companies, including Huawei and Sinotruk, had formally signed investment agreements in the Lekki Zone.²⁰⁵

Case Study: Ethiopia

Ethiopia offers a prime case study of China's industrial zone apparatus, the industrial integration that China builds both in and around its parks, and implications for the African continent's development as well as global markets. "The most vigorous example of the development of the industrial park model in Africa is Ethiopia," announced China's *Sohu News* in 2019.²⁰⁶ Ten of China's 45 industrial parks in Africa are in Ethiopia.²⁰⁷

Ethiopia, home of the African Union's headquarters, has long been one of China's strongest partners in Africa. The two countries established diplomatic relations in 1970. In 2003, they signed a comprehensive cooperative partnership, launching China-Ethiopia relations into what Beijing calls a "fast track."²⁰⁸ That fast track is evident in infrastructure (e.g., the Yaji Railway and Addis Ababa City Light Rail). It is evident in cultural exchange, trade, and investment figures. It is also evident in industrial parks.²⁰⁹

²⁰² China Council for the Promotion of International Trade, Overseas Industrial Park Information Service Platform (境外产业园区信息服务平台).

²⁰³ Ministry of Commerce, "Nigerian Lekki Free Trade Zone" (尼日利亚莱基自由贸易区). Translation.

²⁰⁴ "China Nigeria Lekki Free Trade Zone Set Sail" (中国尼日利亚莱基自由贸易区起航), *Xinhua News*, December 16, 2007. Translation.

²⁰⁵ "Nigeria's Lekki Free Trade Zone Begins To Take Shape, Hundreds of Chinese and Foreign Companies Including Huawei Enter the Park" (尼日利亚莱基自贸区初具规模 华为等上百家中外企业入园). *Sina Finance*, April 29, 2019. Translation.

²⁰⁶ "Detailed Explanation of the Six Largest Chinese Industrial Parks in Ethiopia" (埃塞俄比亚溜达中国工业园详解), *Sohu News*, January 1, 2019. Translation.

²⁰⁷ Zambia, the site of the next most industrial parks, is home to six. The Commerce Department action against Changji Esquel Textile Co. Ltd., a Chinese textile manufacturer, for connection to forced labor involving Uyghurs and other Muslim minority groups in the Xinjiang Uyghur Autonomous Region could increase the utility of overseas textile production bases, like those in Ethiopia. (Commerce Department, "Commerce Department Adds Eleven Chinese Entities Implicated in Human Rights Abuses in Xinjiang to the Entity List, July" 20, 2020.)

²⁰⁸ Mo Xiaoqian, "Demonstration Role of Strengthening China-Ethiopia Cooperation" (加强中埃合作的示范作用), *One Belt One Road Report*, 2019. Translation.

²⁰⁹ Researchers from China's State-owned State Grid Energy Research Institute Co., Ltd. and China Power Technology Equipment Co., Ltd. offer a useful summary: "Chinese companies built and operated the first light rail and large industrial park in Ethiopia, built the first standardized railway, and participated in the construction of hydropower projects in Ethiopia. In terms of trade, China is Ethiopia's largest trading partner... In terms of financing,

The Eastern Industrial Park in Ducham Town is the flagship example. Launched in 2008 by China's Jiangsu Yongyuan Investment Co., Ltd, the Eastern Industrial was the first industrial zone in Ethiopia to be built and operated by foreign capital.²¹⁰ It focuses on agricultural products processing, metallurgy, building materials, and electromechanics. When Beijing launched the Belt and Road Initiative (BRI) in 2013, China's BRI enterprises flocked to Ethiopia and the Eastern Industrial Park. Responding to the new demand, China's Huajian Enterprise Group invested in an additional industrial zone in Ethiopia, Huajian Ethiopia Light City, with a narrower, but parallel, scope: leather, fur, feathers, and footwear.²¹¹

As the Eastern Industrial Park and Huajian Ethiopia Light City took off, Addis Ababa resolved to adopt the model for its own development efforts, hiring the China Development Zone Association to prepare an industrial zone plan.²¹² The result was eight additional industrial parks, built and led by Chinese companies, with Chinese equipment and infrastructure.²¹³

Chinese companies move to Ethiopia and to the parks drawn in part by preferential policies and regulatory environments, as well as by low labor and resource costs. They also move for market access. As Tao Huixing, director of the Eastern Industrial Zone managing committee, put it in a 2018 *China Daily* interview, "We have encountered many trade restrictions limiting exports to Europe and America, especially textiles, garments, televisions, and some tech products. In these circumstances, the Chinese government said, 'if you all stay in China, then it will be more difficult. Labor costs have increased, so you should find a new place overseas.'"²¹⁴

China's Industrial Textile Association echoes the point in its industry magazine, explaining that Ethiopia's low labor and energy costs, as well as abundant cotton resources, position it to meet the

in 2015 the Industrial and Commercial Bank of China and Ethiopia signed a Development Cooperation Agreement. In 2017, the China EXIM Bank and Ethiopia signed the Ethiopia-Hunan Industrial Park Project Loan Agreement. Ethiopia also officially joined the AIIB In March 2017... The number of Chinese flights to Ethiopia is increasing. Chinese have become the largest foreigner group in Ethiopia, and the number of Ethiopian students studying in China has gradually increased." (Zhai Huixia et al, "Reflections on the Image Building of Chinese Enterprises in Africa under the Background of the Belt and Road" (一带一路背景下中国企业在非洲形象建设思考), *External Communication*, 2018. Translation)

²¹⁰ Yao Guimei and Xu Man, "China-Africa Cooperation and the Strategic Connection of the Belt and Road Construction: Status and Prospects" (中非合作与一带一路建设战略对接:现状与前景), *International Economic Cooperation*, 2019, Translation.

²¹¹ Zhao Lei, "Fight for the Next Global Manufacturing Center: Ethiopia" (争当下一个全球制造业中心:埃塞俄比亚调研报告), *Belt and Road Report*, March 2019. Translation.

²¹² Zhao Lei. "Fight for the Next Global Manufacturing Center: Ethiopia" (争当下一个全球制造业中心:埃塞俄比亚调研报告), *Belt and Road Report*, March 2019. Translation.

²¹³ Istvan Tarrosy et al., "China and Ethiopia, Part 4: Mekelle Park," *The Diplomat*, April 16, 2020; Wang Xingping and Zhao Shengbo, "Urbanization in Africa: the Power of Industrial Parks" (非洲城市化:工业园的力量), *China Investment*, 2019. Translation.

²¹⁴ Tao projects that the appeal will be enduring and systemic: "A lot of China's low-wage industry will move here. In China, wages used to be very low, but now they are quite high. For some labor-intensive industries, it is very difficult to survive because of the increased labor cost. Here, wages are much, much lower – less than ten percent of Chinese wages." (David Blair and Xiao Xiangyi, "Manufacturers Look to Switch production to Africa," *China Daily*, October 15, 2018.)

global demand for textiles brought about by a “fast fashion” era.²¹⁵ The magazine also notes Ethiopia’s advantageous trade environment: “Many countries in the world give Ethiopian export products different degrees of preferential treatment...Ethiopia enjoys the duty-free and quota-free policies awarded to African products such as the African Growth and Opportunity Act and the EU’s “Everything But Arms Agreement,” which leads to conveniences in exporting to neighboring countries as well as the U.S. and Europe. In addition, most of Ethiopia’s commodities exported to China, Japan, Canada, Turkey, Australia, and New Zealand are not subject to tariffs and quota restrictions, and they enjoy preferential market access to India.”²¹⁶

Beijing connects its industrial parks in Ethiopia to transportation systems in which it invests. The China Communications Industrial Park is built along the Yaji Railway, itself also funded by China.²¹⁷ Beijing has integrated Ethiopia into a virtual commercial infrastructure as well. In December 2019, Ethiopia joined China’s Electronic World Trade Platform (eWTP), a cross-border e-commerce network founded by Alibaba and championed by the State Council.²¹⁸ EWTP provides smart logistics services and a digital architecture for cross-border trade.²¹⁹ The platform, of which Rwanda is also a member, aims to connect the countries’ markets and products to China’s. It also integrates logistics, e-commerce, and financial technology.²²⁰ EWTP may provide a foundation for Beijing to extend integrated control beyond the physical, local foundations of Ethiopia’s – and Africa’s – industry to its digital architectures and, with them, global market engagement.

The case of the Huajian Shoe company in Ethiopia suggests that the benefits for Chinese companies may come at the expense of Ethiopian players. Huajian is the sponsor of Huajian Ethiopia Light Industry City. It is China’s largest private enterprise in Ethiopia and the source of 65 percent of Ethiopia’s footwear exports. “As a labor-intensive enterprise,” writes Zhao Lei of the Chinese Communist Party School’s Belt and Road Institute. “Huajian has benefited from Ethiopia’s low labor costs, which consolidated its international competitiveness.”²²¹ Ethiopia’s resources and low costs make it a prime environment to produce shoes. But a Chinese company rather than an Ethiopian one dominates the industry.

²¹⁵ China Industrial Textile Industry Association, “Entering European and American Markets, Ethiopia Is a Springboard” (进军欧美市场, 埃塞俄比亚是跳板), *Textile Weekly*, 2017. Translation.

²¹⁶ China Industrial Textile Industry Association, “Entering European and American Markets, Ethiopia Is a Springboard” (进军欧美市场, 埃塞俄比亚是跳板), *Textile Weekly*, 2017. Translation.)

²¹⁷ Zhao Lei, “Fight for the Next Global Manufacturing Center: Ethiopia” (争当下一个全球制造业中心: 埃塞俄比亚调研报告), *Belt and Road Report*, March 2019. Translation. In 2016, forty-seven percent of Ethiopia’s road projects were undertaken by Chinese companies. (Gu Dawei, “China-Africa Three Networks, One Standardization and Production Capacity Cooperation Help Africa's Industrialization Process” (中非“三网一化”与产能合作助力非洲工业化进程), *China Investment*, 2016. Translation.)

²¹⁸ “Use eWTP as a Pilot Area to Help Overseas SMEs” (将 eWTP 作为试验区帮助海外中小企业), *Sina Technology*, May 6, 2018. Translation.

²¹⁹ “eWTP landed in Ethiopia, Jack Ma Invested US\$100 Million to Train African Entrepreneurs” (eWTP 落地埃塞俄比亚 马云投资 1 亿美元培养非洲企业家), *Sina Technology*, November 26, 2019. Translation.

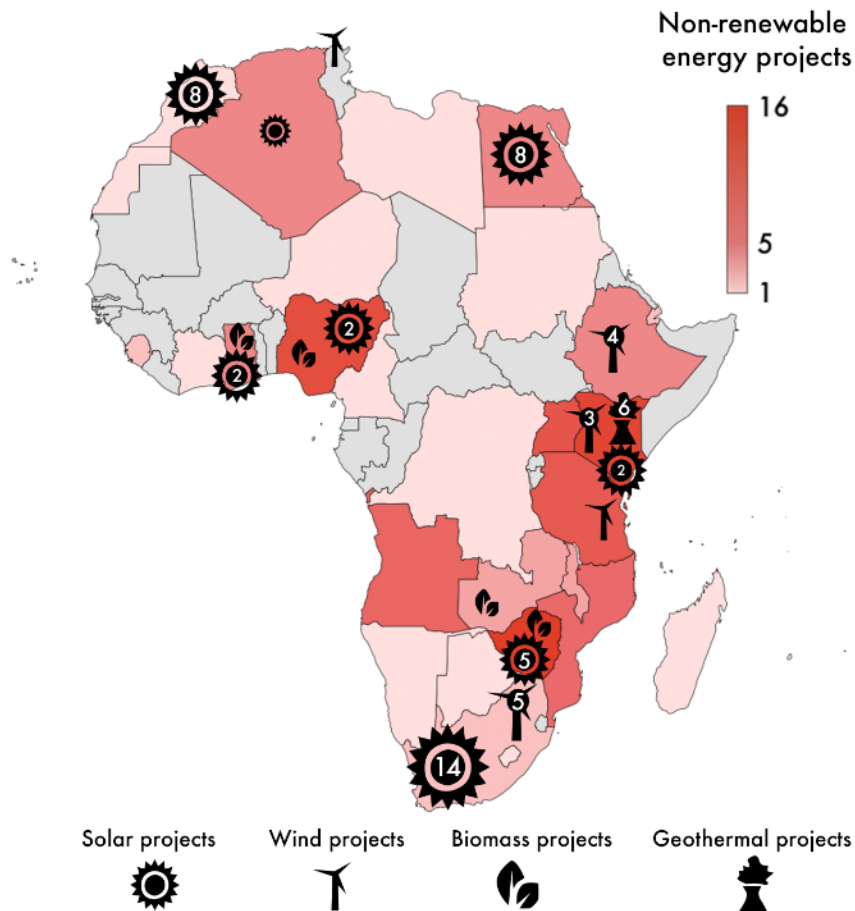
²²⁰ Cecilia Li, “Ethiopia Second in Africa to Join Alibaba-Led eWTP,” *Alizila*, December 18, 2019.

²²¹ Zhao Lei, “Fight for the Next Global Manufacturing Center: Ethiopia” (争当下一个全球制造业中心: 埃塞俄比亚调研报告), *Belt and Road Report*, March 2019. Translation.

Infrastructure and Standards

The Yaji Railway and the Electronic World Trade Platform (eWTP) exist within a larger constellation of Chinese infrastructure investments in Africa. That body of investment spans real, legacy domains and emerging ones. 70 to 80 percent of Africa’s infrastructure (e.g., roads, airports) is reportedly built by Chinese actors.²²² This section surveys Chinese investments in Africa’s physical and virtual infrastructure. It also explores the proliferation of Chinese standards for those infrastructure systems, taking Beijing’s “Three Networks One Standardization” program as well as financial technology (fintech) as case studies.

Figure 14: China-linked Energy Projects²²³



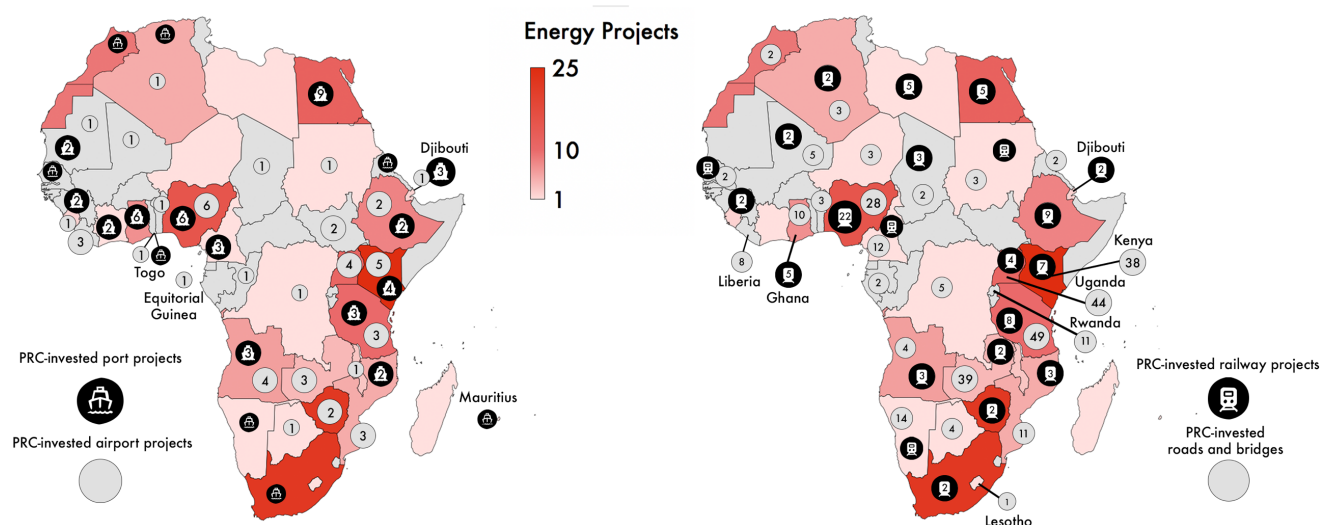
²²² Wu Fang, “Eight Actions Promote High-Quality Development of China-Africa Infrastructure Cooperation” (八大行动”促进中非基础设施合作高质量发展), *International Engineering and Labor*, 2019. Translation.

²²³ Data aggregated from a range of sources including the Economist Intelligence Unit, Business Monitor International, and press reporting and company data sourced from company public disclosures and financial records, press releases, and scrutiny of official entity ownership registrars in China and internationally.

Infrastructure projects in Africa account for some 30 percent of China’s foreign project contracting turnover.²²⁴ Meanwhile, Africa represents only four percent of China’s foreign trade and 2.4 percent of China’s FDI. Zhou Jinyan of the Chinese Academy of Social Sciences wrote in 2020 that “China has become the largest supplier of infrastructure in Africa.”²²⁵ Wu Fang of the Ministry of Commerce reports that 36.2 percent of China’s infrastructure projects in Africa are in transportation, 11.8 percent in power, and 7 percent in communications.²²⁶

Chinese government and commercial actors have invested in or built – or are in the process of investing in or building – more than 31,000 km of rail projects across 22 countries in Africa and renewable energy projects totaling over 7GW of installed capacity across nine. At least 27 African countries have planned, continuing, or completed road and bridge projects invested in, built, or operated by Chinese entities. For non-renewable energy projects, that figure is 28; for airports and airfields 23; and for ports 21. The Chinese companies involved in rail, road, air, and port projects are almost exclusively State-owned. However, power projects – and especially renewable power projects – reflect a more diverse collection of State-owned and private players (Appendix E).²²⁷

Figure 15: China-invested Physical Infrastructure Projects²²⁸



²²⁴ Wu Fang, “Eight Actions Promote High-Quality Development of China-Africa Infrastructure Cooperation” (八大行动”促进中非基础设施合作高质量发展), *International Engineering and Labor*, 2019. Translation.

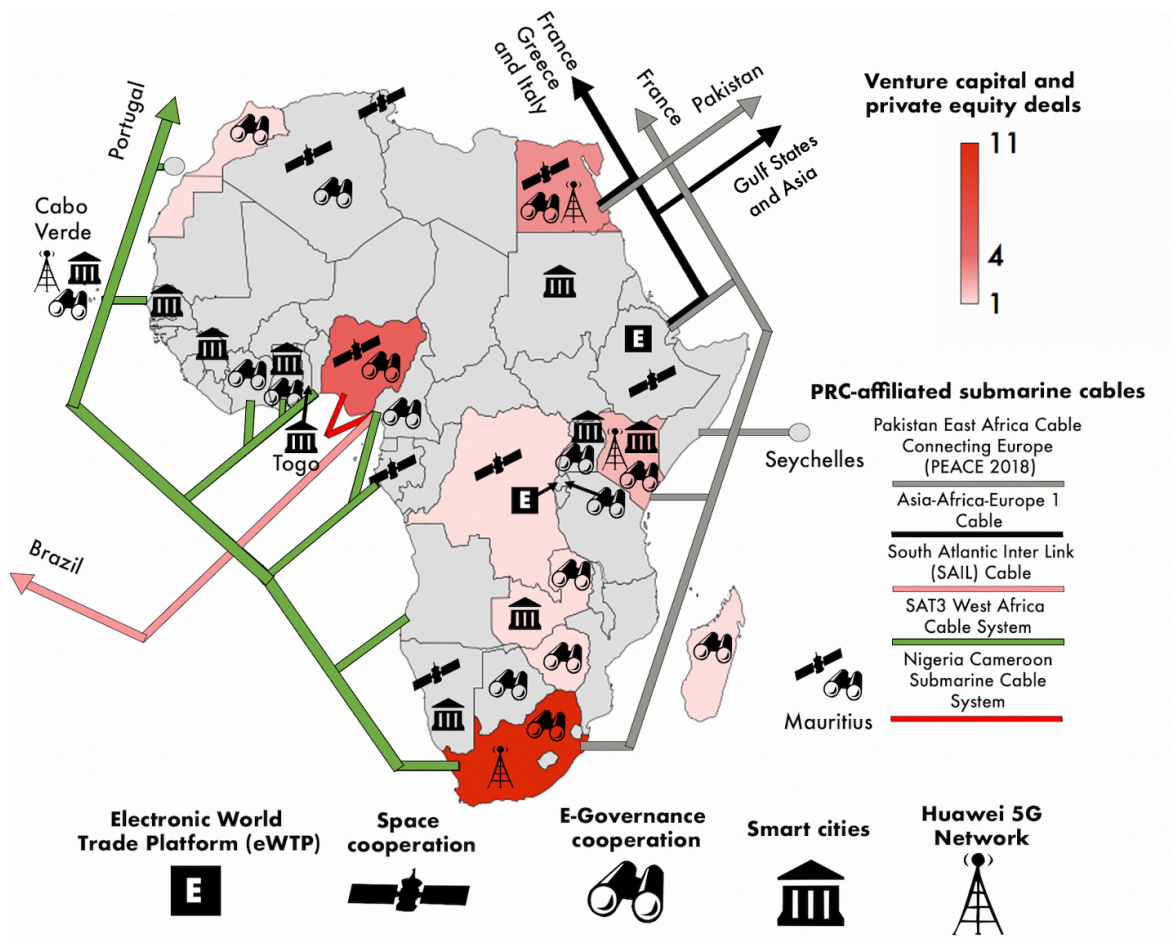
²²⁵ Zhou Jinyan, “Analysis of China’s Supply of Public Goods in Africa” (中国对非洲区域公共产品供给评析), *Contemporary World*, 2020. Translation.

²²⁶ Zhou Jinyan, “Analysis of China’s Supply of Public Goods in Africa” (中国对非洲区域公共产品供给评析), *Contemporary World*, 2020. Translation.

²²⁷ Infrastructure project data is aggregated from a range of sources including the Economist Intelligence Unit, Business Monitor International, Extractives Hub, and reporting and analysis from international institutions including the World Bank and International Monetary Fund. Company data is sourced from company public disclosures and financial records, press releases, and scrutiny of official entity ownership registrars in China and internationally.

²²⁸ Data aggregated from a range of sources spanning infrastructure project data reflected in commercial databases including Economist Intelligence Unit, Business Monitor International, and Extractives Hub. Total project figures reflect individual invested developments separately such that several may occur at a single airport or port complex over time.

Figure 16: Chinese Virtual Infrastructure Investments²²⁹



Infrastructure as Part of a Strategy: The Example of Three Networks, One Standardization
 Both physical and virtual infrastructure systems run on technical standards. Chinese investments in infrastructure may encourage selection of Chinese standards. Beijing’s “Three Networks, One Standardization Project” offers a concrete, legacy example. Launched in 2014 by Premier Li Keqiang, Three Networks, One Standardization (三网一化) orients around planning, building, and interlinking Africa’s transcontinental network of rail, highway, aviation, and industrial networks,

²²⁹ Infrastructure project data is aggregated from a range of sources including Ch. Poinssot et al., “Observatoire du Numerique Chinois, Ambassade de France en Chine,” June, 2020.; Will Green, Leyton Nelson, and Brittney Washington, “China’s Engagement with Africa: Foundations for an Alternative Governance Regime,” USCC Staff Research Report, May 1, 2020, page 11; Julie Michelle Klinger, “China, Africa, and the Rest: Trends in Space Science, Technology, and Satellite Development,” China Africa Research Initiative, May 2020; Global Chinese Official Finance Dataset, Version 1.0; and aggregation of data points from the Economist Intelligence Unit, AidData, Business Monitor International, CEIC, and reporting and analysis from international institutions including the World Bank and International Monetary Fund. Identified smart cities include both smart city projects undertaken by Chinese actors and smart city projects that use Chinese technology.

and doing so according to Chinese standards.²³⁰ Gu Dawei of the NDRC explains the underlying goal as one to promote China-Africa “industrial and infrastructure connection,” more specifically to “support connection among railway networks, ports, transnational highway projects...and provide logistics support for industrialized projects.”²³¹ As he explains it, the NDRC and relevant departments jointly guide and support Chinese enterprises’ use of infrastructure cooperation to propel industrial cooperation.²³²

Initiated one year before BRI, Three Networks, One Standardization is framed as a precursor to BRI.²³³ The program focuses on Ethiopia, Kenya, and Tanzania.²³⁴ It rests on flagship, largely EXIM-bank backed projects in rail, road, and air. All three of the rail projects – Ethiopia’s Yaji Railway,²³⁵ Kenya’s Mombasa-Nairobi Railway,²³⁶ and Nigeria’s coastal railway²³⁷ – have been built according to Chinese rail standards. While not explicitly portrayed in the context of Three Networks, One Standardization, Ethiopian Airlines has also incorporated AliPay into its app.²³⁸

The export of Chinese standards across Africa may allow Beijing to cement influence – especially industrial influence. Infrastructure built on Chinese standards tends to depend on Chinese sources for servicing and operation. Standards also give compatible Chinese systems an advantage. Chinese railways, for example, are likely to be outfitted with Chinese cars; Chinese-made smartphones come pre-loaded with Chinese payment apps that are built on and support the promulgation of Chinese technical standards.²³⁹ Standards can have compounding influence, too. The selection of standards in emerging domains in one country may influence the standards that take root regionally.

China in the Fintech Ecosystem

The fintech domain offers a case in which global standards (e.g., payment processing protocols, digital currencies) are only beginning to take shape. The African continent may play a critical role. Its development trajectory positions it to leapfrog in banking systems: Many African countries are

²³⁰ Gu Dawei, “China-Africa Three Networks, One Standardization and Production Capacity Cooperation Help Africa's Industrialization Process,” (中非“三网一化”与产能合作助力非洲工业化进程) *China Investment*, 2016. Translation.

²³¹ Gu Dawei, “China-Africa Three Networks, One Standardization and Production Capacity Cooperation Help Africa's Industrialization Process,” (中非“三网一化”与产能合作助力非洲工业化进程) *China Investment*, 2016. Translation.

²³² Gu Dawei, “China-Africa Three Networks, One Standardization and Production Capacity Cooperation Help Africa's Industrialization Process,” (中非“三网一化”与产能合作助力非洲工业化进程) *China Investment*, 2016. Translation.

²³³ Zhao Chenguang, “Construction of the Belt and Road and China-Africa Cooperation: Mutual Construction Process, Cooperation Path, and Focus,” *Journal of Liaoning University*, 2019. Translation.

²³⁴ Zhao Chenguang, “Construction of the Belt and Road and China-Africa Cooperation: Mutual Construction Process, Cooperation Path, and Focus,” *Journal of Liaoning University*, 2019. Translation.

²³⁵ Jing Yue and Huang Peizhao, “Chinese-Run Railway in Ethiopia Gives Regional Development Much-Needed Boost,” *Global Times*, February 25, 2019.

²³⁶ Mohammed Yusuf, “Cost of China-Built Railway Haunts Kenya,” *Voice of Africa News*, February 26, 2020.

²³⁷ “Coastal Railway Projects in Nigeria Adopt Chinese Standards” (尼日利亚沿海铁路项目全部采用中国标准), *Changjiang Commercial Daily*, November 21, 2014. Translation.

²³⁸ “Ethiopian Airlines Integrates Alipay into Mobile App,” *Apex*, September 17, 2018.

²³⁹ Yomi Kazeem, “Africa’s Top Phone Maker is Leading a \$40 million Investment to Win the Race for Online Payments,” *Quartz*, November 13, 2019.

proceeding straight to e-payment and mobile transactions, bypassing conventional banking and landlines.

This is a sprawling, fragmented, murky ecosystem. Fintech spans payment, lending, remittance, investment, insurance, and blockchain systems; Africa has 222 digital payment platforms alone, which is 200 more than the United States.²⁴⁰ Those platforms are predominately private and often associated with telecommunications companies or banks.²⁴¹

Chinese investors and companies – largely private rather than State-owned – are integrating into developing fintech systems on the African continent. They tend to do so through three primary avenues. First are partnerships with or investment in major African players in the fintech landscape, including banks and payment platforms. WeChat and Alipay have strategic partnerships with M-Pesa,²⁴² the top mobile money product in East Africa.²⁴³ M-Pesa also operates on Huawei's G2 Platform.²⁴⁴ In 2017, Alipay signed a strategic partnership with Zapper, then the largest mobile payment provider in South Africa; in 2019 with Nigeria-based Flutterwave,²⁴⁵ a business-to-business payments service that processed \$5.4 billion worth of transactions in 2019.²⁴⁶ Those partnerships offer Chinese players positions on Africa's fintech platforms. Banks offer more direct entry. As early as 2016, WeChat Pay established a presence in South Africa through a partnership with Standard Bank.²⁴⁷ A 2018 agreement with Kenya-based Equity Bank – which controls about 60 percent of e-commerce transactions in East Africa – allowed WeChat and Alipay access to Kenya, Uganda, Tanzania, the DRC, and Rwanda.²⁴⁸

Chinese companies also invest in Africa's fintech players: Nigeria-based mobile payment service O-Pay is majority-owned by a consortium of Chinese funders and was incubated by Opera, a Chinese company.²⁴⁹ O-Pay has a daily transaction value of about \$10 million. It is working to scale to Kenya, Ghana, and South Africa and claims to be creating "Africa's super app."²⁵⁰

²⁴⁰ Herman Smit et al, "Africa's Digital Platforms and Financial Services: An Eight-Country Overview," *Insight2impact*, March 2019.

²⁴¹ Herman Smit et al, "Africa's Digital Platforms and Financial Services: An Eight-Country Overview," *Insight2impact*, March 2019.

²⁴² Abdi Latif Dahir, "Kenya's M-Pesa Mobile Service Now Works with WeChat Pay," *Quartz*, December 3, 2018; Daniel Wolfe and Kate Fitzgerald, "Your Morning Briefing, *PaymentsSource*," March 12, 2019.

²⁴³ Jake Bright, "Africa Turns to Mobile payment as a Tool to Curb COVID-19," *Tech Crunch*, March 25, 2020.

²⁴⁴ Kenya Safaricom Migrates M-Pesa to Huawei G2 Platform, *TM Forum*, April 2015.

²⁴⁵ "Alipay App to Be Accepted in South Africa," *PYMNTS*, September 1, 2017.

²⁴⁶ Jake Bright, "African Fintech Firm Flutterwave Raises \$35M, Partners with Worldpay," *Tech Crunch*, January 21, 2020.

²⁴⁷ "WeChat Launches WeChat Wallet in South Africa," *Finextra*, November 26, 2015.

²⁴⁸ "Kenya bank to boost WeChat Pay, Alipay presence in Africa," *Xinhua News*, March 25, 2019 Alipay has entered Mauritius through a partnership with financial services provider SBM. (SBM, "SBM is the First Bank to be Introducing Alipay in Mauritius," February 27, 2018.) In February 2020, Alipay signed a cross-border remittance agreement with EcoBank, the largest pan-African bank. ("EcoBank Partners with Alipay," *Business Ghana*, February 12, 2020.)

²⁴⁹ Yomi Kazeem, "The Latest Marker of Chinese Interest in African Fintech is a \$120 Million Funding Round for OPay," *Quartz*, November 18, 2019.

²⁵⁰ Jake Bright, "Opera's OPay still plans Africa Expansion on Nigerian Super App," *Tech Crunch*, May 15, 2020.

Second, China incorporates African countries into larger digital trade regimes and platforms that influence digital economic development from the top down. Here, eWTP is the prime example: Both Rwanda and Ethiopia are part of the Alibaba-spearheaded platform. Their eWTP agreements include commitments to partner in digital economic development, especially tools like mobile payments.²⁵¹ In joining, Rwanda agreed to integrate with Alipay, as well as Alibaba's Tmall and Fliggy platforms.²⁵² Similar moves are expected of Ethiopia.²⁵³

Third, the growing presence of Chinese smart phones in Africa's market provides bottom-up influence over digital economic development. China's Shenzhen-based Transsion mobile phone company is Africa's leading smartphone producer. Its Tecno, Infinix, and Itel brands had a combined 41 percent market share by unit sales at the end of 2019, up from 33 percent at the end of 2018. The next largest player is Samsung, with a 19 percent share, followed by Huawei, with 10 percent.²⁵⁴ In November 2019, Transsion launched its own digital payments service, PalmPay, a joint venture with China's NetEase. The payments app will come pre-installed on Transsion phones, which could make it a *de facto* choice.²⁵⁵

Chinese discourse and programs in Africa suggest that the connection between infrastructure investments and Chinese technical standards is not an accident; that standard-setting on the continent is a priority. Yao Guimei notes that "interconnection and industrialization are at the core of China-Africa production capacity: Chinese standards are beginning to infiltrate Africa."²⁵⁶ He points to the EXIM Bank-funded Yaji Railway in Ethiopia that drove "Chinese standards and regulations deep into Africa" and the Nairobi-to-Mombasa railway in Kenya that "serves as a model for China's railway technology standards to go abroad."²⁵⁷ Chinese press echoes the value assigned standards. A 2017 article in *International Business Daily* declares "Chinese Standards Win in Africa."²⁵⁸ China's *Foreign Trade Journal* calls in 2018 to "let Chinese standards bloom in Africa."²⁵⁹

²⁵¹ "Entrepreneurs in Rwanda," said Alibaba's Jack Ma when Rwanda joined eWTP, "are ready to seize the opportunities offered by the digital economy. It is up to all of us to help them succeed." (Milcah Lukhanyu, "Rwanda, Alibaba sign deal to link Rwanda SMEs to AliPay, Tmall, & travel platform Fliggy," *Tech Moran*, November 2, 2018.)

²⁵² Milcah Lukhanyu, "Rwanda, Alibaba Sign Deal to Link Rwanda SMEs to AliPay, Tmall, and Travel pPlatform Fliggy," *Tech Moran*, November 2, 2018.

²⁵³ "Ethiopia Eyes cooperation with Alibaba to Promote Digital Economy," *Xinhua News* (English), November 16, 2019.

²⁵⁴ "Africa's Smartphone Market Posts Growth, But Uncertainty Around Global COVID-19 Outbreak Casts Shadow over Short-Term Prospects," IDC Research, March 5, 2020.

²⁵⁵ Yomi Kazeem, "Africa's Top Phone Maker is Leading a \$40 million Investment to Win the Race for Online Payments," *Quartz*, November 13, 2019.

²⁵⁶ Yao Guimei, "China-Africa Capacity Cooperation: Effectiveness, Problems and Prospects" (中非产能合作:成效、问题与前景), *International Economic Cooperation*, 2017. Translation.

²⁵⁷ Yao Guimei, "China-Africa Capacity Cooperation: Effectiveness, Problems and Prospects" (中非产能合作:成效、问题与前景), *International Economic Cooperation*, 2017. Translation.

²⁵⁸ Zhang Zhuomin, "Chinese Standards Win in Africa" (中国标准赢在非洲), *International Business Daily*, September 25, 2017. Translation.

²⁵⁹ Wang Lili, "Let Chinese Standards Bloom in Africa" (让中国标准在非洲绽放), *Chinese Foreign Trade*, 2018. Translation.

Case Study: Kenya

“Kenya is the country with the strongest comprehensive strength in East Africa,” wrote Yao Guimei in 2017. He calls Kenya “the best place for capacity cooperation between China and Africa.”²⁶⁰ China builds key physical and virtual infrastructure systems across Kenya.²⁶¹ Kenya is one of the demonstration zones of Three Networks, One Standardization. Beijing seeks to integrate that plan with Kenya’s “2030 Vision” development program,²⁶² therefore to ensure that the infrastructure and capacity developed as part of it are based on Chinese systems.²⁶³

Kenya’s case illustrates the dependencies that arise from China’s infrastructure construction. The case also points to the degree to which standards can cement such dependence as well as their potential to spread: Kenya’s geography, relatively industrialized status, and rapid adoption of modern technological systems position its standard choices to influence regional ones.

The Mombasa-Nairobi Railway is a flagship project of Three Networks One Standardization.²⁶⁴ State-owned China Road and Bridge Engineering (CRBC) built the railway for approximately \$3.8 billion, between 2014 and 2017, completing a \$1.5 billion extension in 2019.²⁶⁵ The railway is Kenya’s most expensive infrastructure project since its independence.²⁶⁶ Preferential loans from China EXIM Bank covered 90 percent of the project. The Kenyan government financed the remaining ten percent.²⁶⁷ The China EXIM Bank granted the loan on the condition that it approve the rail operator: The Mombasa-Nairobi Railway is operated by CRBC’s parent company, China Communications Construction Company.²⁶⁸

The Mombasa-Nairobi Railway is widely cited in Chinese discourse, in particular as a standards victory. Deng Yanting of the Chinese Academy of Social Sciences calls the rail’s “successful completion a magnificent blueprint for using modern railway to promote the interconnection of transportation facilities in East African countries,” noting that with a Chinese standard rail comes “full introduction of the entire railway industry chain of China and Chinese enterprises.”²⁶⁹ In

²⁶⁰ Yao Guimei, “China-Africa Capacity Cooperation: Effectiveness, Problems and Prospects” (中非产能合作:成效、问题与前景), *International Economic Cooperation*, 2017. Translation.

²⁶¹ China EXIM Bank has funded power, road, and rail projects in the country. China Southern Airlines and Hainan Airlines fly to Nairobi. (Gu Dawei, “China-Africa Three Networks, One Standardization and Production Capacity Cooperation Help Africa's Industrialization Process,” (中非“三网一化”与产能合作助力非洲工业化进程) *China Investment*, 2016. Translation.)

²⁶² Launched in 2007, Vision 2030 is Kenya’s blueprint for developing into an industrializing, middle income country by 2030. It orients around food security and agriculture; affordable housing, manufacturing, and healthcare. (“About Vision 2030,” Kenya Vision 2030, <https://vision2030.go.ke/about-vision-2030/>)

²⁶³ Deng Yanting, “Construction of East Africa Modern Railway Interconnection under the Lead of the Belt and Road Initiative” (一带一路倡议引领下的东非现代化铁路互联互通建设), *West Asia and Africa*, 2019. Translation.

²⁶⁴ Gu Dawei, “China-Africa Three Networks, One Standardization and Production Capacity Cooperation Help Africa's Industrialization Process,” (中非“三网一化”与产能合作助力非洲工业化进程), *China Investment*, 2016. Translation.

²⁶⁵ Xiao Zhanhua, 2007-2019 China Overseas Railway Project Information Data Set (2007–2019 年中国海外铁路项目信息数据集), *China Science Data*, 2019. Translation.

²⁶⁶ Eyder Peralta, “A New Chinese-Funded Railway in Kenya Sparks Debt-Trap Fears,” *NPR*, October 8, 2018.

²⁶⁷ “Mombasa-Nairobi Standard Line Funding Agreed,” *Railway Gazette*, 14 May 2014.

²⁶⁸ Kiarie Njoroge, “Why Chinese Bank Imposed SGR Line Operator on Kenya,” *Business Daily*, May 17, 2016.

²⁶⁹ Deng Yanting, “Construction of East Africa Modern Railway Interconnection with the Lead of the Belt and Road Initiative” (一带一路倡议引领下的东非现代化铁路互联互通建设), *West Asia and Africa*, 2019. Translation.

other words, Chinese railway standards allow Beijing to determine the industrial systems and infrastructure to which the rail connects.²⁷⁰ Deng writes that “the objective requirements for interconnected infrastructure are such that Chinese rail standards – represented by the Mombasa-Nairobi Railway – will be adopted by other railway construction projects in East Africa...The railway will continue to extend westwards. It will become a beach head and backbone for the construction of a modern railway network in East Africa.”²⁷¹

Discussion of the railway in the Kenyan and international communities is more mixed, with widespread concerns about excessive cost, insufficient utility, and rising dependence on China, as well as environmental impact.²⁷² On Friday June 19, 2020, just a week after Xi Jinping highlighted the rail project at the Extraordinary China-Africa Summit on Solidarity Against COVID-19, a Kenyan appellate court ruled that the single-sourced rail contract with CRBC was illegal.²⁷³ 87 percent of Kenya’s bilateral debt servicing payments go to China.²⁷⁴ The rail project has exacerbated Kenya’s debt balance. The railway, which cost nearly four times the original estimate and three times the international average per kilometer,²⁷⁵ has lost money since its launch.²⁷⁶ The line is intended to carry freight, but its route is largely out of sync with freight patterns.²⁷⁷ Construction, by both China and Kenya, of the special economic zones and industrial parks that the rail was intended to connect to Nairobi has consistently stalled.²⁷⁸

²⁷⁰ Deng Yanting, “Construction of East Africa Modern Railway Interconnection with the Lead of the Belt and Road Initiative” (一带一路倡议引领下的东非现代化铁路互联互通建设), *West Asia and Africa*, 2019. Translation. Yao Guimei calls the Nairobi-Mombasa railway “a model for China’s railway technology standards to go abroad.” (Yao Guimei, “China-Africa Capacity Cooperation: Effectiveness, Problems and Prospects” (中非产能合作:成效、问题与前景), *International Economic Cooperation*, 2017. Translation.)

²⁷¹ Deng places particular value in standards influence because he sees East Africa as a strategic area. He argues that “East Africa’s unique geographical location provides the necessary prerequisites for countries in the regions deeply to connect to BRI,” citing the relative efficiency and stability of the sea route from East Africa to China. “East Africa has the conditions to become an efficient conversion node on China’s international transport corridor to Africa...It can seamlessly realize the connection between land and sea, providing convenient conditions for the distribution of personnel and materials between China and Africa.” (Deng Yanting, “Construction of East Africa Modern Railway Interconnection with the Lead of the Belt and Road Initiative” (一带一路倡议引领下的东非现代化铁路互联互通建设), *West Asia and Africa*, 2019. Translation.)

²⁷² In many cases, transport via the rail is reportedly more expensive than via truck. (Jevans Nyabiage, “Contract for Kenya’s China-Funded Railway Rule Illegal,” *South China Morning Post*, June 23, 2020.) The rail line has also been condemned by environmentalists for endangering wildlife. (Rael Ombuor, “Environmentalists Protest China-Backed Rail Construction,” *VOA News*, March 1, 2018.) There have also been accusations of poor construction quality: In 2015, a Twitter account allegedly belonging to the suspended Minister of Transport posted photos of damaged SGR sections and described it as a “shoddy job.” (Eugene Okumu, “Kenya: Suspended CS Kamua Says on Twitter SGR Work Is Shoddy,” *The Star*, April 9, 2015.)

²⁷³ As the rail is already complete and operational, the effect of this ruling is uncertain. However, it may lead to attempts to break or adjust the contract or even default – and could influence future projects. (Jevans Nyabiage, “Contract for Kenya’s China-Funded Railway Rule Illegal,” *South China Morning Post*, June 23, 2020.)

²⁷⁴ COVID-19 is amplifying Kenya’s debt burden. (Cobus van Staden, “Kenya’s Standard Gauge Railway and the Dramas of Development,” *The China Africa Project*, October 17, 2019.)

²⁷⁵ Nancy Kacungira, “Will Kenya Get Value for Money from Its New Railway,” *BBC Africa*, June 8, 2017.

²⁷⁶ Its \$126 million in revenue in 2019 did not meet the \$170 million in operating costs. (“Kenya’s New Railway Cuts Losses, But Still a Long Way from Breaking Even,” *Global Construction Review*, April 29, 2020.)

²⁷⁷ Press accounts write that the rail connects Nairobi to “nowhere.” (Duncan Miriri, “Kenya Opens \$1.5 Billion Chinese-Built Railway Linking Rift Valley Town and Nairobi,” *Reuters*, October 16, 2019.)

²⁷⁸ David Herbling and Dandan Li, “China’s Built a Railroad to Nowhere in Kenya,” *Bloomberg*, July 18, 2019. Should industry not develop along the railway, the line may prove an economic disaster for Kenya. The outcome

Okiya Omtata, a Kenyan activist who launched the lawsuit against the rail that led to the June 19 ruling, emphasizes standards. In a February 2020 *Voice of America* interview, he explained that Chinese rail standards lock Kenya into China's industry chain: "It's a Chinese standard. So, we cannot go to Brazil to buy spares for this. We must buy things from China. We are being tied to China forever."²⁷⁹

Beijing also exports virtual infrastructure systems and their standards to Kenya. Huawei is in the process of building a smart city in Nairobi with a corresponding data center in nearby Konza.²⁸⁰ Kenya's Safaricom mobile network, which is 35 percent owned by the Kenyan government,²⁸¹ has announced that it intends to rely on Huawei in establishing a 5G network in the country.²⁸² Alipay and WeChat have established presences in Kenya both indirectly, through strategic partnerships with M-Pesa²⁸³ – which itself operates on Huawei's G2 Platform²⁸⁴ – and directly, through an agreement with Equity Bank.²⁸⁵ That agreement was signed in response to growing trade between Kenya and China, and just a week after the Central Bank of Kenya announced that it was considering using RMB as a reserve currency.²⁸⁶

These information infrastructure systems are areas in which Kenya leads in Africa. The standards that Kenya adopts may influence those of its region. This is already proving true in the case of Chinese fintech and Equity Bank, which has a presence across East Africa. Yao Guimei notes that Kenya benefits from "active re-export trade," with it the ability to expand markets and market

hinges in large part on China continuing industrial investment. Ruud Elmendorp, "Kenya Opens Second Phase of Railway Project," *Voice of Africa News*, October 16, 2019. And China has decided not to fund a planned third face of the project, which may suggest leanness about continued investment. (Cobus van Staden, "Kenya's Standard Gauge Railway and the Dramas of Development," *The China Africa Project*, October 17, 2019.) Direct debt aside, the rail project thus risks having increased Kenya's dependence on China. Should Chinese investment ever create the industrial demand necessary to make the railway profitable, the resultant industrial chain would be largely governed by China. Kenya may receive immediate economic return, but on China's terms.

²⁷⁹ Mohammed Yusuf, "Cost of China-built Railway Haunts Kenya," *Voice of America*, February 26, 2020.

²⁸⁰ Those are to include a national cloud data center, intelligent ICT network, and public safety and intelligent transportation systems, as well as government and enterprise cloud services. ("Kenya and China sign nearly \$700 million in IDC agreement" (肯尼亚同中国签订近7亿美元IDC协议), China IDC News, June 13, 2019. Translation.)

²⁸¹ "Shareholders," Safaricom, Safaricom.co.ke.

²⁸² Eunniyah Mbabazi, "Safaricom to Use Huawei for 5G Rollout," *Kenyan Wall Street*, February 20, 2020.

²⁸³ Abdi Latif Dahir, "Kenya's M-Pesa Mobile Service Now Works with WeChat Pay," *Quartz*, December 3, 2018.; Daniel Wolfe and Kate Fitzgerald, Your Morning Briefing, *PaymentsSource*, March 12, 2019.

²⁸⁴ "Kenya Safaricom Migrates M-Pesa to Huawei G2 Platform," *TM Forum*, April 2015.

²⁸⁵ "Jack Ma's Alipay and WeChat to unsettle Mpesa with Kenya entry," *The Exchange Africa*, June 19, 2018.

²⁸⁶ "Kenya bank to boost WeChat Pay, Alipay presence in Africa," *Xinhua*, March 25, 2019. These recent developments in information technology cooperation build on a long-standing history. Since the early 2000s, China has provided Kenya with funds necessary to build modern information infrastructure – ensuring in exchange that those be contracted and operated by Chinese companies. In 2005 and 2006, ZTE undertook China EXIM Bank-funded e-government projects in Kenya. In 2012, China EXIM Bank funded Kenya's national fiber optic infrastructure construction, undertaken by Huawei. That same year, China funded Kenya's effort to install surveillance systems across its major cities and towns. The surveillance equipment was provided by Nanjing Les Information Technology. (AidData. 2017. Global Chinese Official Finance Dataset, Version 1.0.) The Central Bank of Kenya has not to date taken concrete action to adopt the RMB as a reserve currency, but the idea remains frequently discussed. Per Central Bank of Kenya Governor Patrick Njoroge in 2018, "It is inevitable that Kenya will include the Chinese yuan as a reserve currency. The only question is when..." (Martin Siele, "Why Kenya Could Take Up Chinese Yuan as Reserve Currency," *Kenyans.co.ke*, June 14, 2018.)

access across the continent and internationally.²⁸⁷ He explains that in Kenya, China can use industrial infrastructure as well as “national or regional transportation, communications, power, and other infrastructure operation, construction, and management to leverage the country’s nodal status and enhance regional radiation power. Or [China] can establish logistics centers to develop Chinese marketing networks in Africa, build channel to export Chinese goods, and install enterprises to provide services and expand exports.”²⁸⁸ Qiao Rui, Director of the Information Standards Research Office of the Ministry of Industry and Information Technology’s Institute of Electronic Science and Technology Information, makes a similar argument in the virtual domain. “Kenya is the leader on the African continent in terms of technology introduction and progress.”²⁸⁹ Qiao highlights Kenya’s adoption of mobile payment, smart transportation systems, and disaster relief platforms: “Kenya directly skipped the fixed network and developed the mobile network.”²⁹⁰ Kenya’s platforms, he continues, have proliferated across Africa and to other developing countries in the Middle East, Eastern Europe, and Asia.

²⁸⁷ Yao Guimei, “New Challenges and Strategic Planning for Chinese Investment in Africa” (中国在非洲投资的新挑战及战略筹划), *International Economic Cooperation*, 2015. Translation.

²⁸⁸ Yao Guimei, “New Challenges and Strategic Planning for Chinese Investment in Africa” (中国在非洲投资的新挑战及战略筹划), *International Economic Cooperation*, 2015. Translation.

²⁸⁹ Qiao Rui, “Kenya-Nairobi: How African countries Can Achieve Leapfrog Development” (肯尼亚: 内罗毕: 非洲国家如何实现跨越式发展), *Smart Buildings and Smart Cities*, 2017. Translation.

²⁹⁰ Qiao Rui, “Kenya-Nairobi: How African countries Can Achieve Leapfrog Development” (肯尼亚: 内罗毕: 非洲国家如何实现跨越式发展), *Smart Buildings and Smart Cities*, 2017. Translation.

Security Cooperation

China's infrastructure investments also have implications for its security engagement on the continent. China's conventional military presence on the African continent remains limited (Appendix F).²⁹¹ However, China's military-civil fusion (MCF) program provides both theoretical and mechanical basis for the transfer of resources and presence between military and commercial domains.²⁹²

MCF is a government strategy.²⁹³ As a concept, MCF revolves around creating a dual flow of resources between Chinese commercial and security actors by sharing technology, know-how, and information.²⁹⁴ MCF is implemented through a corresponding institutional apparatus.

Many of the Chinese companies building and operating infrastructure in Africa are part of the MCF program. For example, Sinohydro, which has participated in the construction of airports in Liberia, Botswana, Mali, and the DRC, has an MCF management department.²⁹⁵ China Railway Construction Corporation – which has developed or is developing at least 14 rail projects across Africa – describes itself as “actively implement[ing]” the military-civil fusion strategy.”²⁹⁶ AVIC, which has participated in the construction of airports in Zambia, Angola, and Benin, is a State-owned aerospace company closely affiliated with the State Administration for Science, Technology and Industry for National Defense (SASTIND). Huawei, which invests in and builds African telecommunications networks, smart cities, submarine cables, and e-governance systems, integrates into and cooperates with the MCF apparatus.²⁹⁷ Their MCF participation entails information sharing with and direction from Beijing's security apparatus.²⁹⁸ AVIC and Huawei have been designated as Chinese military-linked companies by the U.S. Department of Defense.²⁹⁹

²⁹¹ See, for example, Paul Nantulya, “Testimony Before the U.S.-China Economic and Security Review Commission Hearing on: “China's Strategic Aims in Africa,” May 20, 2020.

²⁹² U.S. Department of State, “Military Civil Fusion and the People's Republic of China,” May 2020.

²⁹³ In 1999, Hu Jintao formally declared MCF a strategic concept; in 2015, Xi Jinping elevated MCF to national-level strategy (“Xi Jinping: Upgrading the Development of Military-Civil Fusion to a National Strategy,” (习近平：把军民融合发展上升为国家战略), *Beijing Times*, March 13, 2015. Translated.)

²⁹⁴ Ma Qing Feng, “Research on the Synergy Between Defense Economy and National Economy” (中国国防经济与国民经济同共促研究). Henan University, 2013.

²⁹⁵ Sinohydro, “Announcement on the Open Competition of the Deputy Director of the Military and Civil Integration Management Department of Sinohydro” (关于公司军民融合管理部副主任岗位公开竞聘的公告), August 15, 2019.

²⁹⁶ China Railway Construction Group, “China Railway Construction Group Vigorously Develops the Military-Civilian Integration Market” (中铁建设集团大力开拓军民融合市场), July 12, 2017. The United States Department of Defense has also classified Huawei as a military company. (Qualifying Entities Prepared in Response to Section 1237 of the National Defense Authorization Act for Fiscal Year 1999 (Public Law 105-261), unclassified June 12, 2020.)

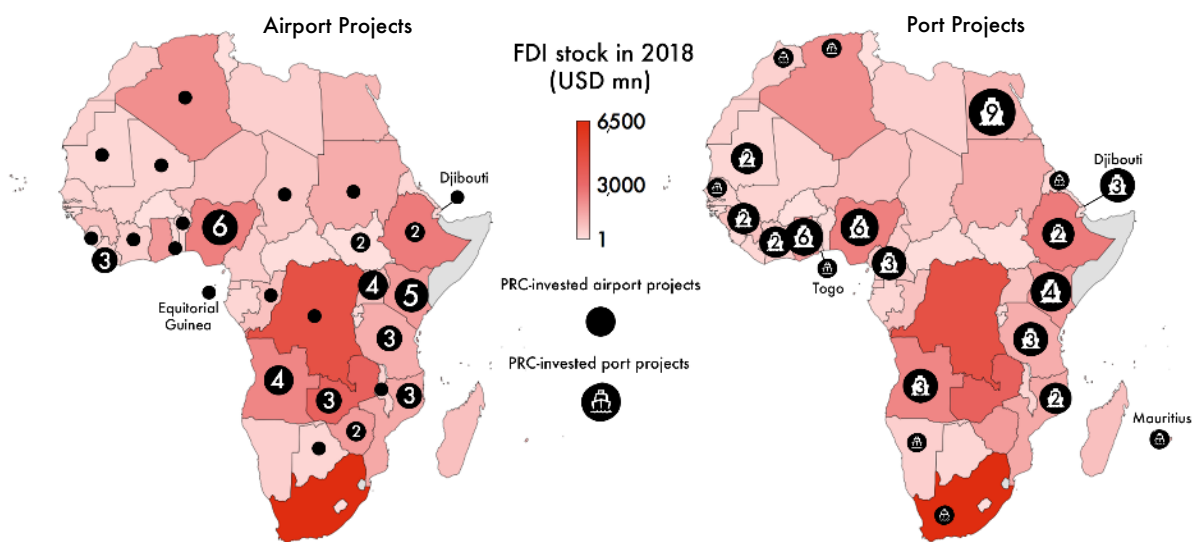
²⁹⁷ See, for example, “Huawei Invests 66 million Yuan in CLP Equipment and Holds 8% of Shares” (华为出资 6600 万元入股中电仪器), *Sina Finance*, April 7, 2020; The United States Department of Defense has also classified Huawei as a military company. U.S. Department of Defense issued List of “Communist Chinese Military Companies” Operating Directly or Indirectly in United States Pursuant to Section 1237 of the National Defense Authorization Act for Fiscal Year 1999.

²⁹⁸ For discussion of a relevant domestic example, see “Military-Civil Fusion in Jixi Realizes Information Sharing” (鸡西军分区军民融合实现信息共享), *Xinhua*, April 26, 2016. Translated.

²⁹⁹ U.S. Department of Defense, Qualifying Entities Prepared in Response to Section 1237 of the National Defense Authorization Act for Fiscal Year 1999, Cleared for Open Publication, June 12, 2020.

China's existing, MCF invested, commercial and civilian infrastructure in Africa could provide a mature foundation for the People's Liberation Army (PLA), should the systems be integrated with China's security presence on the continent. For example, China has invested in, operates, or builds ports in at least 34 African countries.³⁰⁰ These port investments constitute footholds that could be converted to security ends. China has a clear interest in protecting its investments on the ground in Africa. That interest extends to the sea lines of communication (SLOCs) over which Chinese resources flow. Key port positions on Africa's eastern coastline (e.g., the Djibouti Doraleh container terminal) would support this defensive objective. Should Beijing wish more readily to project power offensively in Africa's region, it would require additional maritime positions. China's \$590 million investment in a PLA Navy (PLAN) operated base in Djibouti, the PLAN's first such overseas outpost, is one tangible manifestation in this direction.

Figure 17: Chinese-invested Airport and Port Infrastructure Projects in Africa³⁰¹



Information infrastructure may come with even more immediate and extensive security implications – and ones that are less readily monitored. Information-sharing among military and civilian is a core tenet of MCF.³⁰² The integration of Chinese information systems in Africa, like

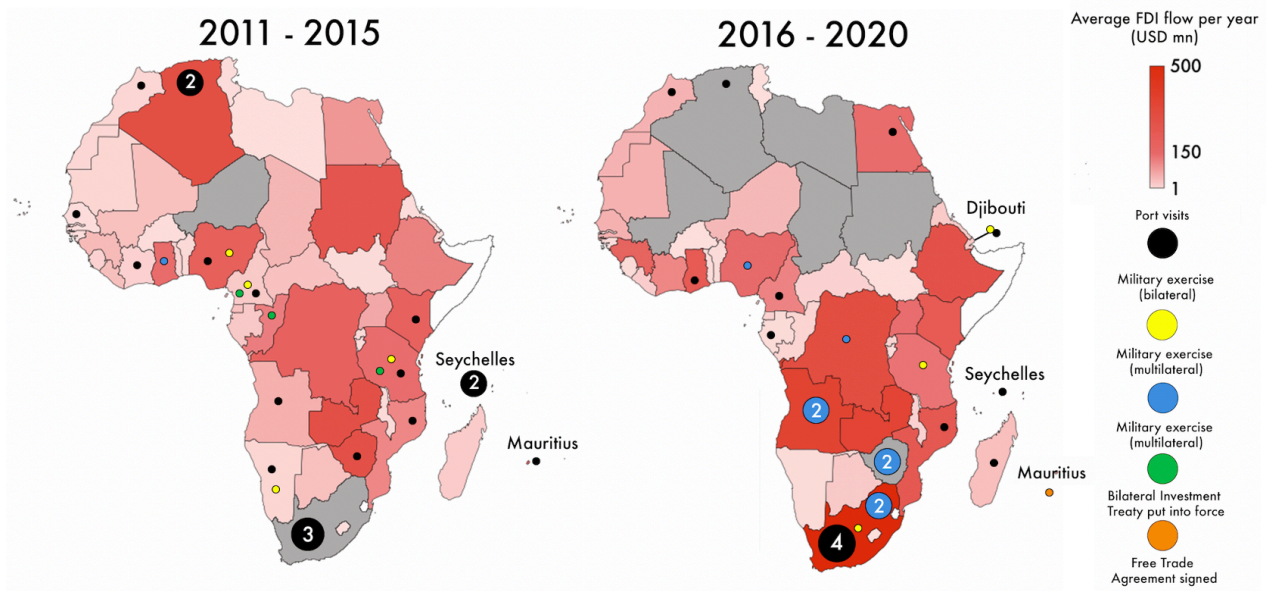
³⁰⁰ The largest examples align directly with China's commercial interests: Port projects in Angola, DRC, and Tanzania help to integrate supply chains while delivering critical security positions on either side of the African continent.

³⁰¹ Port and airport data is aggregated from Judd Devermont et al., "Assessing the Risks of Chinese Investments in Sub-Saharan African Ports," June 4, 2019, *CSIS Commentary*; Gordon Pirie, "China and Aviation in Africa: Context, Thrust, Novelty," *African Geographical Review*, Volume 39, April 6, 2019; and data from primary and secondary sources including Business Monitor International, AidData, and Chinese-language press coverage of individual companies and projects. Total project figures reflect individual invested developments separately such that several may occur at a single airport complex over time. The port projects noted in land-locked Ethiopia reflect dry ports. This aggregation excludes projects and investments that have been announced but for which evidence of progress could not be verified and projects that appear limited to minor refurbishment of existing facilities.

³⁰² Discussion of the role of information sharing and related information technologies in military-civil fusion can be found in Wu Xixin and Huang Jin, *Defense Economics (国防经济学)*. Beijing: Military Sciences Press, 2013; Li Liang, "Research on the Impact of Information Technology on the Scale of National Defense Economy," National

Huawei's, with China's military system could provide the PLA an information advantage. Such integration could also compound the security gains to be redeemed from infrastructure investments. For example, should the port information systems that China builds in Africa be connected to military systems, the ports could provide security value even without being converted them into operational bases.

Figure 18: China's FDI and Military Exercises in Africa, 2001-2020³⁰³



Despite the foundation for MCF-relevant information infrastructure systems, China's conventional military footprint in African countries remains, as is true globally, relatively limited.³⁰⁴ China has provided the African Union some \$100 million in military aid to support the establishment of an African Standby Force.³⁰⁵ China has also invested in military logistics and training facilities in Cameroon, Somalia, and Tanzania as well as in consistent security cooperation with Angola, the DRC, and Zimbabwe.³⁰⁶ Djibouti is home to a PLA Army Support Base, the Chinese military's first overseas base. Recent U.S. Department of Defense reporting suggests that the PLA may have

University of Defense Technology, 2006; Zhu Heping. "National Security and National Defense Economic Development," Huazhong Normal University, 2005.

³⁰³ FDI data unavailable for 2001, 2002, 2019, 2020. Gray shading indicates negative average FDI flow. Data sourced from Data sourced from "Chinese FDI Flow to African Countries." Washington, DC: China Africa Research Initiative, Johns Hopkins University School of Advanced International Studies; "Diplomatic Agenda." Ministry of Foreign Affairs of the People's Republic of China; "China Military." Chinese People's Liberation Army.

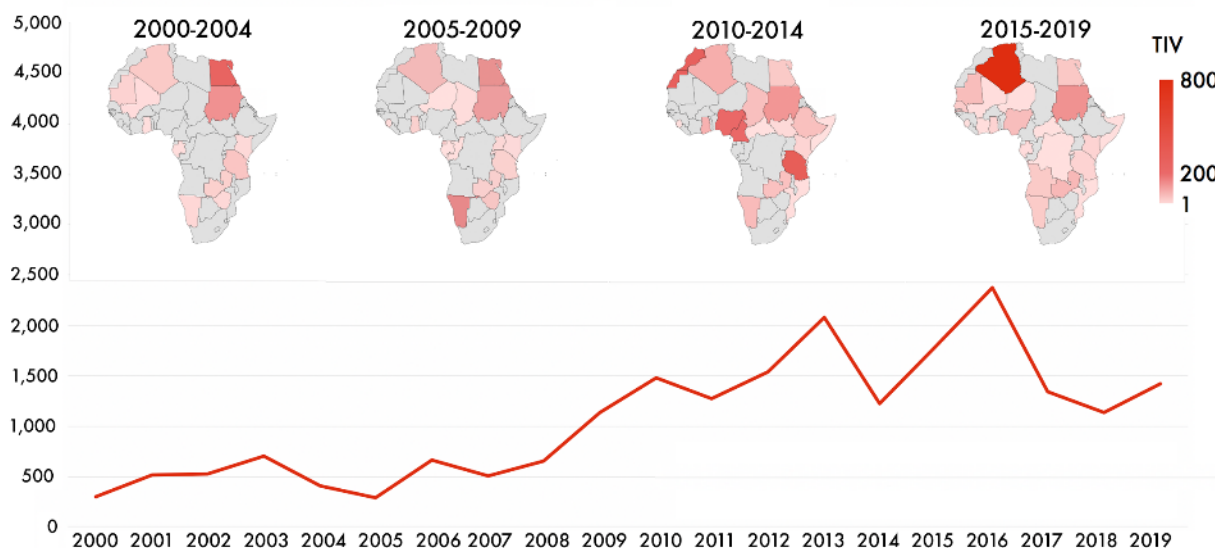
³⁰⁴ See, for example, Paul Nantulya, "Testimony Before the U.S.-China Economic and Security Review Commission Hearing on: "China's Strategic Aims in Africa," May 20, 2020.

³⁰⁵ "AU Official Hails China-Africa Peace, Security Forum to Drive Africa's Stability," *Xinhua News*, July 15, 2019.

³⁰⁶ Michael Kovrig, "China Expands Its Peace and Security Footprint in Africa," International Crisis Group, October 24, 2019; "Chinese-Built Military Training Centre Opens in Tanzania," *DefenceWeb*, February 13, 2018.

designs on establishing similar, formal basing structures in Angola, Kenya, the Seychelles, and Tanzania.³⁰⁷

Figure 19: China’s Arms Transfers to Africa (Trend Indicator Value)³⁰⁸



Peacekeeping offers an exception to this limited footprint.³⁰⁹ China engages actively in peacekeeping efforts in Africa, part of a general expansion in its global peacekeeping presence over the past ten years.³¹⁰ China’s contributions to UN missions in Africa date back to a 1989 peacekeeping operation in Namibia.³¹¹ Today, China deploys peacekeepers to the Central African Republic, DRC, Mali, Sudan, South Sudan, and Western Sahara, constituting the largest contributor of peacekeeping forces to the continent of any current Security Council member. Past earlier efforts have included anti-piracy missions as well as security monitoring in Liberia.³¹²

Figure 20: China’s Arms Transfers (TIV) and Security Interactions in Africa³¹³

³⁰⁷ Office of the Secretary of Defense, “Annual Report to Congress: Military and Security Developments Involving the People’s Republic of China,” U.S. Department of Defense, 2020.

³⁰⁸ Trend-indicator value measures the volume of deliveries of conventional weapons, measuring transfers of military capabilities rather than the financial values of arms transfers. Data sourced from “SIPRI Arms Transfers Database.” SIPRI. Stockholm International Peace Research Institute.

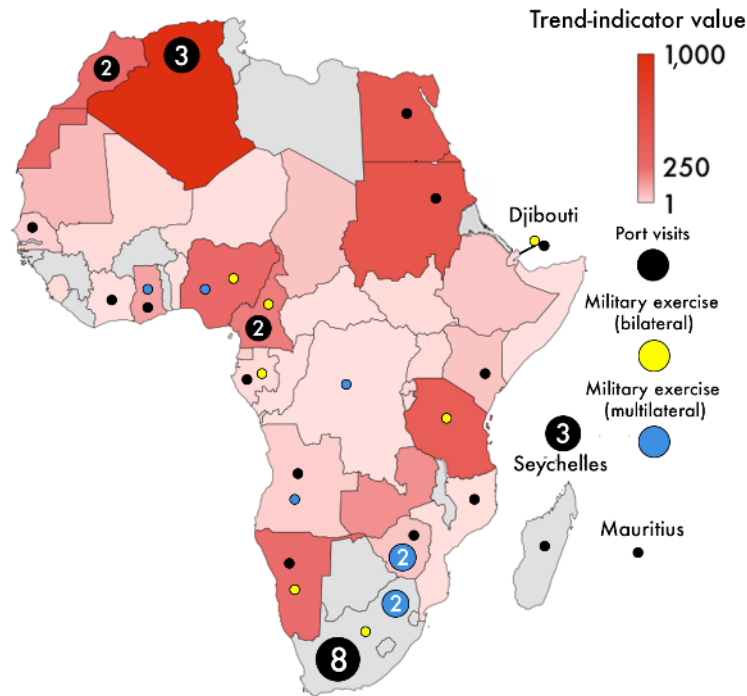
³⁰⁹ Given the common objectives of UN peacekeeping missions, they do not necessarily correspond to areas prioritized by Chinese commercial actors for economic return.

³¹⁰ China Country Profile. United Nations Peacekeeping. China has steadily increased its contributions since then to become the largest contributor of permanent UNSC members to the UN’s peacekeeping budget. China has committed over 40,000 troops to some couple dozen UN missions and currently has over 2,500 committed to active UN peacekeeping missions. (Michael Kovrig, “China Expands Its Peace and Security Footprint in Africa,” International Crisis Group, October 24, 2019.)

³¹¹ Yasuhiro Matsuda, “China’s UN Peacekeeping Operations Policy: Analysis of the Factors behind the Policy Shift toward Active Engagement. International Circumstances in the Asia-Pacific Series (China),” Japan Digital Library, March 2016.

³¹² “UN Hails Chinese Peacekeepers’ Monumental Efforts in Liberia,” *Xinhua News*, November 7, 2015.

³¹³ “SIPRI Arms Transfers Database.” SIPRI. Stockholm International Peace Research Institute; “China Military.” Chinese People’s Liberation Army.



While these are limited in scope, China also engages in arms sales and joint exercises with African countries. Chinese arms exports flow to a diverse set of African countries including Algeria, Angola, Egypt, Kenya, Namibia, Nigeria, and Tanzania. China pursues naval engagement with some of its major energy and mineral partners in Africa. In November 2019, Beijing undertook a joint exercise with South Africa and Russia in South African water: This was one of China’s most complex overseas exercises to date.³¹⁴ China has conducted port calls all along Africa’s coast, including in Angola and South Africa.

Liberia Case Study

“China and Liberia relations have entered the best period in their history,” reads a 2018 article in China’s *Journal of the Armed Police College*.³¹⁵ In 2018, China was Liberia’s second largest source of imports and fifth largest export destination – and ranked as Liberia’s fastest growing import and export market by volume of trade.³¹⁶ Those economic ties have emerged since 2003, alongside, building on, and even appearing to motivate China’s participation in peacekeeping operations in Liberia. Trade volume between the two countries rose from \$68.14 million in 2001 to \$1.8 billion in 2009. In 2018, it stood at over \$2 billion, of which Liberian imports from China accounted for \$1.9 billion.³¹⁷

Most of the Chinese economic activity in Liberia revolves around minerals, especially iron ore, and forestry. Fifty-three percent of Liberia’s exports to China in 2018 were wood, 45 percent minerals.³¹⁸ In 2009 CAD Fund-owned China Union acquired Liberia’s Bong iron ore mine – with

³¹⁴ “S. African Navy Hosts Russia, China for Maritime Exercise,” *Xinhua*, November 26, 2019.

³¹⁵ Kong Weiliang et al., “Research on Police Law Enforcement Capacity Building in Liberia Peacekeeping Mission Area” (利比亚维和任务区警察执法能力建设研究), *Journal of the Armed Police College*. Translation.

³¹⁶ “Liberia,” Observatory of Economic Complexity.

³¹⁷ UN Comtrade data from 1992-2018.

³¹⁸ World Bank World Integrated Trade Solution.

it an estimated 304 million tons of iron ore reserves – for \$2.6 billion.³¹⁹ Between 2010 and 2018, Chinese imports of minerals from Liberia grew from \$16 million to \$40 million.³²⁰ China has also funded development of Liberia’s Monrovia port designed to facilitate the transportation of iron ore.³²¹ Of the 23 Chinese-funded companies operating in Liberia in 2018, the majority operated in mineral development, engineering, agriculture, and forestry.³²²

The ties come despite a strained history: Beijing and Liberia cut off relations twice between 1989 and 1997, both times over Taiwan.³²³ But in October 2003 – two months after the Second Liberian Civil War sent former Liberian president Charles Taylor into exile – the new government dropped diplomatic ties with Taiwan and opened relations with China.³²⁴ The UN Security Council had authorized a peacekeeping mission to Liberia one month earlier. Beijing deployed a first team of peacekeepers to Liberia under that mission in November 2003.³²⁵ Over the next 14 years, China sent over 10,000 officers and soldiers to Liberia, comprising some 20 percent of the UN force.³²⁶ The Chinese contingent focused predominantly on medical services and infrastructure, namely road, construction, repair, and maintenance.³²⁷

³¹⁹ That agreement granted China Union preferential tax treatment and gave no equity stake to Liberia’s State-owned mining company, though such a stake could have been claimed. (Guillaume Moumoni, “China and Liberia: Engagement in a Post-Conflict Country 2003-2013,” South African Institute of International Affairs: April 2014.)

³²⁰ World Bank World Integrated Trade Solution.

³²¹ Yu Tao, “Foundation Construction and Design Optimization of a Stacker and Reclaimer for an Iron Ore Project in Liberia” (利比里亚某铁矿石项目堆取料机基础施工及设计优化), *China Water Transport*, 2016., Translation.

³²² Wang Wenbo et al., “Analysis of Liberia's Forestry Development and China-Liberian Forestry Cooperation under the Background of One Belt and One Road” (一带一路背景下利比里亚林业发展状况及中利两国林业合作探析), *World Forestry Research*, 2018. Translation. A 2018 article in the *Journal of the Armed Police College* deals similarly with the question of iron ore. (“Research on Police Law Enforcement Capacity Building in Liberia's Peacekeeping Mission Area” (利比里亚维和任务区警察执法能力建设研究), *Journal of the Armed Police College*, 2018. Translation.)

³²³ Janka Oertel, *China and the United Nations*, Bloomsbury Publishing, 2015.

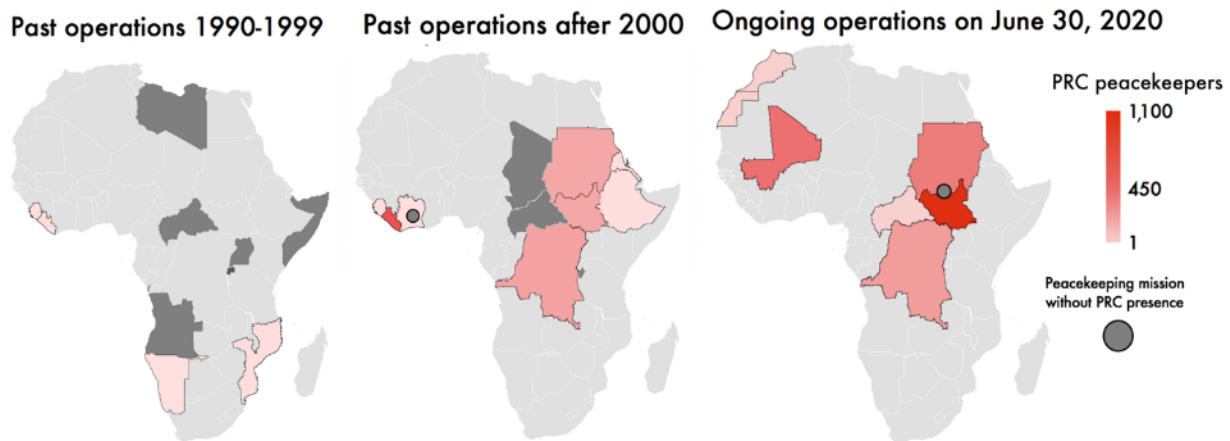
³²⁴ “Taiwan Plays Down Liberia Blow,” *BBC News*, October 13, 2003.

³²⁵ Kossi Ayenagbo et al, “China’s Peacekeeping Operations in Africa: From Unwilling Participation to Responsible Contribution,” *African Journal of Political Science and International Relations*, 6(2), February 2012, 27-28. Taiwan’s leadership blamed Liberia’s diplomatic reversal on China’s lobbying in the United Nations. (“Taiwan plays Down Liberia Blow,” *BBC News*, October 13, 2003.)

³²⁶ “After 13 Years, the Last Batch of China's Peacekeeping Officers and Soldiers in Liberia to Return Home” (历时 13 年, 最后一批我赴利维和官兵回国), *Xinhua News*, March 1, 2017. Translation.

³²⁷ PRC eacekeepers in Liberia reportedly repaired over 7,500 kilometers of road (“After 13 Years, the Last Batch of China's Peacekeeping Officers and Soldiers in Liberia to Return Home” (历时 13 年, 最后一批我赴利维和官兵回国), *Xinhua News*, March 1, 2017. Translation.) The peacekeeping force also reportedly led construction of the Bailey Bridge, a key point of access to the University of Liberia. (Song Xuan, My "Two-Sided Bond" with The President of Liberia (我与利比里亚总统的“两面之缘”), *People's Liberation Army Daily*, 2011.)

Figure 21: China's Participation in UN Peacekeeping Operations in Africa³²⁸



Beijing has provided other aid to Liberia since 2003, distinct from its peacekeeping missions but in some cases leveraging security mechanisms and building off of the peacekeeping mission's foundation. Between April 2014 and June 2015, Beijing delivered over \$120 million worth of aid to Africa for Ebola control efforts, chiefly in Guinea, Guinea Bissau, Liberia, and Sierra Leone. Assistance directly to Liberia included medical supplies, dispatch of technical expert groups, direct financial aid, food aid, and the construction of a treatment center.³²⁹ That treatment center was operated by the PLA from 2014 until 2015 before being formally transferred to the Liberian government in May 2015.³³⁰

Beijing has also developed infrastructure projects for Liberia, including a Confucius Center³³¹ at the University of Liberia launched in 2008, an agricultural technology demonstration center, and a series of road projects.³³² The peacekeeping presence clearly interacted with these infrastructure projects. Chinese media coverage describes cooperation between the China Railway Fifth Bureau

³²⁸ "Troop and Police Contributors." United Nations Peacekeeping. United Nations. Updated May 2020; "List of Past Peacekeeping Operations" United Nations Peacekeeping. United Nations. Chinese personnel deployed at the maximum deployment of UNMIS — which ended on the day South Sudan declared independence — are divided evenly between Sudan and South Sudan on this map for visual purposes

³²⁹ Meibo Huang et al., "China's Aid to Africa's Fight Against Ebola." *South-South Cooperation and Chinese Foreign Aid*, December 7, 2018. China has also assisted Liberia's education program: Beijing launched a university campus in 2010 and has set up educational exchange programs. (Guillaume Moumoni, "China and Liberia: Engagement in a Post-Conflict Country 2003-2013," South African Institute of International Affairs Global Powers and Africa Programme: April 2014.)

³³⁰ Yang Li et al., "Protection of Medical Teams in the Chinese Ebola Treatment Center, Liberia: A Qualitative Study." *Infectious Diseases of Poverty*, August 16, 2018. In September 2014, the PLA dispatched three Chinese military medical teams, for a total of about 500 people, to Sierra Leone and Liberia to help with Ebola treatment efforts. (Ibid.)

³³¹ Confucius Centers or Confucius Institutes are educational exchange and programming efforts in foreign countries that are organized and funded by the Chinese Ministry of Education. For context on connections between Confucius Institutes and the Chinese Communist Party's United Front Work Department, see Alex Joske, *The Party Speaks for You*, ASPI, June 9, 2020.

³³² Hu Qiliang, "Research on the Promotion of Chinese in Liberia" (利比里亚汉语推广调查研究), *Journal of Changsha Railway University*, 2012. Translation.

and the Chinese peacekeeping team in Liberia during construction of the Hafi Highway Project.³³³ In 2017, the fifth Chinese peacekeeping police team to Liberia and Chinese-funded enterprises held a joint Party day focused on BRI. At that event, representatives from the peacekeeping force and the Party branch of Chongqing Foreign Construction (Group) Co., Ltd signed a joint construction agreement.³³⁴ In 2018, the Confucius Institute at the University of Liberia reported “close cooperation” with the Chinese peacekeeping team: “The two parties cooperate, communicate, and support each other... The joint work carried out by the Chinese peacekeeping police riot team in Liberia and the Confucius Institute at the University of Liberia has been highly praised by the Chinese Embassy in Liberia and Chinese-funded enterprises...”³³⁵

Wang Wenbo of the State Forestry Administration suggests a relationship between China’s investment in Liberia’s resources and its aid to the country in a 2018 article about Sino-Liberian cooperation. He explains first that Liberia is rich in mineral and forestry resources; second that China’s demand for those products, especially wood, has risen dramatically in recent years; third that “China has provided a full range of selfless assistance to Liberia, especially during the Ebola epidemic;” therefore that “it is an urgent hope that Chinese companies will invest in Liberia’s forestry to help the country develop rubber and wood.”³³⁶ At the 2009 China Liberia Investment and Trade Symposium, Liberia’s Vice President thanked Beijing for its contributions to Liberia’s post-war reconstruction and invited Chinese companies to invest in the country, especially in mining, agriculture, energy, and construction.³³⁷

If the Vice President’s language suggests that economic relations between China and Liberia appear to build off of security ties, the reverse is also true. A 2018 article in China’s *Journal of the Armed Policy Academy* argues that strong security relations and influence of Chinese peacekeepers in Liberia are necessary to safeguard China’s economic interests in the country.

The stock of Chinese-funded enterprises’ investment projects in Liberia continues to increase...The Chinese peacekeeping police can use the patrol time to increase patrols of Chinese-funded enterprises and Chinese-inhabited areas...Strive to boost the safety and confidence of Chinese people, create a safe atmosphere, and ensure the safety of Chinese people and Chinese funded enterprises in Liberia.³³⁸

³³³ Xie Yongbin, Expansion of Party Building Projects Abroad (党建在境外项目的拓展), *Enterprise Civilization*, 2018, Issue 4. Translation.

³³⁴ “The Fifth Peacekeeping Anti-Riot Team in Liberia and Chinese-Funded Enterprises Launched Joint Creation and Joint Construction Theme Party Day Activities” (第五支驻利维和防暴队与中资企业开展联创联建主题党日活动), *Xinhua News*, May 22, 2019. Translation.

³³⁵ Confucius Institute at the University of Liberia, “Close Cooperation with the Chinese Peacekeeping Police Riot Team in Liberia” (与中国驻利比里亚维和警察防暴队开展密切合作), June 1, 2018. Translation.

³³⁶ Wang Wenbo et al., “Analysis of Liberia's Forestry Development and China-Liberian Forestry Cooperation under the Background of One Belt and One Road” (一带一路背景下利比里亚林业发展状况及中利两国林业合作探析), *World Forestry Research*, 2018. Translation.

³³⁷ Gao Chao, Liberia: Huge Business Opportunities in Post-War Reconstruction (利比里亚:战后重建蕴藏巨大商机), *China's Foreign Trade*, 2009. Translation.

³³⁸ Wang Honghai, Liberia's National Security Situation and the Security Response Strategy of the Chinese Peacekeeping Police in Liberia (利比里亚国家安全形势现状与中国驻利维和警队安全应对策略), *Journal of Armed Policy Academy*, 2018. Translation.

Beijing frames its aid measures in Liberia as groundbreaking examples of commitment to the country, and Africa writ large, where the United States and West have failed.³³⁹ A Liberian academic echoes that line: “Whilst the United States continues to debate the merits of aid to Liberia, China will continue to fill a major gap in several areas of interventions,” wrote Dr. Josephus Moses Gbala-hinnih Gray, a professor at the University of Liberia in 2018. He argues that Liberia’s government should seek out closer ties with Chinese banks, companies, and government.³⁴⁰ But such messaging belies the empirics. China’s aid to Liberia remains dwarfed by that of the United States. Congress appropriated \$5 billion in post-war aid and assistance to halt the Ebola outbreak³⁴¹ and funded over a quarter of the UN peacekeeping operation in Liberia. The Armed Forces of Liberia were formed through almost \$250 million in aid from the United States.³⁴²

³³⁹ See “Effect of US, China Engagement in Africa and Impact of Foreign Aid,” *Belt and Road News*, December 3, 2019.

³⁴⁰ Josephus Moses Gbala-hinnih Gray, “Liberia: The New Era of China-Liberia Relations - a Story of Friendship and Win-Win Cooperation.” *All Africa*, August 7, 2018.

³⁴¹ Beijing’s aid to Africa for Ebola control efforts – distributed primarily across Guinea, Guinea Bissau, Liberia, and Sierra Leone – between 2014 and 2015 totaled approximately \$120 million. (Meibo Huang et al., “China’s Aid to Africa’s Fight Against Ebola.” *South-South Cooperation and Chinese Foreign Aid*, December 7, 2018.)

³⁴² Cook, Nicolas, “Liberia: Political Transition and U.S. Relations,” *Current Politics and Economics of Africa* 11, 4 (2018): 325-356.

Implications and Recommendations

China's influence in Africa can be translated into corresponding global influence, with security and economic implications for the United States.

First, in resources: Influence over Africa's consolidated resource supplies grants influence over international supply. The resources in question include energy and mineral resources. Many of those minerals are critical inputs for emerging industry and have limited global supply.³⁴³

Second, in industry and markets: Influence over and footholds in Africa's industrial development may allow Beijing to retain dominance in low-cost global manufacturing even as prices in China rise. The CCP exports its companies and infrastructure systems to Africa. As Beijing invests in Africa's resources, it also invests in the "upstream and downstream"³⁴⁴ industries built around them, namely processing, manufacturing, and transportation, creating integrated and insulated industrial chains comprised of Chinese players. The export of Chinese standards may help to cement China's industrial systems in Africa. Moreover, China uses "localization" of companies in countries in Africa to benefit from preferential trade relationships between those countries and the developed world.

Third, in emerging standards: Given Africa's scale and pace of growth, choices of standards on the continent are likely to affect the direction of its development. This is especially true of virtual systems (e.g., telecommunications, financial technology).

Fourth, in military-relevant information infrastructure, China's information networks across Africa, built in large part by military-civil fusion actors, could foster information asymmetry and enable the PLA to project power in the region, while challenging U.S. efforts.

Finally, China is likely to accelerate its investment and positioning in Africa in response to COVID-19. China consistently deepens its position on the continent during times of global financial and geopolitical crisis.³⁴⁵ Hints of such moves were evident in a Sino-African summit on

³⁴³ As Zou Lixing of the China Development Bank writes, "the major economies increasingly depend on energy and resources from Africa – not just for traditional oil and gas, but also for imports of strategic resources." (Zou Lixing, "The Emerging China-Africa Energy Cooperation" (新兴中的中非能源合作), *International Finance*, 2016. Translation.)

³⁴⁴ "Commerce and trade enterprises," reads a report funded by a Zhejiang Province project on China-Africa Collaborative Innovation, "can take advantage of the 'Going Out' of Chinese manufacturing to form vertical strategic alliances between different industries in the upstream and downstream of the industrial chain. Core manufacturing enterprises go abroad, form overseas supply chain alliances, and develop distribution channels." (Gao Lianhe, "Zhejiang Small and Medium-Sized Enterprises 'Cluster' Innovative Research on Non-Investment and Financing Models" (浙江中小企业 '集群式' 对非投融资模式创新研究), *African Studies*, 2016. Translation)

³⁴⁵ Yao Guimei explains as much: Describing times of crisis, he writes that "for Chinese government and commercial actors committed to investing in Africa, opportunities outweigh risks. This is because, first, the decrease in demand for African exports from developed countries causes the price of African products in the international market to fall sharply...there is an opportunity to produce high-quality company stocks at a lower cost; second, developed countries withdraw their investment in investment projects, prompting African countries to turn to China; third, the resources and markets of African countries are still of great significance to the sustainable development of China's future economy, so long-term strategic investments can be made...If Chinese companies can actively intervene when African countries are in trouble and expand the scope and scale of cooperation, when the global economy rebounds, Chinese companies will receive generous returns. (Yao Guimei, "New Challenges and Strategic Planning for Chinese

solidarity against COVID-19 chaired by Xi Jinping on June 17, 2020.³⁴⁶ They are also evident in a surge in Chinese global mine acquisitions in the second quarter of 2020 that has already led to Shandong Gold's agreement to purchase Australia's Cardinal Resources, which operates in Ghana. This activity is reminiscent of spikes after the 2008 financial crisis and global price slumps in 2015

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Recommendations

These implications prompt a series of recommendations for Congressional consideration. The primary areas for potential Congressional action include improving governmental understanding of China, repurposing existing tools for economic and security competition with China in Africa, developing new tools for economic and security competition with China in Africa, and implementing a comprehensive strategic approach to competing with China globally.

The CCP's competitive orientation toward the United States and ambition for promoting authoritarian norms and asymmetric competitive balances globally are increasingly apparent. The implications identified in this study suggest that Africa serves as a beach head and a testbed. The U.S. Congress has admirably accelerated its attention to China over the past several years. As U.S.-China strategic competition escalates, the United States government bears responsibility for understanding and responding to China's activities in a fashion that protects U.S. interests and those of allies, partners, and democratic norms globally.

Improving Understanding of China

- Current awareness of China's role in and influence over critical mineral supply chains remains inadequate. Congress should mandate identification and mapping of critical supply chains to assess China's influence over their inputs and U.S. vulnerabilities. This mapping should account for both direct and indirect Chinese investment. It should also account for trends in Chinese influence or policy that indicate emerging focus areas. Congressional oversight of Department of Defense programs like the Defense Logistics Agency's National Defense Stockpile may provide an avenue for increased awareness of these issues. Where vulnerabilities are identified, Congress should consider incorporating responsive measures into programs like the National Defense Stockpile and through public-private partnerships with related information gathering mandates.
- Intelligence and security monitoring ought to develop new and varied approaches to monitoring and assessing China's positioning that account for Beijing's military-civil fusion program and, with it, the military utility that can be redeemed from China's paramilitary and commercial positions in Africa and elsewhere. Congress could add explicit requirements for such information as a part of budget and force posture presentations to Congress by U.S. intelligence community, Department of Defense, military service branch, and unified combatant command leaders.

Investment in Africa" (中国在非洲投资的新挑战及战略筹划), *International Economic Cooperation*, 2015. Translation.)

³⁴⁶ "Xi to Chair Extraordinary China-Africa Summit on Solidarity Against COVID-19," *Xinhua*, June 16, 2020.

³⁴⁷ "David Erfle, Chinese Gold Miners Continue Junior Shopping SPress," *Kitco*, June 25, 2020.

Repurposing Existing Tools

- Chinese State-owned enterprises and State-backed, private firms “localize” their operations in order to avoid U.S. tariffs and non-tariff punitive tools deployed as a part of global, regional, and bilateral trade agreements. Congress should require the U.S. Trade Representative, bodies overseeing export controls, and other relevant authorities to update their enforcement processes to account for China’s regulatory circumvention. U.S. free trade agreements (FTAs) with African states should enhance scrutiny of foreign ownership and tighten rules of origin definitions to restrict the ability of Chinese actors to circumvent global trade commitments by “localizing” in Africa. Relevant terms and conditions vary across trade agreements and investment treaties; U.S. negotiators should optimize for a consistent ruleset that limits non-originating components that trace back to China’s non-market economy. Alternative dispute resolution mechanisms should be negotiated into individual FTAs to provide U.S. authorities modes of recourse quicker than those offered by the existing WTO system. Likewise, U.S. trade promotion activities on the African continent should encourage transparency around foreign corrupt practices, human rights abuses, and labor and environmental security. Where China contradicts its global trade or security obligations, the United States should work with multilateral bodies and partner countries to document and increase awareness of rule breaking.
- Foreign investment screening has proven to be a necessary tool for combatting China’s forced technology transfer and strategic acquisition of national security and dual-use technologies. However, recent reform of relevant tools stops short of addressing China’s broad range of mechanisms. The Sibanye-Stillwater merger cited in this report demonstrates the need for updated U.S. screening of foreign investments. The Sibanye-Stillwater merger saw U.S.-based Stillwater, the only active platinum and palladium mining operation in the United States at the time, acquired by Sibanye, a South African concern. Sibanye, despite its South African domicile, features a Chinese State-invested actor as a significant owner. The Sibanye-Stillwater merger increased CCP influence over a supply-constrained mineral resource. Investment review tools should be reformed by Congress to account for the corresponding threats and China’s indirect tack. China-linked capital investments and holdings in investment vehicles (e.g., as a limited partner [LP]) – rather than just stakes in operating companies – should be covered transactions. Foreign investment reviews should exhaustively vet ultimate beneficial ownership of investors gaining access to national security relevant technology, infrastructure, and data. And investment screening processes, including non-notified reviews, should be expanded to consider lower ownership share thresholds for CCP-backed investment into U.S.-based commodity extraction and processing fields.

Developing New Tools

- In Africa, Chinese actors aim to capture standard-setting and pricing powers in critical sectors. Chinese industrial planning in this vein is developed in an intricate public-private partnership that manifests in the “State-led, Enterprise-driven” model of industrial activity. The United States has no equivalent system. Beijing’s military-civil fusion program compounds this imbalance by building commercial gains into security advantage. Congress

should task relevant authorities, like the Department of Commerce's National Institute of Standards and Technology (NIST), with documenting the scope of China's standards strategy and forming a competitive analogue.

- Congress should similarly assess whether African countries' dependencies on China influence their autonomy, including their engagement in international organizations (e.g., the UN). Congress should task the Department of State with providing a report that assesses correlation between economic and commercial dependencies and autonomy. The report should advance a responsive, comprehensive international organizations strategy that prioritizes entities and outcomes, which could guide deliberate rule-setting and alliance development efforts in those bodies moving forward. This report should also document China's departures from obligations in international organizations like the UN (e.g., leveraging peacekeeping forces to protect national assets and investments near a peacekeeping mission site).
- China's engagement with countries in Africa is opaque and risks being predatory. Congress should work with the Department of State to identify, document, and bring transparency to China's malign influence and activity in Africa, China's corresponding information strategy, as well as the ground truth of China's ambition for engagement with specific African states. U.S. efforts should also convey an affirmative, values-based vision in Africa through U.S. information channels and those of like-minded allies and partners. Beijing threatens democratic norms and values, human rights, and economic prosperity on the African continent.

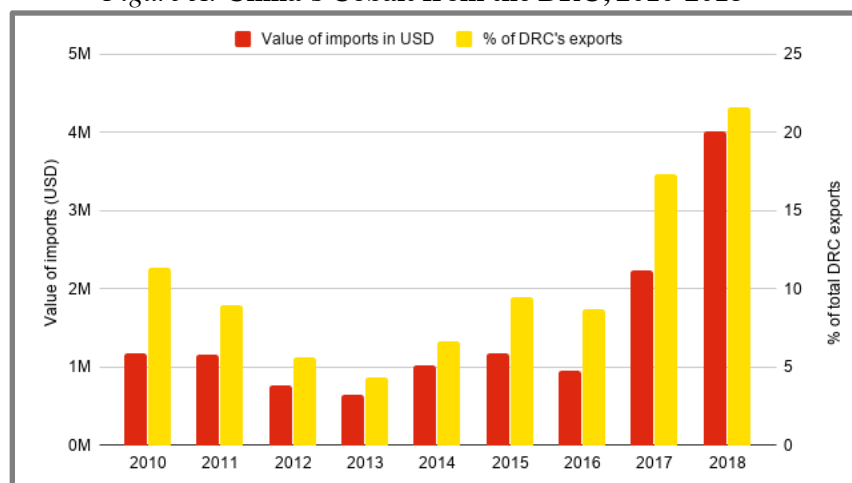
Developing a Responsive, Global Strategy

- At present, no U.S. government entity bridges divides between economic, security, and narrative elements of national power that China integrates. Congress should consider establishing a novel entity for carrying out such a mandate. It should be granted a superordinate bureaucratic position. It should be tasked with coordinating a whole-of-government approach to competition, diagnosing relative strengths and weaknesses, and implementing a strategy that builds on enduring U.S. strengths vis-à-vis China and protects against vulnerabilities like those exposed by China's dominance of critical points of supply in Africa.

Appendix A: Case Study: New Energy Vehicles, Cobalt, and the DRC

New energy vehicles are a priority of Chinese State programs ranging from Made in China 2025 to planning for China Standards 2035. Beijing’s industrial planning prioritizes the architecture for an Internet of Everything era.³⁴⁸ Connected vehicles will be critical nodes of that architecture. More immediately, new energy vehicles are a major, growing market ripe for the taking, without an incumbent. Their technology also has military applications.

Figure A: China’s Cobalt from the DRC, 2010-2018³⁴⁹



Most new energy vehicle batteries are cobalt-based lithium ion batteries.³⁵⁰ The DRC is the largest global producer of cobalt, accounting for approximately 60 percent of world totals.³⁵¹ Beijing has leveraged investment and loans – as well as government and private sector relationships and dependencies – to ensure access to that cobalt, its extraction, and its processing. In 2018, China accounted for approximately 86.5 percent of the DRC’s cobalt ore and concentrate exports, by value.³⁵²

Chinese companies own or invest in entities that own at least 12 of the DRC’s mines with cobalt reserves.³⁵³ All but one of those companies is State-owned.³⁵⁴ China’s first, big cobalt bet in the

³⁴⁸ The phrase “Internet of Everything” might be understood as the overarching concept covering the commercial and the industrial Internet of Things phenomena – as well as their social and strategic ramifications. (Chinese Academy of Sciences, *The Science and Technology Revolution and China's Modernization* (科技革命与中国的现代化), Beijing: 2009.)

³⁴⁹ “UN Comtrade: International Trade Statistics Database.” United Nations.

³⁵⁰ Jasper Jolly, “Cutting battery industry’s reliance on cobalt will be an uphill task,” *The Guardian*, January 5, 2020.

³⁵¹ Priscila Barrera, “Top Cobalt Production by Country,” *Investing News*, June 16, 2020.

³⁵² Imports and Exports: “UN Comtrade: International Trade Statistics Database.” United Nations. Beijing also invests in the lithium supply chain, as evident in China Minmetals’s recent partnerships with Mali Lithium. As a Mali Lithium representative put it in an interview in 2019, “Minmetals highlighted to us the importance of long-term access to sources of reliable, high-quality raw material in jurisdictions amenable to Chinese investment.” (“China Minmetals Expands Relationship with Mali Lithium,” *Mining Review*, September 4, 2019.)

³⁵³ Emily de La Bruyère, “Testimony before the US-China Economic and Security Review Commission: China’s Strategic Aims in Africa,” May 8, 2020.

³⁵⁴ The exception is Chengtun Mining, which holds an 85 percent stake in the Kalongwe copper-cobalt mine.

DRC came in 2007. That year, a consortium of Chinese firms, led by State-owned China Railway Group and financed by the China EXIM Bank, landed rights to the Sicomine copper-cobalt mine in Katanga, DRC.³⁵⁵ The agreement was initially valued at 9 billion USD.³⁵⁶ Through the deal, and the Chinese-owned production supported by it, China’s annual cobalt exports from the DRC rose from an annual value of 300 million USD to an annual value of over 1 billion USD by 2010. Exports decreased slightly thereafter but have risen sharply since 2017.

*Figure B: 2018 Cobalt Production, Processing, and Refining of Top African producers, China, and the United States*³⁵⁷

Country	2018 mine production (tons, metal content)	China's share of reported exports (%)	Production of refined copper (tons, metric)
DRC	109402	86.5	68
South Africa	1007	41.4	1007
Morocco	1806	-	1806
Zambia	1585	62.7	1663
Madagascar	2655	16.8	2850
China	9000	-	78360 ³⁵⁸
US	-	8	-
World	168000	-	125833

Chinese companies also invest in the processing of that cobalt, and in integrated supply chains. The cobalt hydroxide produced at Jinchuan Group’s Ruashi mine is sold to Jinchuan and its affiliates.³⁵⁹ Jinchuan’s Kinsenda mine is integrated with a processing plant.³⁶⁰ Jinchuan Group sells the oxide ore produced at its Musonoi copper cobalt mine to a smelter built and operated by Chengtun Mining.³⁶¹ CNMC has established leach plants and smelters, as well as a mineral research and development center in the DRC.³⁶²

³⁵⁵ Aaron Ross, “China’s Infrastructure for Minerals Deal Gets Reality-Check in Congo,” July 9, 2015.

³⁵⁶ It was later scaled down to \$6 billion USD. (“The Deal for Deziwa,” *Global Witness*, August 2020.)

³⁵⁷ Figures for cobalt refining are based on in-country performance. They do not take into account processing and refining at China-operated or China-owned facilities in African, or other foreign countries. As a result, they may underestimate China’s total influence over those nodes in the supply chain. Mine production, and refined cobalt production data is collected from the British Geological Service’s World Mineral Statistics Database. Trade data is collected from UN Comtrade: International Trade Statistics Database, with cobalt defined as “cobalt ores and concentrates” as well as “cobalt: mattes and other intermediate products of cobalt metallurgy, cobalt and articles thereof.” Trade flows are based on reporting by the importing countries. Export share is assessed by value. Methodology is inspired by Susan van den Brink et al., “Identifying Supply Risks by Mapping the Cobalt Supply Chain,” *Resources, Conservation, and Recycling*, May 2020.

³⁵⁸ Some of China’s refined cobalt production is recorded in Belgium, which produced 6,360 tons in 2018.

³⁵⁹ Jinchuan Group, “Proposed Revised Annual Caps for Continuing Connected Transactions,” May 6, 2019. That company report further notes that “it is for strategic reason JCG enters into cobalt agreements with the Group to ensure its access to the cobalt. JCG Group has been the only offtaker of cobalt metals from the Ruashi mine since it commenced commercial operation in 2009...” (Ibid)

³⁶⁰ “Kinsenda Project,” Metorex, www.metorexgroup.com

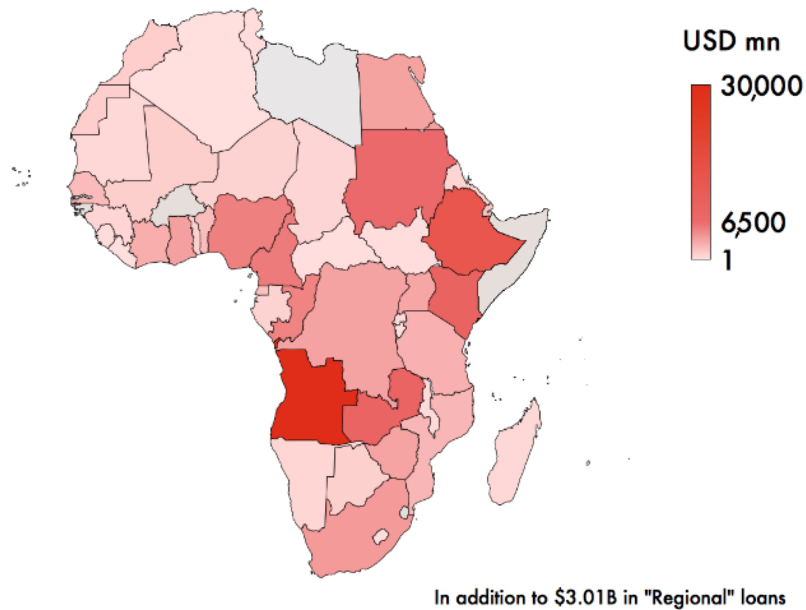
³⁶¹ State-owned Assets Supervision and Administration Commission of the State Council, “CNMC Backs Digital Upgrading of Mining industry in Zambia,” August 29, 2018.

³⁶² Collected from CNMC website press releases and various Chinese media sources.

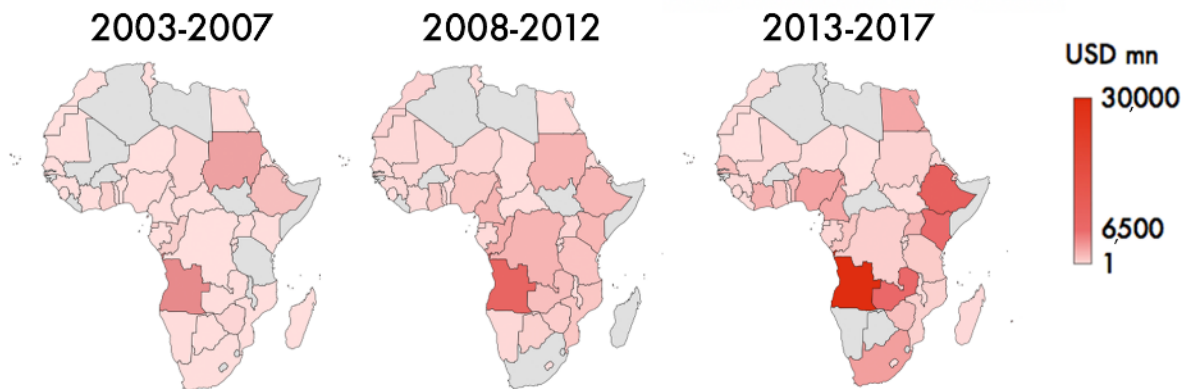
Appendix B: Supplement to “Chapter 1: Tools and Mechanisms”

Appendix B.1: Chinese Investment and Lending in Africa

*Figure: All Chinese Loans in Africa, 2000-present*³⁶³



*Table: All Chinese Loans in Africa, 2003-2017*³⁶⁴



³⁶³ Deborah Brautigam, et al., “Chinese Loans to Africa Database.” Washington, DC: China Africa Research Initiative, Johns Hopkins University School of Advanced International Studies. Published March 2020. Accessed June 10, 2020. <http://www.sais-cari.org/data>.

³⁶⁴ In addition to \$92 million USD 2003-2007; \$228 million USD 2008-2012; \$2.69 billion USD 2013-2017. (Deborah Brautigam et al., “Chinese Loans to Africa Database.” Washington, DC: China Africa Research Initiative, Johns Hopkins University School of Advanced International Studies. Published March 2020.)

Figure: Cumulative China-Africa FDI Flows, 2009-2018³⁶⁵

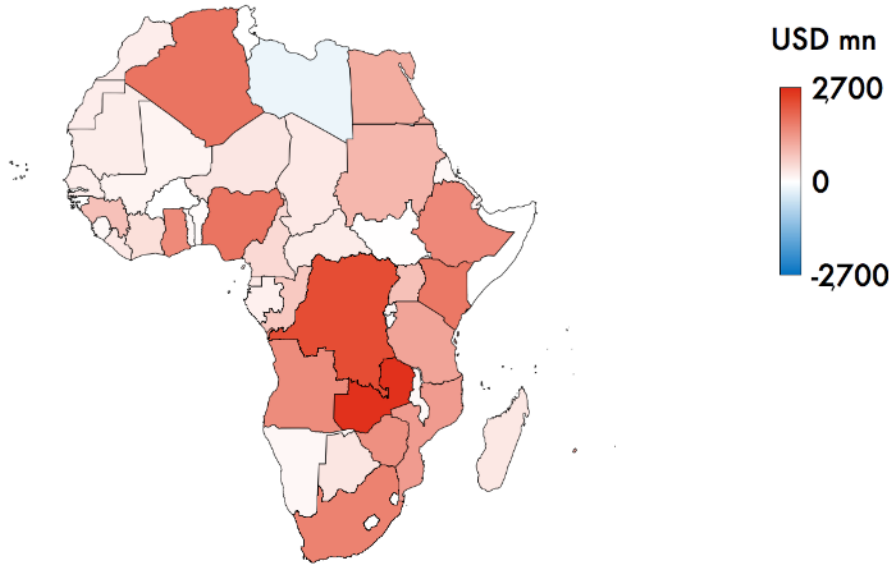
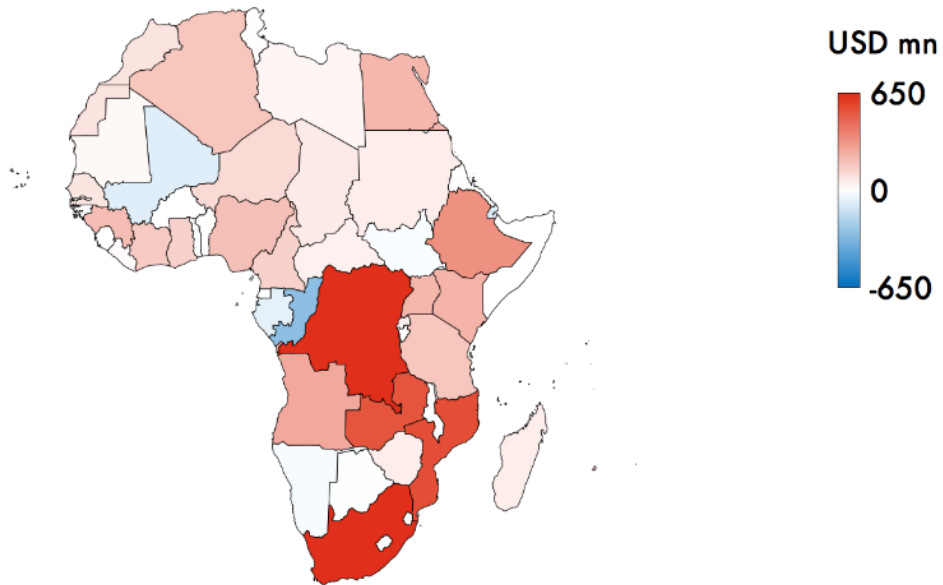


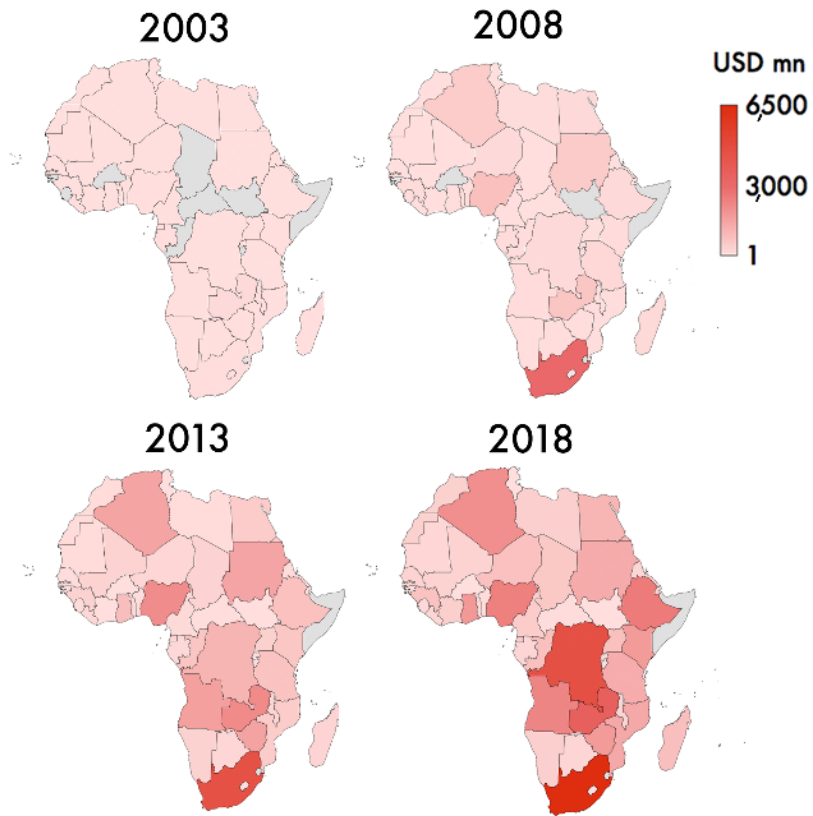
Figure: China-Africa FDI Flows, 2018³⁶⁶



³⁶⁵ “Chinese FDI Flow to African Countries.” Washington, DC: China Africa Research Initiative, Johns Hopkins University School of Advanced International Studies. Updated February 2020..

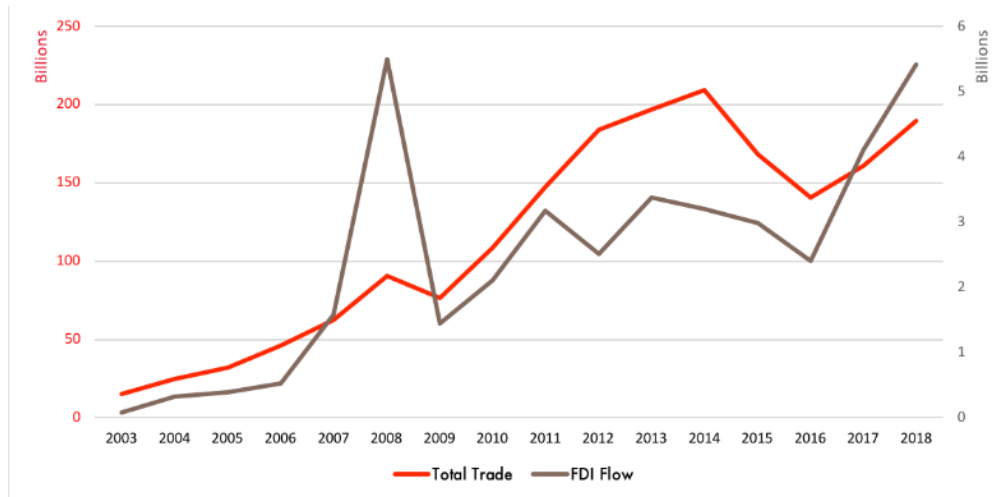
³⁶⁶ “Chinese FDI Flow to African Countries.” Washington, DC: China Africa Research Initiative, Johns Hopkins University School of Advanced International Studies. Updated February 2020..

Figure: China-Africa FDI Stock, 2003-2018 (USD mn)³⁶⁷



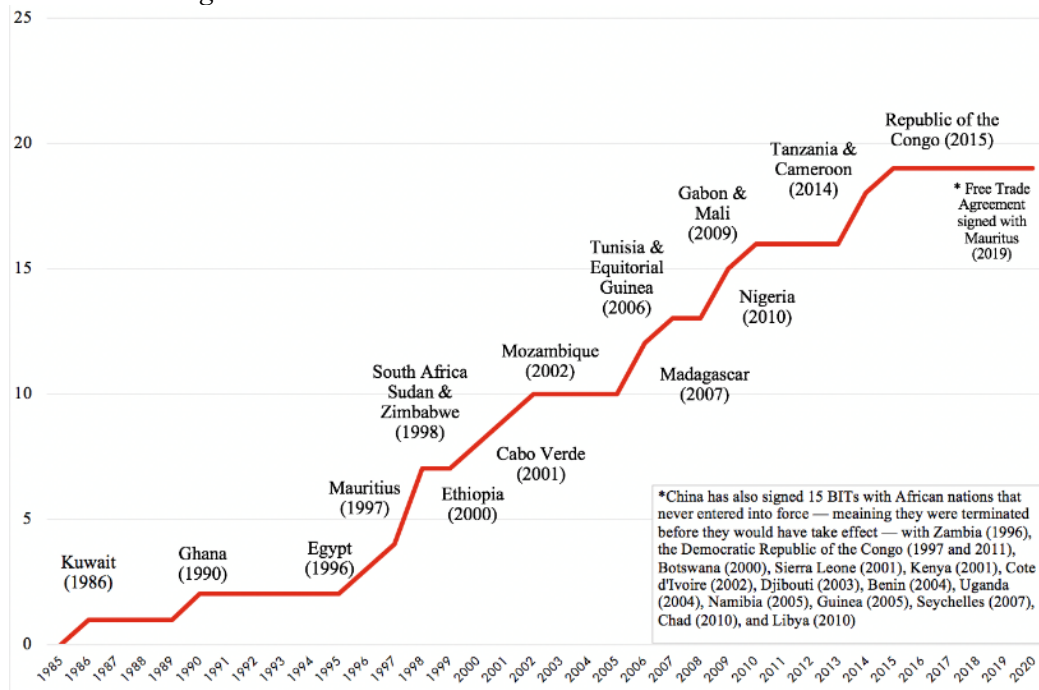
³⁶⁷ “Chinese FDI Stock in African Countries.” Washington, DC: China Africa Research Initiative, Johns Hopkins University School of Advanced International Studies. Updated February 2020.

Figure: China-Africa FDI and Trade, 2003-2018³⁶⁸



Appendix B.2: China’s Trade with Africa

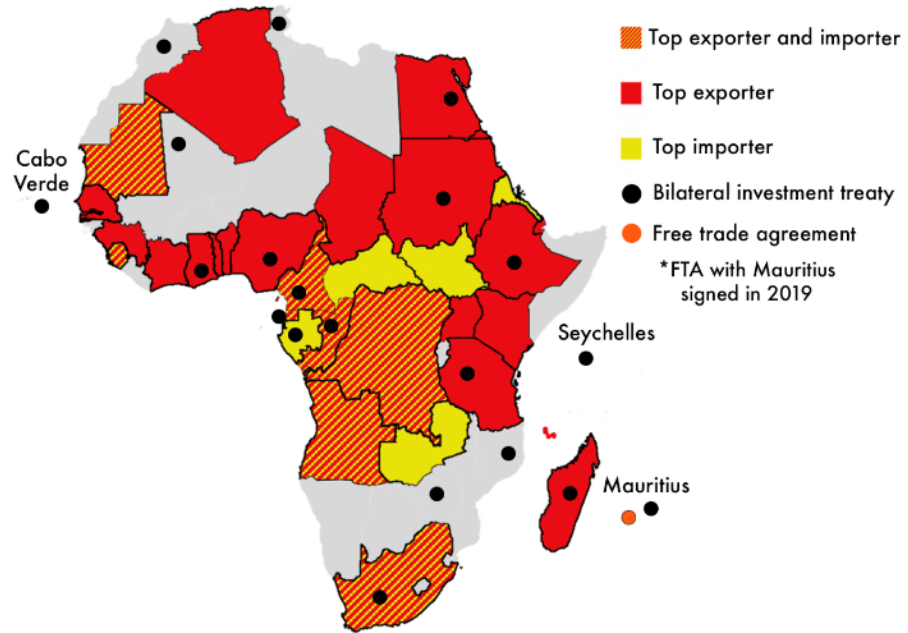
Figure: China’s Bilateral Investment Treaties in Africa³⁶⁹



³⁶⁸ “Chinese FDI Flow to African Countries.” Washington, DC: China Africa Research Initiative, Johns Hopkins University School of Advanced International Studies. Updated February 2020; “UN Comtrade: International Trade Statistics Database.” United Nations.

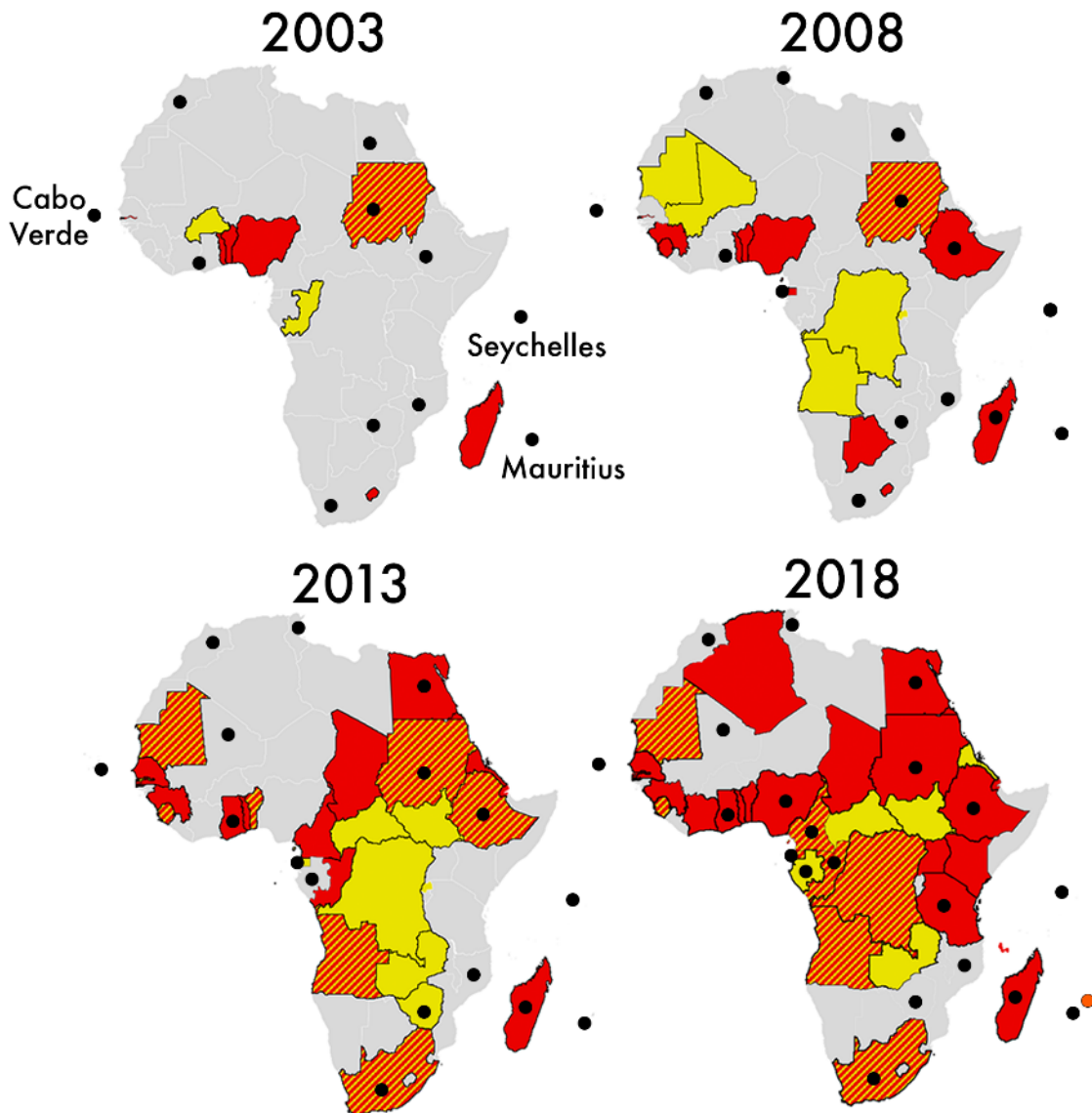
³⁶⁹ “Investment Policy Hub.” UNCTAD. United Nations Conference on Trade and Development.

Figure: China as a Top Trade Partner, FTA, and Bilateral Investment Treaties³⁷⁰








³⁷⁰ Trade figures drawn from 2018 data. “UN Comtrade: International Trade Statistics Database.” United Nations; “China FTA Network.” Chinese Ministry of Foreign Affairs; “Investment Policy Hub.” UNCTAD. United Nations Conference on Trade and Development.

Figure: China as a Top Trade Partner, FTA, and Bilateral Investment Treaties, 2003-2018³⁷¹



* FTA with Mauritius signed in 2019

Map Legend					
	Top exporter and importer		Top exporter		Top importer
	Bilateral investment treaty		Free trade agreement*		

³⁷¹ “UN Comtrade: International Trade Statistics Database.” United Nations; “China FTA Network.” Chinese Ministry of Foreign Affairs; “Investment Policy Hub.” UNCTAD. United Nations Conference on Trade and Development.

Figure: Distribution of China's Imports from South Africa, 2018³⁷²

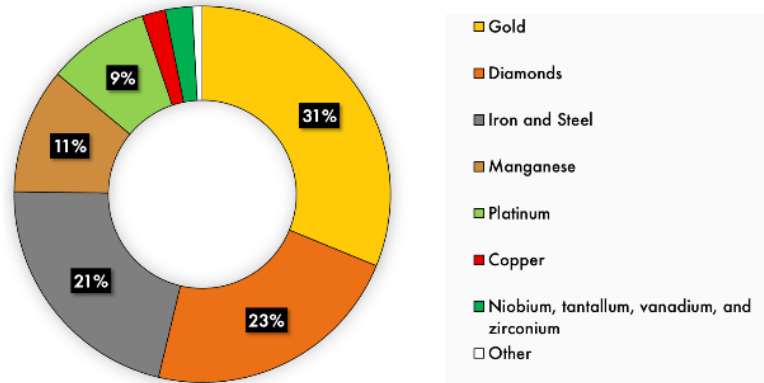


Figure: Distribution of China's Imports from DRC, 2018³⁷³

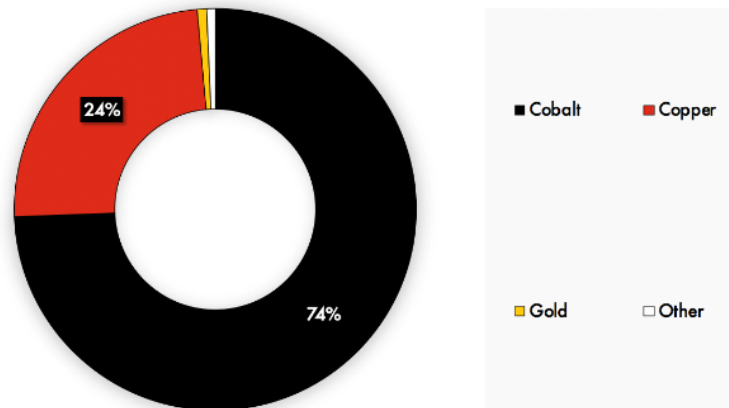
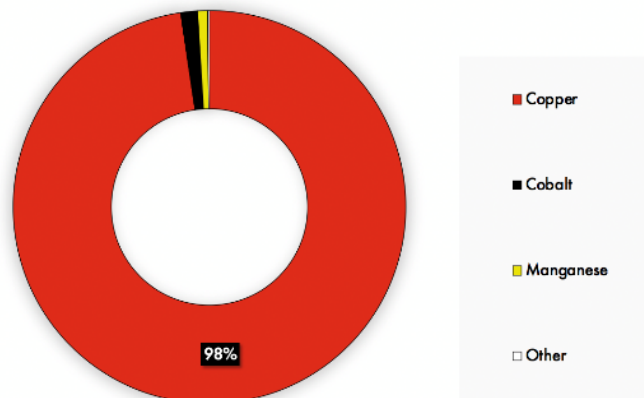


Figure: Distribution of China's Imports from Zambia, 2018³⁷⁴

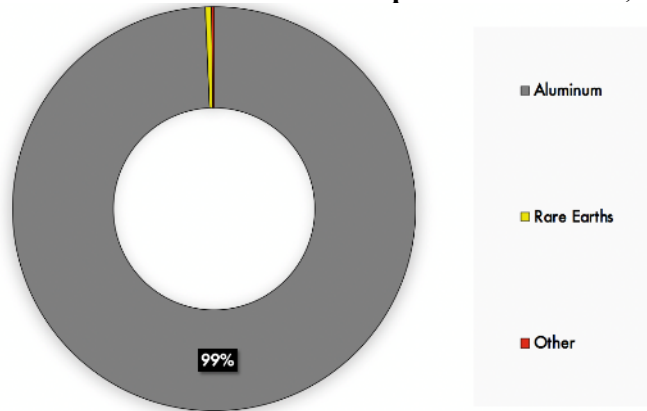


³⁷² “UN Comtrade: International Trade Statistics Database.” United Nations.

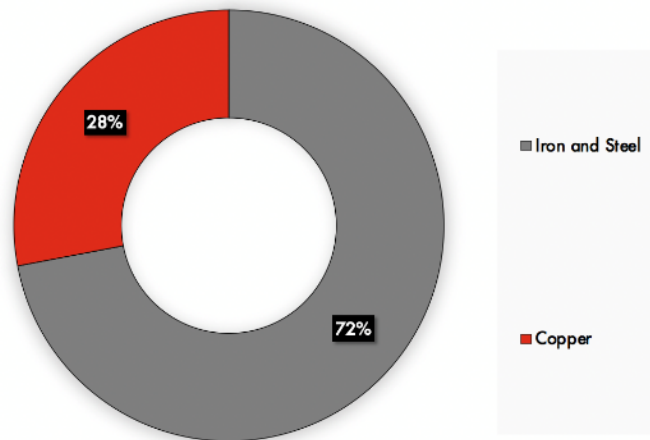
³⁷³ “UN Comtrade: International Trade Statistics Database.” United Nations.

³⁷⁴ “UN Comtrade: International Trade Statistics Database.” United Nations.

*Figure: Distribution of China's Imports from Guinea, 2018*³⁷⁵



*Figure: Distribution of China's Imports from Mauritania, 2018*³⁷⁶

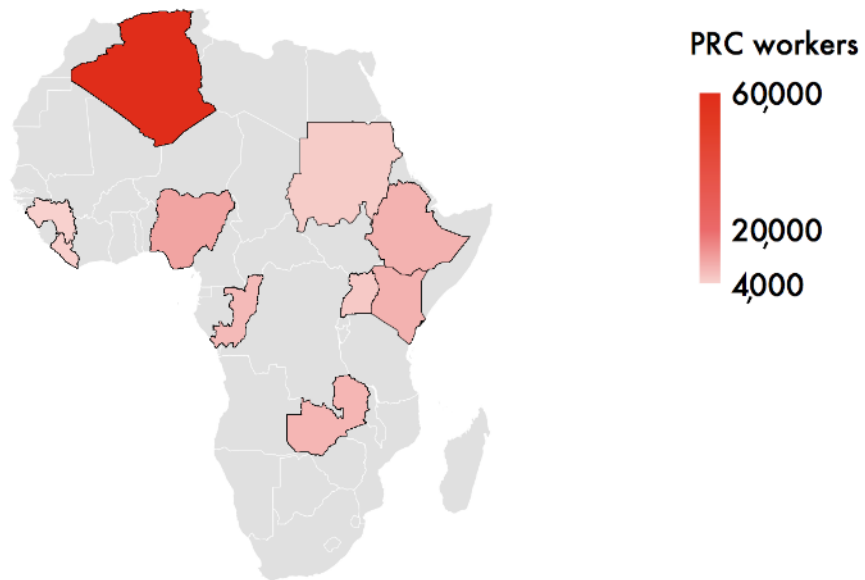


³⁷⁵ “UN Comtrade: International Trade Statistics Database.” United Nations.

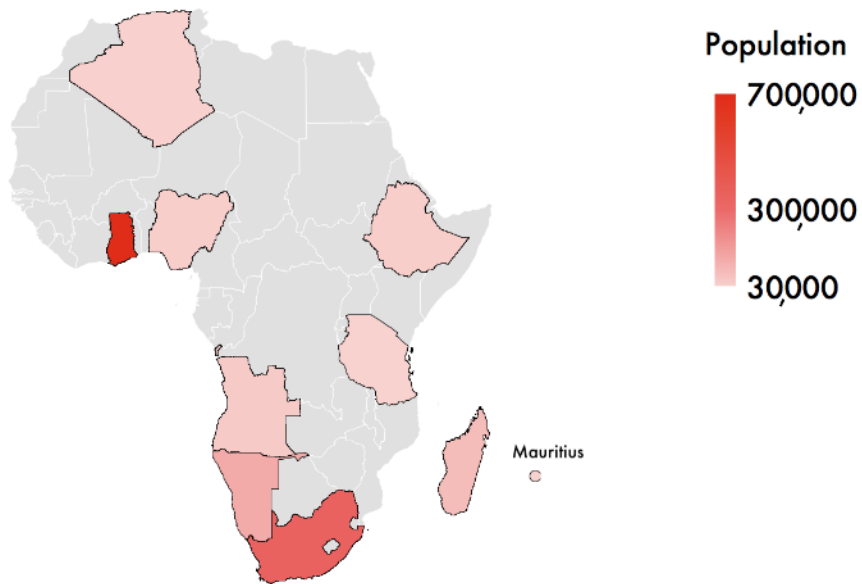
³⁷⁶ “UN Comtrade: International Trade Statistics Database.” United Nations.

Appendix B.3: Chinese Labor in Africa

*Figure: Top Ten Destinations for Chinese Workers in Africa, 2018*³⁷⁷



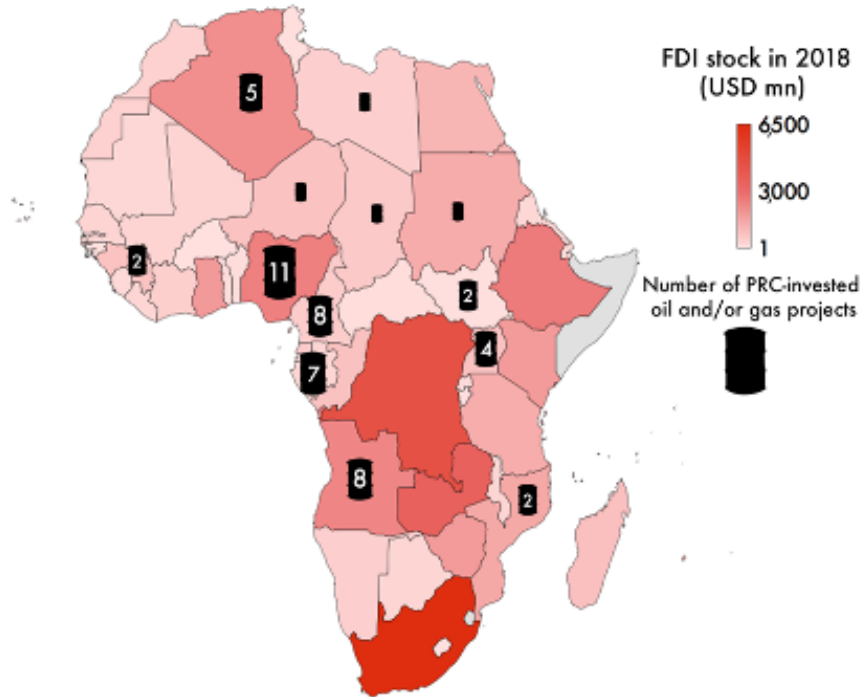
*Figure: Top Ten Destinations for Chinese Overseas Population in Africa, 2018*³⁷⁸



³⁷⁷ “Chinese Africa Labor Data.” Washington, DC: China Africa Research Initiative, Johns Hopkins University School of Advanced International Studies.

³⁷⁸ “Chinese Africa Labor Data.” Washington, DC: China Africa Research Initiative, Johns Hopkins University School of Advanced International Studies.

*Figure: China’s FDI and Oil & Gas Projects in Africa*³⁷⁹



³⁷⁹ This aggregation focuses on active operations in which Chinese actors hold equity stakes; the aggregation excludes projects that have been announced but for which documentation of operations could not be verified, offtake agreements, or projects that are focused on downstream refining, processing, and distribution. Oil and gas project data aggregated from AidData, Business Monitor International. FDI data from “Chinese FDI Flow to African Countries.” Washington, DC: China Africa Research Initiative, Johns Hopkins University School of Advanced International Studies. Updated February, FDI data is drawn from 2018 figures. Chinese FDI Stock in African Countries,” China Africa Research Initiative, Johns Hopkins University School of Advanced International Studies.

Appendix C: Supplement to “Chapter 3: Agriculture: Footholds in a Developing Market”

*Table: China’s International Agricultural Development Zones in Africa*³⁸⁰

Name	Focus areas
Mozambique-China Agricultural Technology Demonstration Center	Cultivation and processing of rice, corn, and other food crops
Tanzania-China Xinyanga Agriculture, Industry and Trade Modern Industrial Park	Development of complete industrial chain in cotton planting, cotton seed processing, spinning, and weaving; agricultural machinery production; breeding of catalpa oil, cotton cake feed and other projects
Uganda-China Agricultural Cooperative Industrial Park	Rice, corn, millet; beef cattle and poultry; rice, cassava, feed, and beef processing; warehousing and logistics
Zambia-China Agricultural Products Processing Cooperation Park	Cotton breeding, planting, acquisition, processing, warehousing, logistics, etc.
Sudan-China Agricultural Cooperative Development Zone	Cotton, alfalfa, agricultural machinery and equipment, pesticides and chemical fertilizers

³⁸⁰ China Council for the Promotion of International Trade, “The First Batch of Overseas Agricultural Cooperation Demonstration Zones” (首批境外农业合作示范区), November 15, 2018. Translation.

Appendix D: Supplement to “Chapter 4: Industrial Capacity Cooperation

*Table: China’s Industrial Cooperation Parks in Africa*³⁸¹

Country	Name
Algeria	China Jiangling Economic and Trade Cooperation Zone
Egypt	Egypt Suez Economic and Trade Cooperation Zone
Egypt	China Egypt Mankai Textile Industrial Park
Ethiopia	Adama Light Industrial Park, Ethiopia
Ethiopia	Hawassa Industrial Park, Ethiopia
Ethiopia	Ethiopian Dire Dawa Light Industrial Park
Ethiopia	Ethiopian Oriental Industrial Park
Ethiopia	Ethiopia-Hunan Industrial Park
Ethiopia	Klintu Industrial Park, Ethiopia
Ethiopia	Ethiopian Kombolcha Light Industrial Park
Ethiopia	Ethiopia China Communications Industrial Park (China Communications Ethiopia ARERTI Industrial Park)
Ethiopia	Huajian Ethiopia Light Industry City
Ethiopia	China-Africa Modern Animal Husbandry Circular Economy Industrial Zone
Djibouti	Djibouti International Free Trade Zone
Zimbabwe	Huajin Mining Economic and Trade Park
Zimbabwe	China-Tianjin Economic and Trade Cooperation Zone
Kenya	Kenya Pearl River Special Economic Zone
Kenya	China-Kenya (East Africa) Economic and Trade Cooperation Zone
Mauritius	Mauritius Jin-Africa Economic and Trade Cooperation Zone
Mauritania	China-Mao (Hongdong) Marine Economic Cooperation Park
Mozambique	Mozambique's Beira Economic and Trade Cooperation Zone
Mozambique	Mozambique Wanbao Industrial Park
Mozambique	Mozambique-China Agricultural Technology Demonstration Center
South Africa	Hisense South Africa Cape Town Atlantis Industrial Park
Nigeria	Nigeria Guangdong Economic and Trade Cooperation Zone
Nigeria	Huihong Development Zone, Calabar, Nigeria
Nigeria	Nigerian Lekki Free Trade Zone
Nigeria	Ningbo Industrial Park, Nigeria

³⁸¹ Wu Mingquan et al., Information Dataset of China’s Overseas Industrial Parks (中国境外产业园区信息数据集), *Science Data Bank*, 2019. Translation.

Nigeria	Yuemei Nigeria Textile Industrial Park
Sierra Leone	Sierra Leone Guoji Industry and Trade Park
Sierra Leone	Sierra Leone Agricultural Industrial Park
Sudan	Sino-Soviet Agricultural Development Zone
Tanzania	Jiangsu-Xinyangga Agriculture, Industry and Trade Modern Industrial Park
Tanzania	Special Economic Zone in Bagamoyo, Tanzania
Tanzania	Zhongtan Modern Agricultural Industrial Park
Uganda	Africa (Uganda) Shandong Industrial Park
Uganda	Liaoshen Industrial Park, Uganda
Uganda	Uganda-China Agricultural Cooperative Industrial Park
Uganda	Central Umbala Industrial Park
Zambia	Zambia Agricultural Products Processing Cooperation Park (Chipata Park)
Zambia	Zambia Agricultural Products Processing Cooperation Park (Petauke Park)
Zambia	Zambia-China Economic and Trade Cooperation Zone (Lusaka Park)
Zambia	Zambia-China Economic and Trade Cooperation Zone (Chambishi Park)
Zambia	Zambia Zhongken African Agricultural Industrial Park
Zambia	Sinoma Zambia Building Materials Industrial Park

Appendix E: Supplement to “Chapter 5: Infrastructure and Standards”

Figure: Chinese-invested Rail Projects and FDI³⁸²

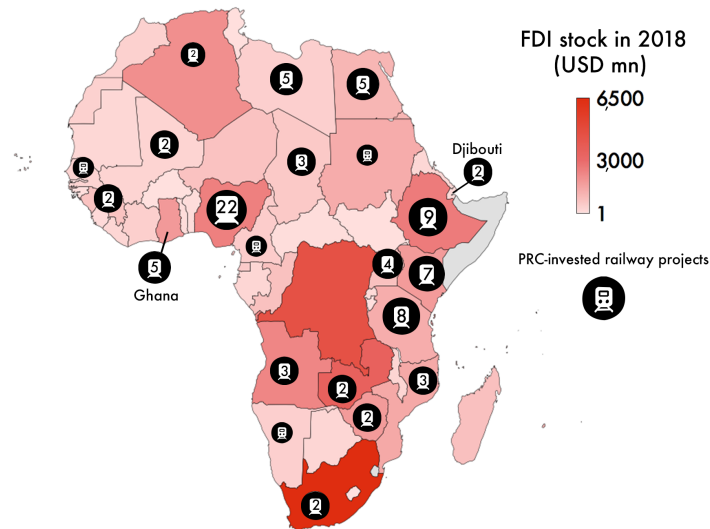
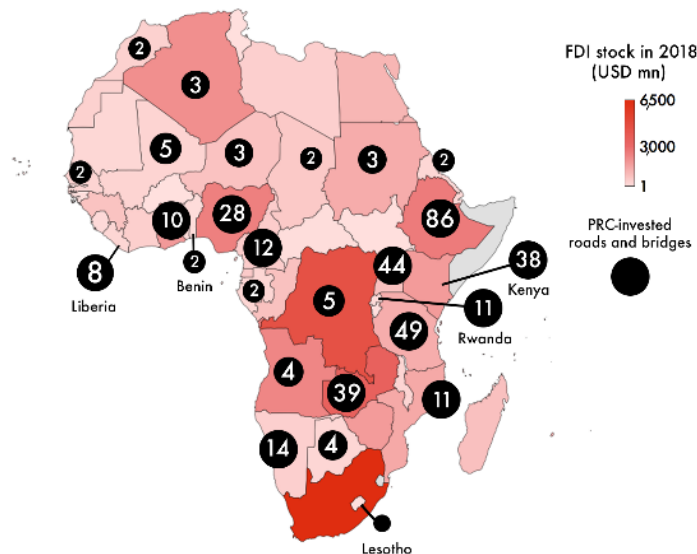


Figure: Chinese-invested Road and Bridge Projects and FDI³⁸³

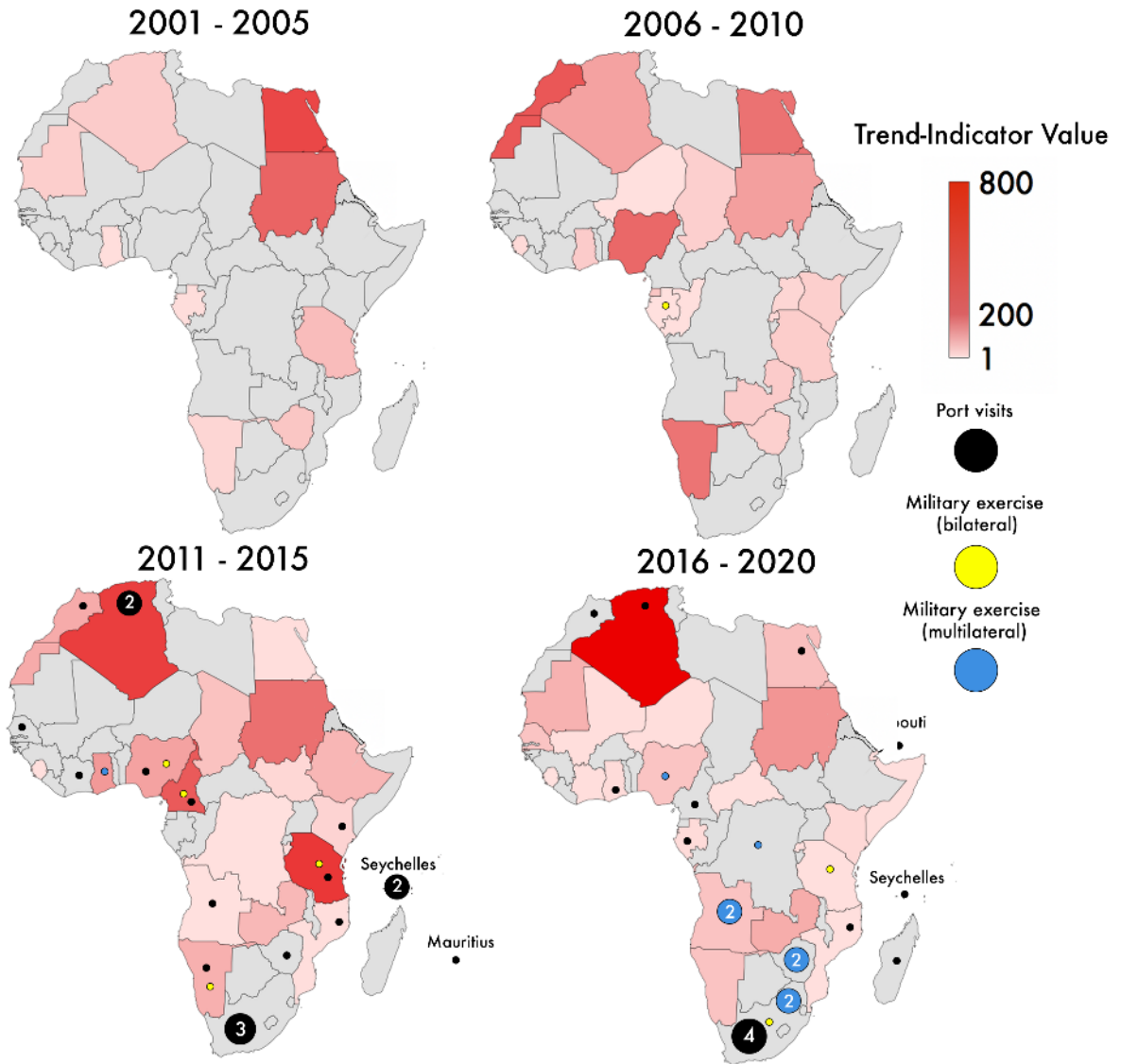


³⁸² Infrastructure project data is aggregated from a range of sources including the Economist Intelligence Unit, Business Monitor International, CEIC, and reporting and analysis from international institutions including the World Bank and International Monetary Fund. Company data is sourced from company public disclosures and financial records, press releases, and scrutiny of official entity ownership registrars in China and internationally. FDI data is drawn from 2018 figures. Chinese FDI Stock in African Countries,” China Africa Research Initiative, Johns Hopkins University School of Advanced International Studies.

³⁸³ Infrastructure project data is aggregated from a range of sources including the Economist Intelligence Unit, Business Monitor International, CEIC, and reporting and analysis from international institutions including the World Bank and International Monetary Fund. Company data is sourced from company public disclosures and financial records, press releases, and scrutiny of official entity ownership registrars in China and internationally. FDI data is drawn from 2018 figures. Chinese FDI Stock in African Countries,” China Africa Research Initiative, Johns Hopkins University School of Advanced International Studies.

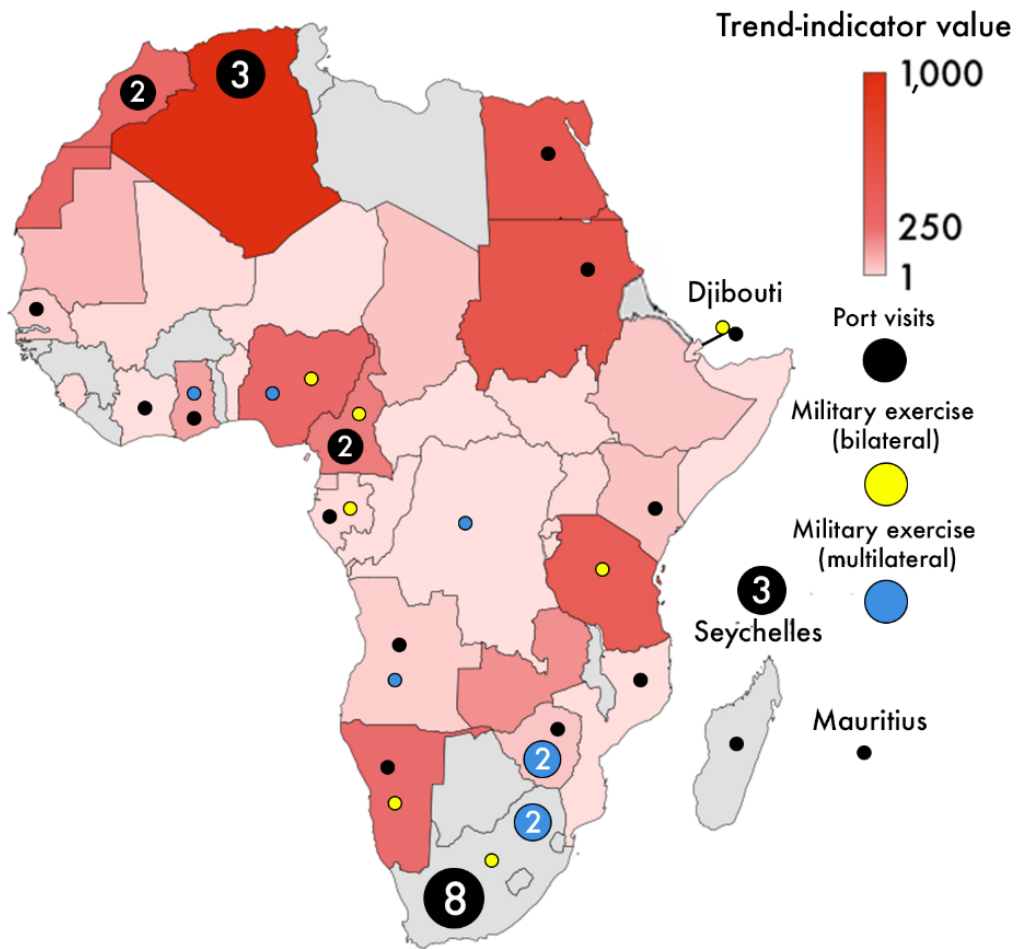
Appendix F: Supplement to “Chapter 6: Security Cooperation”

*Figure: Chinese Arms Transfers to Africa & Military Exercises (over time)*³⁸⁴



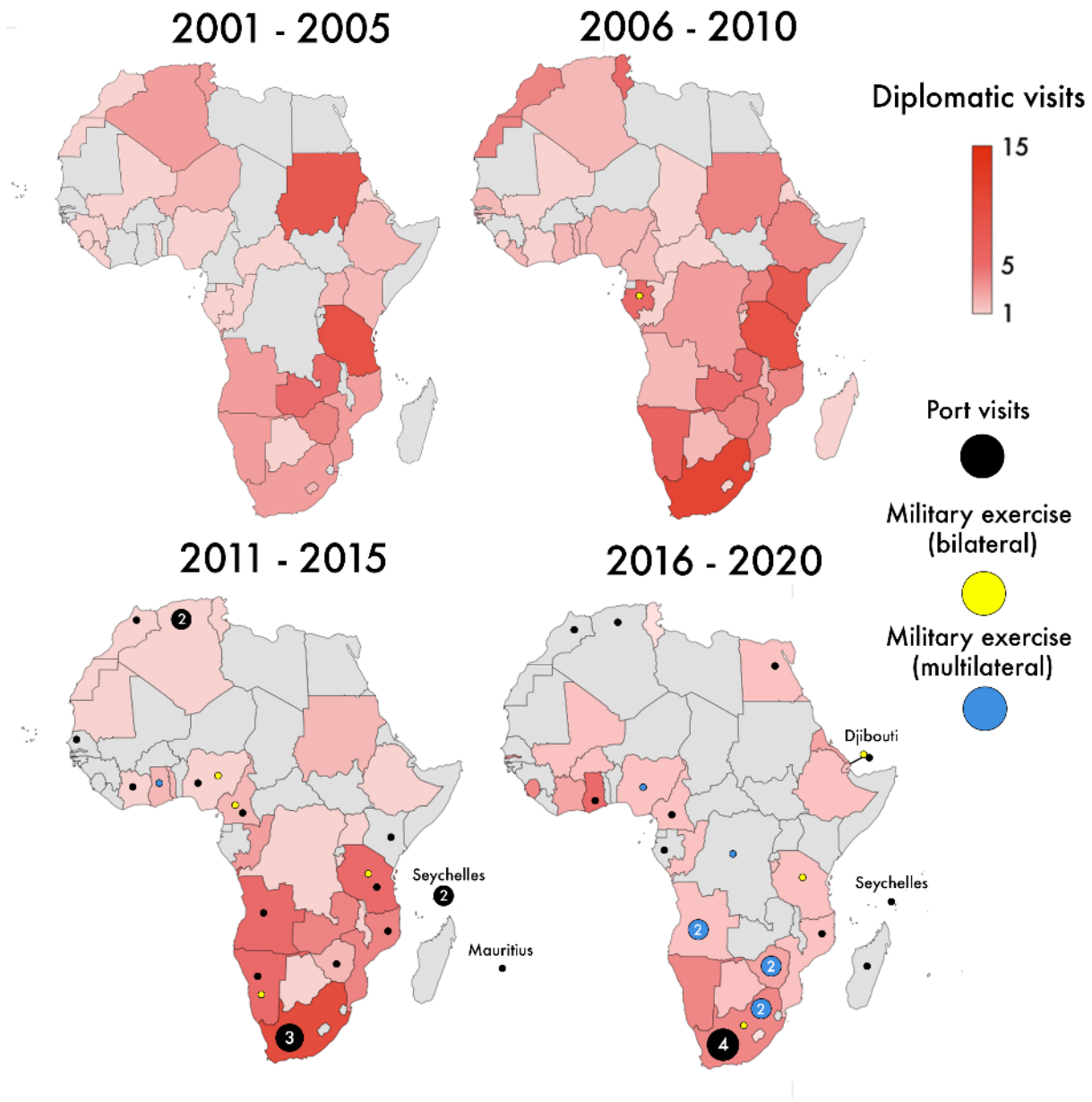
³⁸⁴ “SIPRI Arms Transfers Database.” SIPRI. Stockholm International Peace Research Institute; “China Military.” Chinese People’s Liberation Army.

Figure: Chinese Arms Transfers to Africa & Military Exercises, 2000-present³⁸⁵



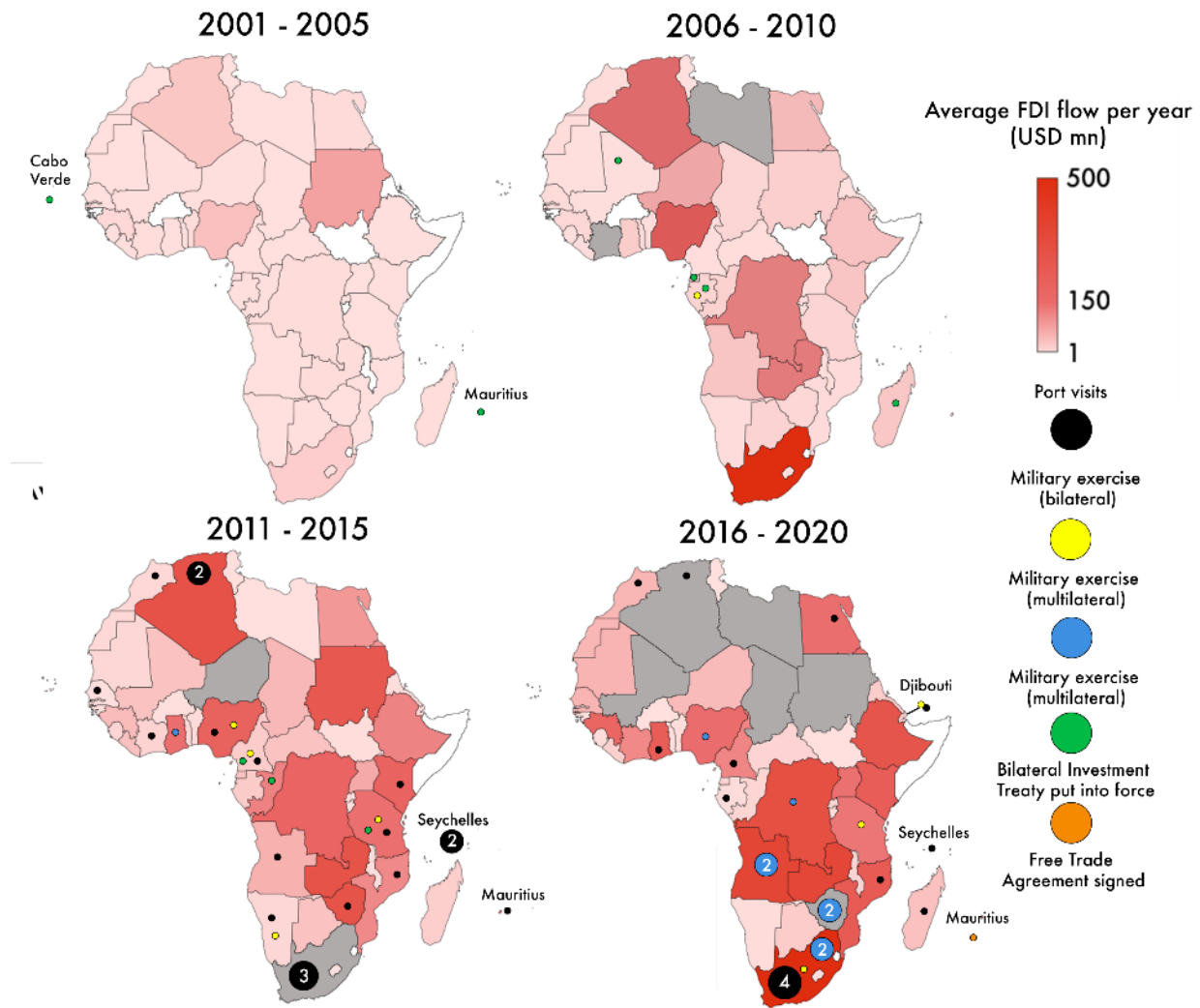
³⁸⁵ “SIPRI Arms Transfers Database.” SIPRI. Stockholm International Peace Research Institute; “China Military.” Chinese People’s Liberation Army.

Figure: Chinese Diplomatic Activities & Military Exercises³⁸⁶



³⁸⁶ “China Military.” Chinese People’s Liberation Army; “Diplomatic Agenda.” Ministry of Foreign Affairs of the People’s Republic of China.

Figure: Average FDI Flows, Military Exercises, and Bilateral Investment Treaties³⁸⁷



³⁸⁷ FDI data unavailable for 2001, 2002, 2019, 2020. Gray shading indicates negative average FDI flow. Data sourced from “Chinese FDI Flow to African Countries.” Washington, DC: China Africa Research Initiative, Johns Hopkins University School of Advanced International Studies. Updated February 2020; “Diplomatic Agenda.” Ministry of Foreign Affairs of the People’s Republic of China.

*Figure: China's Peacekeeping Operations (PKO) Troops in Africa by Country, 1991-2020*³⁸⁸

Mission	Country	Years Present	Number	China's % share of trade, final year of PKO	China's % share of trade, 2018
ONUMOZ	Mozambique	1992-1994	10	4*	13
UNOMIL	Liberia	1993-1997	10	3*	23
UNOMSIL	Sierra Leone	1998-1999	6	5*	25
UNAMSIL	Sierra Leone	1999-2005	6	5	25
MONUC	Democratic Congo	1999-2010	234	31	41
UNMEE	Ethiopia	2000-2008	5	17	29
	Eritrea			11	37
UNMIL	Liberia	2003-2018	598	23	23
UNOCI	Ivory Coast	2004-2017	6	10	8
UNMIS	Sudan	2005-2011	418	11	22
MINUSCA	Central African Republic	Ongoing	2		24
MINURSO	Western Sahara	Ongoing	9	N/A	N/A
MONUSCO	Democratic Congo	Ongoing	226		41
UNAMID	Sudan	Ongoing	370		22
MINUSMA	Mali	Ongoing	426		7
UNMISS	South Sudan	Ongoing	1076		66

³⁸⁸ Stars indicate missions for which 2000 trade data was used for the final year of the peacekeeping operation. "Troop and Police Contributors." United Nations Peacekeeping. United Nations; "List of Past Peacekeeping Operations" United Nations Peacekeeping. United Nations; "Countries;" Observatory of Economic Complexity.