



The development impact of Chinese development investments in Africa

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About this report

The K4D Emerging Issues report series highlights research and emerging evidence to policy-makers to help inform policies that are more resilient to the future. K4D staff researchers work with thematic experts and DFID to identify where new or emerging research can inform and influence policy.

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1. Overview

This Emerging Issues report examines a number of popular narratives about the impacts of Chinese investment on economic development in Africa. Popular narratives include Chinese infrastructure investments have weak links to growth, Chinese investment leads to limited job creation in host countries, and Chinese development projects lead to environmental degradation (Bradsher, 2019).

Chinese Development Finance

China is not a member of the Organization for Economic Cooperation and Development's (OECD's) Development Assistance Committee (DAC). Its development financial flows to Africa do not align with OECD DAC definitions (Strange et al., 2013). OECD DAC defines official development assistance (ODA) as official financing whose main objective is economic development and welfare in developing countries, with a grant element of at least 25% (Dreher, Fuchs, Parks, Strange, & Tierney, 2017). AidData's global dataset of Chinese development finance found that China provides very little aid in this strict sense globally, with the large proportion of Chinese development finance being categorised as other official flows (i.e. official finance that lacks development intent or a minimum level of concessionality) (Dreher et al., 2017). As such, Chinese overseas financial flows are not directly comparable with DAC members' flows to the developing world, and it can also be challenging trying to determine which investments or loans are development finance (Strange et al., 2013). China, along with Brazil and India, has also argued that "south-south" cooperation should not be held to the same standards as Western development aid (Strange et al., 2013).

Dreher, Fuchs, Parks, Strange and Tierney's (2015) study of Chinese state financing to Africa argues that foreign policy considerations (e.g. recipient countries' UN General Assembly voting patterns and positions vis-à-vis the One China Policy) are the primary driver of Chinese development aid allocation, whilst economic interests are the primary driver behind less concessional and more commercially orientated state financing. Economic drivers of China's less concessional financing include increasing exports and its own domestic development. As such, the motives behind Chinese official finance may not be substantially different from those shaping the allocation of Western finance (Dreher et al., 2015). Landry (2018a) argues that bilateral trade plays a statistically significant, positive role in predicting China's development finance to Africa. China prioritises its commercial partners and the countries it is more politically aligned with when allocating development finance (Landry, 2018a).

It is important to note that whilst Chinese overseas financial flows may have development impacts, not all flows are necessarily intended solely for development purposes. For example, "resources for infrastructure" loans involve the Chinese government offering loans for a package of multipurpose projects, including infrastructure, in order to facilitate access for its companies to a country's natural resources sector (see for example, Li, Newenham-Kahindi, Shapiro, & Chen's 2013 case study of the extractives sector in Tanzania). Chinese official finance also supports infrastructure projects that benefit its companies operating in Africa. For example, in Tanzania, China is supporting improvements to the central Tanzania railway that will facilitate access for steel and iron products produced by one of its state-owned enterprises (SOEs) through Tanzania and into Uganda, Burundi and Rwanda (Li et al., 2013). Other Chinese financing instruments which can have development impacts include non-/ concessional loans, grants, Chinese state

involvement in foreign direct investment (FDI), preferential export buyer's credits, natural resource backed loans, and lines of credit (Strange et al., 2013).

According to Brautigam and Hwang (2016) the majority of finance from China to Africa originates from the policy banks, China Export Import Bank (Exim) and the China Development Bank. The Chinese foreign aid and development finance architecture includes (Strange et al., 2013; ERA, 2009; Brautigam & Hwang, 2016):

- The State Council: shapes China's aid and investment strategy and determines the annual development assistance budget.
- Ministry of Commerce (MOFCOM) and its Department of Foreign Aid: oversees projects financed through zero-interest loans and grants and coordinates with China Export Import (Exim) Bank on concessional loans.
- Policy banks: China Exim Bank and China Development Bank (CDB) provide concessional and non-concessional loans and export credits. It is common for concessional loans provided by the policy banks to carry a requirement for at least 50% procurement for infrastructure projects to be from China or Chinese companies and for a Chinese enterprise to be selected as the contractor.
- Ministry of Finance: debt relief and contributions to multilateral institutions.
- State-owned enterprises (SOEs): often the implementers of Chinese development investment and contractors on non-Chinese funded infrastructure projects. SOEs, with close ties to the national government, also account for 69% of Chinese foreign direct investment into Africa (Shinn, 2016)¹.

The range of actors involved in Chinese financial flows to the developing world also makes it challenging to examine the development impacts of Chinese investments. This report largely focuses on Chinese government-to-government funding, loans and concessional loans, the Chinese policy banks and SOEs. The role of small and medium private enterprises (SMEs) is largely outside the scope of this report but is included where relevant. For example, much has been written in the media about Chinese-owned mines in Zambia, including violence at the Collum Coal Mine. However, the controversial Collum Coal Mine is a privately-owned Chinese mine, not connected to a SOE or the Chinese government (Sautman & Hairong, 2014).

Evidence Base

The evidence base for this report is limited, which makes it difficult to draw firm conclusions. This report outlines dominant claims about the development impacts of Chinese finance to Africa in the media, grey literature and non-empirical academic literature, and assesses each claim against the available empirical evidence. It prioritises literature from 2010 onwards to ensure that data and analysis are relevant to the dynamics and trends as they are playing out now. It draws on empirical evidence including case studies based on field research and interviews, and datasets from reliable sources. Where possible this report highlights

¹ The remaining 31% comes from private Chinese investment banks with government connections, sovereign funds like the China-Africa Development Fund, Chinese provincial and local governments, and small private companies and individual businesses (Shinn, 2016).

examples from Ethiopia, Tanzania, Zambia and Zimbabwe. The evidence is largely “gender-blind.”

Evidence on the impacts of Chinese investment is partially skewed towards anecdotal evidence (see for example, Wang and Zadek’s 2016 literature review for the *International Institute for Sustainable Development*). A common theme within the literature consulted for this review is the paucity of reliable data and the challenges this poses to understanding the China-Africa relationship and measuring China’s development impact in Africa (Xu & Carey, 2015; Strange et al., 2013; Sun, Jayaram, & Kassiri, 2017). It is hard to ascertain a comprehensive picture, as the majority of studies focus on small samples or particular industries and countries (Sun et al., 2017). This also makes it difficult to extrapolate findings.

This report largely focuses on empirical studies with a rigorous, replicable methodology and therefore draws on a very small evidence base, which means it is hard to draw robust findings in all the examined areas. The challenges posed by the opaqueness of Chinese financial flows (for example, the Chinese government releases few official statistics) means that both AidData and CARI (whose work this report draws on heavily) have used media-based data collection to produce databases of Chinese development assistance (see for example, Strange et al., 2013). This allows quantitative analysis but largely produces disaggregated results.

2. Key findings

It is important to disaggregate China. Chinese investments are not monolithic but made by a range of actors with different operating modalities and varying links to the Chinese government. For example, SOEs are regulated by the Chinese Ministry of Commerce, which suggests the government and China Exim Bank may have more influence over them than privately-owned Chinese companies in Africa who do not have a parent company in China. Xiaoyang and Sun (2016) argue that the level of negative environmental impact of Chinese investment varies by industry and company attributes, including the size and relationship with the government.

China is Africa’s largest construction financier and Chinese companies also win a large share of World Bank-financed infrastructure projects. Estimates vary but Sun et al. (2017) argue that Chinese companies claim nearly 50% of Africa’s internationally contracted construction market. Results from the 2016 Afrobarometer survey illustrate that Chinese financed and/or constructed infrastructure is African citizens’ most appreciated aspect of Chinese involvement in Africa (Lekorwe, Chingwete, Okuru, & Samson, 2016).

When examining Chinese funded and/or constructed projects, it is important to distinguish between projects such as stadiums and government buildings versus transportation and energy infrastructure. The former are likely to be symbolic investments, which are not intended to be economically productive and are sometimes given as “gifts” to cement the relationship between two countries. Whilst no estimates could be found of the split between symbolic and productive investments during the course of this review, there are numerous media references to Chinese constructed public buildings (Dahir, 2018).

Anecdotal evidence of the impact of Chinese investments is largely negative. However, the limited number of rigorous studies consulted for this review suggests a more nuanced picture. For example, Shen’s (2013) survey of government officials in five countries (Liberia, Ethiopia, Rwanda, Nigeria and Zambia) found that there was a perception that Chinese investment in labour intensive sectors led to job creation. However, perceptions of it facilitating

local industrialisation were only found in three countries (Ethiopia, Rwanda, Nigeria) (Shen, 2013). This suggests that the impact of Chinese investment may vary by African country.

There is also a lack of comparative studies, which makes it difficult to determine whether or not Chinese investment is qualitatively different to non-Chinese investment in certain sectors, such as extractives. Only an extremely small number of high-quality comparative studies were found during the course of this review. For example, Isaksson and Kotsadam's (2018) study found a correlation between increasing Chinese aid and decreasing trade union involvement. Their comparison with the World Bank found that World Bank-funded projects do not affect trade union involvement.

As alluded to above, the limited evidence base makes it **difficult to draw robust findings**. The findings from this report can be split into those for which there is a general consensus across a (small) sample of rigorous studies, and those for which more evidence is needed.

General Findings

Chinese investment supports national economic growth and is servicing Africa's widely acknowledged infrastructure gap: a small body of rigorous evidence, largely derived from AidData datasets on Chinese investment in Africa, finds that Chinese investments have positive economic growth impacts including increases in GDP and flattening spatial inequalities.

Chinese investment has mixed impact on local economic development: a small body of rigorous evidence suggests that Chinese investment increases infrastructure access at the local level and that there are positive economic spill overs, including increasing rural access to markets and higher wealth levels. However, there is a consensus that Chinese investment has weak backward linkages (related to the modalities of Chinese investment) and can act as "enclaves," unintegrated with the host country's economy. This can inhibit positive local economic development outcomes.

Chinese investment does lead to job creation: there is consensus across the reviewed literature that Chinese investments and Chinese-owned companies lead to job creation, with estimates of local employment ranging from 75-92% of the workforce depending on the sector. However, there is also consensus that skilled positions are filled by Chinese workers. Skills training is a growing component of large Chinese funded/constructed infrastructure projects and within larger Chinese companies such as Huawei.

Chinese-owned (both by SOEs and private companies) mines potentially have worse labour practices than their non-Chinese competitors: there is a relatively large body of evidence, particularly from Zambia, but also from Zimbabwe, outlining poor labour practices in the mines. Comparative studies are scant, but there is some evidence suggesting that these practices are worse than those at non-Chinese-owned mines.

Chinese development investments in hydropower, infrastructure construction and extractives have resulted in instances of environmental degradation. There are examples of inadequate environmental impact assessments, water and soil pollution and illegal activities. Chinese development investments and private investment activities have been linked to deforestation and illegal logging. It is important to note that investments in hydropower and extractives are often controversial regardless of the donor, due to issues related to environmental degradation and resettlement.

Mounting criticism of the environmental impacts of Chinese investments in Africa has resulted in the Chinese Government and Chinese policy banks issuing new voluntary guidelines to improve standards. However, the literature suggests that the Chinese government, the China Exim Bank and the China Development Bank have more influence over SOEs than the SMEs operating in Africa, particularly those that do not have a parent company in China. These guidelines are also voluntary, and it is assumed that Chinese companies will abide by host country laws. This is problematic as host countries do not always have or enforce strong environmental and social standards for investment projects.

Across the literature, a common theme is the role of African government agency in Chinese investments. Studies of forest loss cover in Tanzania and mines in Zambia suggest that host government agency can condition whether outcomes of Chinese investment are negative or positive. Enforcement of host country regulations and policies can constrain negative outcomes – however, in a number of African countries the regulatory and enforcement environment is weak (see for example, Shinn’s 2016 study of Chinese environmental impacts in Africa). Related to this is the claim that African governments prefer Chinese investments as the absence of aid conditionalities and lower social and environmental safeguards means projects can be implemented quicker (BenYishay, Parks, Runfola, & Trichler, 2016). There is a suggestion in the literature that this could encourage African countries to “shop” their riskiest projects to China in order to ensure they are funded (BenYishay et al., 2016).

More Evidence Needed

Chinese constructed infrastructure is widely believed to be low quality, however, only two studies testing this assertion were found during the course of this review. This is a very limited evidence base and one of the studies does not necessarily test the assertion in a useful manner for the purposes of this report. Hence it is not possible to draw a finding.

Chinese investments in transportation and energy infrastructure are likely to be productive investments but it is too early to say definitively that this is the case. Transportation projects have the potential to contribute to economic growth and dovetail with both the Belt and Road Initiative and host government and regional organisations, such as the East African Community’s plans for transport corridors which will increase trade and lead to economic growth. China Exim Bank loans are largely directed at productive investments: between 2000 and 2015, 44% of loans were for the transport sector, 29% for energy and mining, 5% for water and sanitation, 5% for communications and 17% for other sectors (Eom et al., 2017). High profile infrastructure projects, such as the standard gauge railways (SGR) between Mombasa-Nairobi and Addis Ababa-Djibouti have been subject to a number of criticisms including corruption and poor job creation. However, as they are only just coming online it is hard to judge their economic productivity definitively.

3. Economic growth impacts

Chinese Development Investments and National Economic Growth²

The Chinese government conceptualises its investment in Africa as “win-win,” leading to growth in both China and Africa. At the 2018 Forum on China-Africa Cooperation (FOCAC), China’s President Xi Jinping argued that the goal of China-Africa relations is to make “lives better for our people” and as such, cooperation should deliver real benefits to both China and Africa (Tiezzi, 2018). However, the link between Chinese investment and economic growth is widely debated and particular areas of engagement, such as natural resource backed loans, have been widely criticised (Strange et al., 2013; Alves, 2013). For example, Alves (2013) argues that whilst resource for infrastructure deals have increased access to hard infrastructure such as roads, dams and railways, they have done relatively little for Africa’s economic diversification and helping the continent shift away from resource dependency and towards resource-based industrialisation.

In contrast, a second body of work links Chinese investment, particularly in infrastructure, with national economic growth, defined in terms of GDP and per capita income. Africa has a widely acknowledged infrastructure gap and infrastructure investments are seen as key to ease constraints to economic growth and to spur growth acceleration (Dollar, 2016; Dreher et al., 2017; Wang & Zadek, 2016). Renwick, Gu and Gong’s (2018) literature review argues that there is evidence from Kenya and Ethiopia that China’s infrastructure is adding to the production capacity of these countries. Schoneveld, German and Gumbo’s (2014) empirical case study of Zambia argues that Chinese involvement in the mining sector has contributed to Zambia’s economic recovery and Chinese development finance has resulted in upgraded infrastructure.

What Does the Evidence Tell Us?

A good-sized body of work addresses China’s impact on economic growth. However, a large proportion of this work draws on secondary sources: only a small number of sources are based on empirical data. For example, the RAND Corporation’s 2014 report on *Chinese Engagement in Africa* references a 2010 study by the World Bank that claims infrastructure has been responsible for more than half of Africa’s recent improved growth performance (Hanauer & Morris, 2014). Hanauer and Morris (2014) extrapolate that as Chinese investments represent about one-eighth of external support to Africa, China has been a significant driver of Africa’s growth.

This review identified five studies with clear methodologies that analyse empirical data. These studies show a generally positive impact on economic growth measures and consider Chinese aid, concessionary and non-concessionary loans and FDI. However, there are limitations to this small evidence base.

Chinese Foreign Direct Investment

Weisbrod and Whalley (2011) argue that for the period 2005-2009, Chinese foreign direct investment (including FDI backed by the Chinese government through companies’ access to low-cost credit) contributed up to a 0.5% point per year increase to individual sub-Saharan countries’

² Issues concerning debt sustainability are considered in the second report in this two-part series.

GDP growth. The authors analysed 13 countries including Ethiopia, Tanzania and Zambia. For example, in Zambia for 2006-2008, Chinese investment elevated GDP growth by 0.44%-0.67% per annum. However, it is important to note that copper prices were high during this period, so the effect may not be the same after 2010 and the end of the commodities boom. Chinese investment during the study period expanded from having significant growth effects in a relatively small group of core countries (Nigeria, Niger, Sudan, Zambia, and to a lesser extent DRC) in the years preceding the global financial crisis, to having noticeable, if smaller, growth effects in a wider range of sub-Saharan countries during the years of the crisis (2008-2009). The results suggest a significant, albeit in some cases small, amount of elevated growth in sub-Saharan Africa can be attributed to Chinese investment.

Donou-Adonsou and Lim (2018) argue that Chinese foreign direct investment (including through or facilitated by the Chinese government established China-Africa Development Fund) has a positive effect on the standard of living defined in terms of per capita income. The authors analyse 36 sub-Saharan countries for the period 2003-2012 and find that a 1% rise in Chinese FDI raises per capita income by 0.029%. However, the study also finds that a 1% rise in US FDI raises per capita income by 0.089%. The authors argue their study fills a gap, as the link between Chinese FDI and the income of African countries has not really been studied.

Chinese Aid

Dreher et al.'s (2017) study into the extent Chinese aid (including aid, concessional and non-concessional state financing) affects economic growth in recipient countries argues that Chinese aid boosts economic growth. For the average recipient country, Dreher et al. (2017, p. i) estimate that "one additional Chinese ODA project produces a 0.7 percentage point increase in economic growth two years after the project is committed." This effect is sizable in relation to the fact that the average economic growth rate of recipient countries is 2.8% points. However, the study was based on AidData's global dataset *Global Chinese Development Finance*, which includes 138 countries for the period 2000 and 2014³. The data in the study is presented in aggregate form and not per region, so contributions to African growth, as opposed to results for the average country, are not presented.

In terms of sub-national growth, there is some evidence that Chinese investment contributes to sub-national growth and flattens spatial inequalities within and between regions in a country. Dreher et al.'s (2016) investigation into whether more Chinese aid (including aid, concessional and non-concessional forms of state financing) is allocated to African leaders' birth regions, also examines the impact of Chinese aid on regional development. The study uses AidData's *Chinese Official Finance to Africa* dataset⁴ and per capita night-time light emissions as a measure of subnational economic activity. Results show that a 10% increase in Chinese aid increases regional GDP by approximately 0.24%. Chinese funding has an immediate, positive effect on per

³ This is a new dataset of official financing (foreign aid, concessional and non-concessional state financing) constructed using a publicly available method called Tracking Underreported Financial Flows to collect comprehensive financial, operational and locational information about Chinese government-financed projects over the 2000-2014 period. This method triangulates data from four types of open sources – news reports (English, Chinese and local-language); official statements from Chinese ministries, embassies and economic and commercial counsellor offices; the aid and debt information management systems of finance and planning ministers in counterpart countries; and, case study and field research undertaken by scholars and NGOs (Bluhm et al., 2018).

⁴ The dataset contains 1,650 projects committed to 49 countries for 2000-2012 during writing of this article.

capita night-time light output at ADM2 level (for example, district/municipality), with the magnitude of the effect increasing over time. At the ADM1 level (for example, province/state), a similar effect occurs, but with a three-year delay.

Measuring local economic activity using official data is extremely difficult (Bluhm et al., 2018). Night-time light intensity is increasingly being used by researchers and academics as a proxy for local economic activity, as studies show changes in light emissions correlate strongly with traditional measures of welfare down to the village level (Bluhm et al., 2018). However, there are some reservations in the academic literature about how reliable this is as measure of economic activity at the subnational level (see for example, Mellander, Lobo, Stolarick, & Matheson, 2015).

The results of Bluhm et al.'s (2018) working paper suggest that Chinese government-financed infrastructure projects in general, and transportation projects in particular, reduce economic inequality within and between subnational localities. Infrastructure projects produce positive economic spill-overs that flatten the spatial distribution of economic activity by dispersing it outside of a small number of economic centres. This study is also based on data from AidData for 138 countries between 2000 and 2014: within this dataset, projects are densely concentrated in Africa and Asia. However, results are presented in aggregate form for the average country and there is no breakdown by region or country, which makes it hard to determine the results on Africa specifically.

What Can We Conclude?

The results of the studies discussed above suggest that **Chinese investment positively contributes to national economic growth and can also contribute to flattening spatial inequalities**. However, it is not possible to draw firm conclusions on the basis of five studies, particularly when results within this small evidence base are largely produced at the aggregate level, which could mask variations between countries.

Chinese Investments and the Local Economy

A small body of literature examines the impacts of Chinese investment on the local economy. Popular claims within media and secondary sources include that Chinese investments do not create backwards linkages to the local economy, depend on procurement from China, do not create local jobs, and can act as “enclaves” without positive spill-over benefits such as communal welfare benefits (see for example, Wegenast, Struver, Giesen, & Krauser, 2017; Gardner, 2018; Alves, 2013). Schoneveld et al.'s (2014) case study of Zambia argues that Chinese companies tend to agglomerate, servicing each other both horizontally and vertically creating enclaves with few linkages to the domestic economy.

However, when examining these claims it is important to disaggregate China, as different actors and different types of financing have different types of modalities, affecting whether or not linkages can be created with the local economy. For example, concessional foreign aid loans provided by China Exim Bank operate as government to government development finance for projects that generate economic or social benefits, including infrastructure projects and imports of essential equipment and machinery (Brautigam & Hwang, 2016, p. 24). These loans can require at least 50% of the goods and services procured under the loan to come from China (Brautigam & Hwang, 2016). Wissenbach and Wang (2017) argue that the controversy over Chinese procurement is linked to a misconception that Chinese financing in developing countries is the same as development aid. Similarly to other export-import banks, the goal of China Exim

Bank is to provide access to credit for buyers of a nation's goods. The majority of official Chinese investment goes through the China Exim Bank. Brautigam and Hwang (2016) argue that China has provided USD 86.3 billion in loans to African governments and SOEs between 2000 and 2014, with USD 59 billion provided by China Exim Bank and USD 13.7 billion by China Development Bank. During this period, the Chinese government provided USD 3.5 billion in zero-interest loans and approximately USD 2.65 billion in grants (Brautigam & Hwang, 2016). Grants and zero-interest loans often have a condition attached that the majority, if not all, procurement is sourced from a list of approved Chinese firms (Freeman & Boynton, 2011).

What Does the Evidence Tell Us?

Backwards Linkages and Procurement

Case studies of particular infrastructure projects, for example the Benguela Railway in Angola (Duarte, Pacheco, Santos, & Tjonneland, 2015), illustrate that procurement in Chinese-funded and constructed infrastructure projects is largely from China. Resource for infrastructure loans deals also link infrastructure construction with Chinese companies and procurement from China. For example, dam building in the Republic of Congo and the construction of a power plant in Sudan were financed in return for prospective oil production, with loans channelled through Chinese banks and the work carried out exclusively by Chinese construction firms (Wegenast et al., 2017). However, this is to be expected considering the modalities of non-concessional and concessional loans provided by the Chinese policy banks and grants from the Chinese governments.

A 2017 McKinsey & Company report found that procurement by 1,000 Chinese companies in eight sub-Saharan countries is low, with only 47% of procurement by value being locally sourced (Sun et al., 2017). Sun et al. (2017) estimate that 90% of these companies are privately owned, disputing the idea of a monolithic China Inc. operating in Africa. Wang and Zadek's (2016) literature review identifies a number of empirical studies that provide potential explanations for low levels of backward linkages by Chinese companies. These include the absence of local networks of specialised suppliers or, where they do exist, the low quality and high costs means firms turn to suppliers in China; higher transaction costs when dealing with local suppliers due to cultural and language distance; and lower capacity and skill levels of host country suppliers (Wang & Zadek, 2016). For example, Kim and Tukic (2018) argue that whilst Tanzania is strengthening local procurement regulations, external partners are frustrated with the poor quality of the supply chain network, including chronic shortages and high prices of materials (e.g. cement) which can clog up the supply chain flow and cause project delays.

Household Welfare

Martorano, Metzger and Sanfilippo (2018) investigate the impact of Chinese aid (including state-financed concessional and non-concessional loans) at the household welfare level (measured in terms of wealth and education status) in 13 sub-Saharan African countries, including Ethiopia and Zimbabwe⁵. The authors matched geocoded data on Chinese projects (including transport, energy, education and health projects, amongst others) from AidData's *Chinese Official Finance*

⁵ Benin, Cote d'Ivoire, Ethiopia, Ghana, Guinea, Kenya, Malawi, Namibia, Nigeria, Senegal, Togo, Uganda and Zimbabwe.

to Africa⁶ with geocoded household data from Demographic and Health Surveys at two points in time (before and after the inflow of Chinese aid) to assess the impacts on households that live in proximity to a project.

The study found that households in proximity to Chinese projects are more likely to be wealthier and in a higher wealth quintile, stay in school longer and achieve a higher educational attainment than households that are not in proximity to a Chinese project. Sectoral analysis of the data found that economic projects generate broader benefits than social sector projects. The authors are hesitant to apply causality to the link between proximity to a Chinese project and being wealthier because wealth indicators for the majority of the sample countries are only available for the latest round of the Demographic Health Survey (post-Chinese aid). Education data is available for both before and after.

Case Study Evidence

Kragelund and Carmody's (2016) case study of the impacts of Chinese, Indian and South African companies on local economic development in Zambia is based on fieldwork conducted between 2012 and 2015. Findings include a relative lack of linkages and spill-over to the local economy. Chinese, Indian and South African investment has not led to structural transformation of the economy. They argue the Zambian economy has become less diversified, as the huge influx of commodity-related investments have no or few linkages to locally owned companies. Consequently, few spill-overs have occurred, which makes it hard to build local technological capabilities: this works against structural transformation rather than promoting it. The authors also suggest that the way Chinese companies interact with locally owned firms largely mirrors the interactions of actors from the global North. However, it was not possible during the timeframe of this review to compare similarities and differences in how Chinese companies and their counterparts interact with local companies.

Duarte et al.'s (2015) study of the Benguela Railway, Angola, identifies a number of positive economic spill-over effects, including reaching under-served rural communities, facilitating the reestablishment of commercial links between rural and urban centres, as well as increasing the number of small-scale trade centres in rural areas along the railway and providing informal employment for motorbike taxis.

What Can We Conclude?

The impacts of Chinese investments on local economic development are mixed and it is not possible to draw a robust conclusion due to the limited evidence base. There is a general consensus that procurement from local suppliers and companies is low, which limits the depth and breadth of backward linkages. However, this relates to the operational modalities of the Chinese policy banks. There is some evidence that living in proximity to a Chinese aid project in sub-Saharan Africa has a positive impact on household welfare and that the Benguela Railway has had positive local economic spill-over effects.

⁶ This dataset contains 1,955 geocoded projects in 50 African countries, spanning 3,545 locations and covering the years 2000 to 2012.

4. Productiveness of Infrastructure Projects

China is criticised for financing politically motivated and economically unsustainable projects (Bluhm et al., 2018). For example, literature from the period 2007 to 2012, surveyed by Strange et al. (2013), argues that China funds the construction of hospitals but does not provide staff or equipment, undermining their long-term sustainability, and that China funds highly visible projects such as stadiums that offer limited or transitory economic benefits.

The counter argument is that Africa's infrastructure gap constrains growth and China is filling a gap in infrastructure funding, as traditional bilateral donors are largely absent from this sector (Alves, 2013; Strange et al., 2013; Dollar, 2016; Renwick et al., 2018; d'Orey & Prizzon, 2017). High-quality infrastructure is critical for Africa to achieve the SDGs, the African Union's Agenda 2063 and the African Development Bank's High Five Goals (Renwick et al., 2018). Africa's infrastructure indicators are low, with electricity, transportation and communications capacity amongst the lowest in the world and particularly acute needs in sub-Saharan Africa (Alves, 2013; Renwick et al., 2018). In 2018, the African Development Bank estimated Africa's infrastructure need was USD 130-170 billion a year, with a current deficit of USD 68-108 billion a year (Renwick et al., 2018).

China is Africa's largest construction financier and it has supported many of Africa's most ambitious infrastructure developments in recent years (Sun et al., 2017). Chinese firms claim nearly 50% of Africa's internationally contracted construction market (Sun et al., 2017). Strange et al. (2013) argue that China provides demand-driven assistance that delivers tangible results in a relatively short period of time. Results from the 2016 Afrobarometer survey show that infrastructure is African citizens' most appreciated aspect of Chinese involvement in Africa (Lekorwe et al., 2016).

There is also a regional dimension to China's infrastructure investment and links to its Belt and Road Initiative (Renwick et al., 2018). For example, the new Mombasa-Nairobi standard gauge railway is part of Belt and Road (Wissenbach & Wang, 2017). China and the African Union signed a MOU in January 2015 to strengthen cooperation in infrastructure, particularly in regional connective infrastructure such as cross-border railways and roads to promote integration between countries (Renwick et al., 2018).

The Quality and Functionality of Chinese Infrastructure Projects

There is a wealth of anecdotal evidence that Chinese-constructed and/or funded infrastructure is low quality⁷. The most prominent examples include infrastructure that is non-functioning or suffers from severe problems. These include a bridge that collapsed in Kenya in 2017 (Duggan, 2017), claims of "shoddy work" on power stations in Botswana (Ndlovu, 2014), a Chinese built hospital in Angola that closed due to cracks (Redvers, 2010), "shoddy construction" of two dams in Uganda (Matsiko, 2016), and poorly constructed roads in Ethiopia and Zambia (Balambaras, 2014). In the case of the bridge collapse in Kenya, the political opposition leader Raila Odinga publicly blamed the government, arguing that they rushed the project for political purposes (Duggan, 2017). Evidence-based assessments of these construction projects could not be found during the course of this review. Therefore, it is not possible to substantiate whether low quality

⁷ See for example, https://www.huffingtonpost.com/entry/china-infrastructure-africa_us_57b32e3ae4b0863b0284d2b3?guccounter=1

projects are the result of a lack of Chinese company compliance with standards, whether the infrastructure has been designed to a low specification, or if there has been a lack of monitoring from host governments.

Academic and grey literature also cites concerns over quality (see for example, Alves, 2013; Wang & Zadek, 2016). Landry (2018b) argues that resource for infrastructure deals can be prone to quality problems and there is an assumption that they are not held to the same quality controls as projects funded through traditional modes of financing. However, few concerns regarding quality can be substantiated (Landry, 2018b).

What Does the Evidence Tell Us?

During the course of this report, only two empirical studies were located that focused on the quality of projects constructed by Chinese companies. Benazeraf's (2014) case study of Chinese constructed roads and housing in Nairobi supports the low-quality narrative. Based on observations and interviews in Nairobi in 2012, Benazeraf (2014) highlights criticisms of the new Nairobi-Thika Highway, including engineering defects, incompatibility with local standards, and poor attention to detail due to the speed at which the project was implemented. Benazeraf (2014) concludes that it is too early to measure how well the project will stand the test of time and the lower initial costs from contracting Chinese companies could turn out to be higher over the long-term.

Chinese companies have developed a strong track record of winning World Bank-financed projects in Africa. These projects are often open tender, involving a competitive process with the lowest price conforming bid winning the contract. Between 2007 and 2015, Chinese contractors won one-third of World Bank funded infrastructure contracts across Africa (Farrell, 2016). In 2013, China won 17% of World Bank-financed civil works contracts in sub-Saharan Africa by number, and 42% by value (Gutman & Zhang, 2015). This suggests that Chinese companies may have lower costs than other companies.

Farrell (2016) tests the assertion that Chinese transportation infrastructure is of low quality by comparing World Bank-funded projects constructed by Chinese companies with those constructed by OECD country firms. The study found no statistically significant difference in quality of work between Chinese firms and OECD firms on World Bank transportation contracts won between 2000 and 2007 and completed by 2013 (Farrell, 2016). However, it is important to remember that as World Bank-financed projects, the winning contractor would have to comply with World Bank standards. Therefore, the conclusions from Farrell's (2016) study illustrate that Chinese contractors comply with World Bank standards when working on World Bank projects. No comparisons could be found during the course of this review of the quality of Chinese-funded and implemented projects in Africa compared to projects financed by the World Bank or other actors in Africa.

Several media reports and some grey literature (including the 2017 McKinsey & Company report) state that claims of poor-quality infrastructure are a misperception (see for example, a 2016 article by the China Africa Project⁸). However, these sources all draw on Farrell's (2016) working paper from the China Africa Research Initiative at John Hopkins University. The McKinsey &

⁸ The China Africa Project is part of the non-profit US Asia Society's Centre for US-China Relations founded by the Rockefeller family in the 1950s. The article can be accessed here: <http://www.chinafile.com/china-africa-project/chinas-undeserved-reputation-building-bad-infrastructure-africa>

Company report does supplement Farrell's conclusions with findings from qualitative interviews with African government officials, suggesting that China's contribution to infrastructure includes speedy delivery without compromising on quality (Sun et al., 2017). Moreover, one African government official stated that Chinese bids for contracts were routinely 40% cheaper than the next lowest bid for similar levels of quality (Sun et al., 2017). However, this claim could not be substantiated during the course of this review.

What Can We Conclude?

It is not possible to draw a finding about the quality of Chinese infrastructure projects on the basis of two academic studies and anecdotal evidence.

The Economic Viability of Chinese Infrastructure Projects

The economic viability of a number of Chinese-funded infrastructure projects, including the Djibouti-Addis Ababa railway and the Mombasa-Nairobi railway, have been widely questioned^{9,10}. For example, the chief economist at Sinasure, the Chinese-state owned insurer, publicly stated they have been forced to write off USD 1 billion in losses on the Djibouti-Addis Ababa railway and that the project's due diligence has been "inadequate."¹¹ Some media reports have labelled large projects "vanity projects" (Pilling & Feng, 2018). At the 2018 Forum on China Africa Cooperation, China's President Xi Jinping stated that vanity projects must be shunned in favour of more carefully assessed initiatives that address proven bottlenecks (Pilling & Feng, 2018).

The following sub-sections largely focus on transportation projects because, along with energy investments, this has been the focus of 60% of Chinese infrastructure investment in Africa. However, Chinese investments have also supported a number of building projects, such as a new library in Dar es Salaam, as well as plans for new or extended airports in Tanzania, Sierra Leone and Zimbabwe. Airports are a potentially controversial area of support as they involve resettlement and land compensation. In 2018, Sierra Leone cancelled a Chinese loan deal to build a new international airport at Mamamah, citing concerns that the project is uneconomical considering the existing international airport is under-utilised (Kazeem, 2018).

What Does the Evidence Tell Us?

There is a relatively good-sized body of working papers and policy briefs examining large-scale Chinese funded and /or constructed infrastructure projects in Africa. These include transportation projects, mines and dams. References to "white elephant" projects can be found in a number of peer-reviewed and academic sources, for example, the new Ministry of Foreign Affairs building in Dar es Salaam (Kim & Tukic, 2018). The literature is skewed towards case studies, which means there are few comparative studies. The evidence base is fairly recent and as such, the focus is often on outlining the project or researching project details. Working papers and policy briefs present a more nuanced view than the media narrative, arguing that a number of factors

⁹ <https://www.ft.com/content/82e77d8a-e716-11e8-8a85-04b8afea6ea3>

¹⁰ In the case of the Kenya Standard Gauge Railway, there are also questions of duplication as at times the railway runs alongside the existing Rift Valley Railway, which is currently the subject of OECD country funding (d'Orey & Prizzon, 2017).

¹¹ <https://www.ft.com/content/82e77d8a-e716-11e8-8a85-04b8afea6ea3>

determine economic viability of individual projects, including risk management and the host governments' policy making processes.

Bräutigam (2018), a leading China expert, argues that a database of Chinese loans to Africa since 2000, compiled by John Hopkins University and Boston University, shows that the majority of Chinese loans are performing a useful service financing Africa's infrastructure gap. There have been some "dud" projects, but overall Chinese loans have comparatively low interest rates, long repayment periods and will boost economic growth (Bräutigam, 2018). However, a lack of transparency and data can make it hard to assess the return on investment and economic viability of individual projects (see for example, Duarte et al., 2015). A number of transportation projects have cross-border elements or are part of planned regional transport corridors, so as such the productiveness of individual projects is connected to the realisation of wider plans and benefits may take some time to become apparent or accrue.

The Mombasa-Nairobi Railway

This is a flagship infrastructure project, which has been subject to domestic criticism as well as concerns about whether the next stage of the project will be completed, as press reports suggest China Exim Bank has cut its funding (Renwick et al., 2018). Part of the Belt and Road Initiative, the standard gauge railway (SGR) is part of a planned/under construction rail network funded/constructed by China, which runs on the standard gauge system, meaning that other railways that want to connect with it will have to operate on standard gauge also (Wissenbach & Wang, 2017; d'Orey & Prizzon, 2017). Built by China Roads and Bridges, its parent company, China Communications Construction Company has been awarded the contract to run the railway for the first five years of operation (despite being on the World Bank's debarred list) (Wissenbach & Wang, 2017).

In 2017, the Government of China outlined a number of benefits to the new SGR, including anticipated 1.5% GDP growth, shorter freight transfers, 46,000 jobs and linkages to the local economy including sub-contracting to Kenyan firms, technology transfers, and skills development through a new railway engineering academy (Renwick et al., 2018). A number of these benefits are disputed, and the SGR has been subject to a number of claims commonly levelled at Chinese projects: questions around its economic viability, corruption, opaque contracting practices, financing arrangement, and community and labour issues (Wissenbach & Wang, 2017). There are claims within the media that Kenya has overpaid for the railway (Solomon, 2018b).

Wissenbach and Wang's (2017) CARI working paper argues that problems with the project are partially due to Kenya's neo-patrimonial culture and governance issues at the national and local levels, as opposed to its status as a Chinese project. Based on fieldwork during the construction phase, the working paper is the first detailed case study of a strategic government-contracted Chinese infrastructure project in Kenya and argues that the railway faces similar implementation problems to many other large infrastructure projects.

The SGR's economic viability is linked to the project's regional dimension: it is part of the planned regional Northern Corridor Initiative aimed at linking Mombasa Port with Uganda and Rwanda (Wissenbach & Wang, 2017). It will also need to be competitive with road transport (Wissenbach & Wang, 2017). As of 2017, the majority of freight from the Port of Mombasa destined for Rwanda, DRC and others is transported by road, and only 0.9 million tonnes (against a throughput of 22 million tonnes) is transported on the old colonial Rift Valley Railway

(Wissenbach & Wang, 2017). The SGR, built alongside the Rift Valley Railway, but without the bends, aims to increase throughput by rail and reduce costs and time by up to 60% (Wissenbach & Wang, 2017). There are some concerns about duplication, as the Rift Valley Railway is currently being renovated by other donors (Wissenbach & Wang, 2017). The SGR may increase the costs of doing business in Kenya in the short-term: to fund the railway, Kenya increased a number of levies and taxes, including the port traffic tax.

Wissenbach and Wang (2017) argue that Chinese investors aligned themselves with Kenya's development priorities as defined by the President. They argue that there is a need to understand African agency in Chinese financed and constructed infrastructure projects: African agency is critical to making infrastructure projects work for inclusive development and profitable economic growth.

Ethiopia

China is the main financier of the energy and railway sectors and a major financier in the road sector: its engagement is largely quasi-commercial, based on loans from the China Exim Bank (d'Orey & Prizzon, 2017). China is currently involved in a number of infrastructure projects including the Addis Ababa Urban Rail project (the first light railway in Africa), the Gibe II hydropower project and the Addis Ababa International Convention and Exhibition Centre (Renwick et al., 2018). Loans from China's Exim Bank for infrastructure projects have often been secured and repaid out of Ethiopia's exports and Chinese companies have been awarded the contracts in return for the Ethiopian government receiving funding (Renwick et al., 2018).

The Djibouti-Addis Ababa Railway is expected to reduce freight transport times from three days by road to 12 hours by train and cut transport costs by one-third (Golubski, 2017). Each train will be able to carry freight equivalent to 220 trucks (Golubski, 2017). The railway is part of Ethiopia's plan to achieve middle-income country status as it links the landlocked country to the sea and lowers transport costs for imports/exports, which will help to "kick-start" industrialisation (Gardner, 2018). Criticisms of the project include poor land compensation mechanisms and limited job creation, with low wages and bad treatment (Gardner, 2018). During the course of this review no rigorous assessment of the viability of the project was found.

Tanzania

Kim and Tukic's (2018) policy briefing on China's role in Tanzania's Bagamoyo port development argues that the success of projects depends on the proper management of risks, uncertainties and the complexity of the policy making process by the host government, rather than Chinese contractors or finance institutions. In addition to developing a new port at Bagamoyo with China Merchants Holding International and an Omani sovereign wealth fund, Tanzania also signed a deal in 2017 with China Harbour Engineering Corporation to expand the port of Dar es Salaam (Kim & Tukic, 2018). The World Bank estimate inefficiencies at Dar es Salaam port are costing Tanzania and its neighbouring countries up to USD 2.6 billion a year (Kin & Tukic, 2018).

Development of both ports has raised questions about duplication and competition between the two ports, and also with Kenya's upgraded Mombasa Port and plans for the Lamu Port-South Sudan-Ethiopia transport corridor (LAPSSET): Tanzania and Kenya are competing to be East Africa's regional transport hub (Kim & Tukic, 2018). Lack of coordination between stakeholders has been identified as a problem by DFID and UNDP, as Tanzania supports a number of transnational corridor projects (Kim & Tukic, 2018). Bagamoyo port has also been identified as a potential legacy project as it is the former President's hometown (Kim & Tukic, 2018).

China is also heavily involved in the railways sector in Tanzania, with plans to revitalise the Tanzania-Zambia railway (originally funded by China in 1970s) and build new SGRs connecting Dar es Salaam and the port of Dar es Salaam with cities in central and western Tanzania and Uganda, Rwanda and Burundi (Tukic, 2015). A Chinese company is also building a new line linking the Chinese-developed mines in southern Tanzania to the port of Mtwara to facilitate exports (Tukic, 2015).

What Can We Conclude?

The projects reviewed in this section all have the potential to contribute to economic growth and address Africa's infrastructure gap. However, the regional dimension and their recent completion mean it is too soon to draw conclusions on their economic productivity. China's involvement in East Africa's railways is part of its support for planned East African transport corridors. Tukic (2015) argues that these developments have significant implications for East Africa in terms of intra-regional trade and travel as well as competition, which has the potential to speed up economic growth. However, there are also questions of duplication and claims that some high-profile projects, such as Bagamoyo Port, are legacy projects.

The productivity of infrastructure investments may also be conditioned by the policy, regulation and governance environment of the host country. Whilst some of the examined projects are part of China's Belt and Road Initiative, they are also projects that have been identified by the host country or by regional associations such as the East African Community, so they are also demand-driven. For example, Wissenbach and Wang (2017) argue that China and Chinese investors have aligned themselves with Kenya's development priorities as defined by the Kenyan President. They argue that there is a need to understand African agency in Chinese financed and constructed infrastructure projects, as African agency is critical to making infrastructure projects work for inclusive development and profitable economic growth.

5. Labour Issues

Labour issues, including the perception that Chinese-funded projects use Chinese labour as opposed to local labour, is one of the areas that has received the most media and grey literature attention (Soule, 2019; Solomon, 2018a). Narratives centre on low wages, poor working conditions, environmental degradation, lack of technological transfer, and low-level skill development (Leslie, 2016).

Chinese Investments and Local Employment

Employment effects of Chinese resource extraction companies operating in developing countries are often reported to be non-existent as they bring in their own workforce, rather than hiring locally (Wegenast et al., 2017). Explanations for this include large rural unemployment in China and cultural and language barriers which inhibit hiring host country labour (Wegenast et al., 2017; Alves, 2013). A 2017 Pew Research Centre study of perceptions of China found that Kenya and Ghana had significantly lower opinions of China than in 2015 (China Power Team, 2016). The China Power Project at the Center for Strategic and International Studies suggest that this could be partly due to the lack of employment opportunities for local workers created by Chinese investments (China Power Team, 2016).

What Does the Evidence Tell Us?

Employment creation: Surveys and official statistics demonstrate that Chinese funded/constructed projects, Chinese-owned resource extraction projects, and Chinese companies lead to local employment. These include:

- Sun et al. (2017): 89% of workers in 1,073 Chinese-owned companies surveyed were African. SOEs reported 81% African employment, whilst SMEs reported 92% African employment.
- Sautman and Hairong (2015) argues that across 400 Chinese enterprises and projects in over 40 African countries, more than 80% of workers are local: this finding is drawn from their database on workforce localisation.
- Wang and Zadek (2016) surveyed a number of studies showing local employment, including a 2013 member survey by the China International Contractors Association that found the local employment rate in Africa was 70%. The Ethiopia light railway by CGC Overseas Construction Group is predicted to employ 300 Chinese workers and more than 5,000 local workers (Wang & Zadek, 2016).
- In Kenya, the construction of the SGR required China Road and Bridge Corporation to employ 40% local staff – as such, it was expected to create 30,000 direct jobs for Kenyans and 13,000 indirect jobs (largely through local companies supplying materials and services (Wang & Zadek, 2016). However, these jobs are potentially short-term, as a Chinese company has been awarded the contract to run the railway for the first five years.
- Sinkala and Zhou's (2014) study into Chinese FDI and employment creation in Zambia uses secondary data obtained from the Zambia Development Agency and finds that over 10,000 jobs were created for Zambians.
- Surveys of Chinese companies in Mozambique, Kenya and Uganda in 2015 reported local job creation (Weng & Buckely, 2016).
- Shen's (2013) survey of government officials in five countries (Liberia, Ethiopia, Rwanda, Nigeria and Zambia) found that there was a perception that Chinese investment in labour intensive sectors led to job creation.

A four-year SOAS research project examining employment patterns and outcomes in the infrastructure construction (specifically road infrastructure) and manufacturing sectors in Angola and Ethiopia found that Chinese firms do create local employment (Oya & Schaefer, 2019). In Ethiopia, 90% of all workers were local nationals, and in Angola an estimated 74% were local nationals (Oya & Schaefer, 2019). Skill shortages in Angola may be one reason why the rate is lower than for Ethiopia (Oya & Schaefer, 2019).

In contrast, a 2017 Working Paper by the German Institute of Global and Area Studies finds that proximity to Chinese-operated mines is associated with unemployment. Wegenast et al. (2017) combine a dataset of mining control rights between 1997 and 2015 for 21 sub-Saharan African countries, with geocoded data from three rounds of the Afrobarometer survey which includes information on employment status and access to infrastructure (defined as piped water and access to paved/tared roads). The robustness of the findings is tested by performing multilevel mixed-effects models using district-level data from the Demographic Health Survey. Wegenast et al. (2017) find that proximity to Chinese-operated mines is associated with unemployment, but populations living closer to Chinese mining areas enjoy better infrastructure. Comparison with

non-Chinese controlled mines shows that proximity to a non-Chinese controlled mine significantly reduces the risk of unemployment, but has lower effects of access to infrastructure outcomes (Wegenast et al., 2017).

Job roles: There is some evidence that the proportions of local employment are lower for managers and skilled positions, although there are also variations across countries and sectors, suggesting a more nuanced picture (Suatman & Hairong, 2015; Oya & Schaefer, 2019). For example, Sun et al.'s (2017) survey found that only 33% of managers in the construction sector were African. In contrast, firm level surveys conducted by Oya and Schaefer (2019) found that in Ethiopia, Chinese construction firms hire local managers for middle-management positions. However, this was much rarer in Angola.

The workforce in many Chinese firms in the construction and manufacturing sectors in Angola are largely poorer migrant workers with lower education levels and less relevant sector work experience (Oya & Schaefer, 2019). In contrast, a relatively higher-skilled segment of workers, with education levels above the average urban worker and more sector work experience, were found in Angolan and other foreign firms (Oya & Schaefer, 2019)¹². However, Oya and Schaefer (2019) argue that these segments represent the different employment dynamics of Chinese firms that entered the Angolan market approximately 10 years ago, in contrast to Angolan and other foreign firms that have a more consolidated position. In Ethiopia, the workforce in Chinese firms is similar to that in other foreign firms (Oya & Schaefer, 2019). Take-home wages were broadly similar in Chinese firms sampled by Oya and Schaefer (2019) to those in other top firms in the same sectors, once other worker and company characteristics are taken into account, in both Ethiopia and Angola.

There is a lack of transparency around official job creation claims. For example, China Railway Construction Company said it employed 100,000 Angolans on reconstruction of the Benguela Railway and trained 10,000 as railway technicians – however, there is no hard data available to verify this claim (Duarte et al., 2015).

Contribution to skills and training: Wang and Zadek (2016) argue that whilst it is recognised that Chinese enterprises hire local people, the focus of the debate should be more on job roles held by local workers and opportunities for training and advancement. Sun et al.'s (2017) survey found that 53% of Chinese construction companies offer apprenticeships and there is a focus on skills training because of substandard vocational training in Africa. In Ethiopia, training is widespread in the manufacturing sector and is considered necessary by firms (Oya & Schaefer, 2019). Chinese firms contribute to skills and training in Ethiopia as much as other firms in the same sector (Oya & Schaefer, 2019).

ICT companies Huawei and ZTE engage in technology transfer through establishing training centres in host countries (including a ZTE one in Ethiopia) and developing joint training programmes with universities and national telecom countries (Wang & Zadek, 2016). One study cited by Wang and Zadek (2016) estimates that Huawei has trained 12,000 African engineers and workers a year since 1997; hired 65% of its total staff from Africa; and created over 10,000

¹² Oya and Schaefer (2019) is one of the only studies that could be found that compares Chinese labour practices in Africa with those of other foreign firms.

jobs indirectly. The same 2011 study estimates Sinihydro has trained 8,200 local workers in its 30 projects in Angola (Wang & Zadek, 2016).

What Can We Conclude?

Chinese-funded projects and investments do lead to employment for Africans. However, skilled positions are more likely to be occupied by Chinese workers. A relatively good-sized body of literature examines the local employment impacts of Chinese investment, with some studies testing the assertion by analysing official figures or by synthesising existing country studies. Findings across the evidence base are largely consistent: Chinese-funded projects and investments employ a large proportion of Africans (estimates vary from 75% to 89%). Wegenast et al.'s (2017) study finds that proximity to a Chinese-owned mine across 21 sub-Saharan African countries is correlated with unemployment. This is an aggregate finding and it could be that it varies across countries. For example, case study evidence from Zambian mines argues that the majority of workers are Zambian, not Chinese (see for example, Sautman & Hairong, 2014). The body of evidence suggests that skilled positions are more likely to be occupied by Chinese workers, but there are variations across sectors and countries. Skills training and technology transfer are growing areas of interest for Chinese companies operating in Africa.

It is important to note that few studies compare the employment practices of Chinese companies with those of other foreign companies operating in Africa or domestic companies. Oya and Schaefer's (2019) study compares the working conditions of Chinese firms in Ethiopia and Angola with domestic firms and other foreign firms in terms of labour force segmentation, take-home wages and training. Overall, Oya and Schaefer (2019) argue that the national, sector and economic context are more important in understanding labour conditions in Africa than the country origin of the firm itself. More research is needed into how Chinese companies' practices compare to those of other foreign companies and the variation across countries in Africa and sectors.

Claims of Workers' Rights Violations, Abuse and Unsafe Practices

The 2017 McKinsey report argues that instances of unfair or unsafe business practices, particularly in resource extraction, that threaten worker safety as well as the environment are the most troubling aspect of Chinese investment impacts (Sun et al., 2017). African labour and civil society organisations as well journalists and academics have raised concerns about poor worker safety standards, low wages, violations of host country labour and environmental laws and authoritarian managerial practices (Zezeza, 2014).

The mining sector is a particular area of concern. For example, Ojajorotu and Kamidza's (2018) peer reviewed journal article examining the relationship between China and Zimbabwe draws on secondary sources to outline claims of worker abuses by Chinese companies, particularly in the diamond mines, including the absence of protective clothing and physical abuse. Elcoate (2018) argues that in the case of Zambian mines, criticism of China is apt.

Chinese mineral companies are concentrated in four countries – Zambia, Zimbabwe, South Africa and the DRC – but there are negative views of Chinese employers in various countries' resource sectors (Wegenast et al., 2017). There have been protests in Chad, Namibia and Niger over bad payment and poor working conditions at Chinese-operated mines; accusations of illegal safety practices, hostility to trade unions and dangerously long shifts in Zambia; and the alleged loss of jobs to Chinese employees leading to protests in Nigeria, Namibia and Zambia

(Wegenast et al., 2017). There is a belief that Chinese companies violate labour and environmental standards more than other mining operations (Wegenast et al., 2017). The media and NGOs regularly point to widespread wage-related grievances among local employees of Chinese mining facilities in sub-Saharan Africa (Wegenast et al., 2017).

Claims of poor wages and violations of labour laws exist in other sectors as well. For example, Tyitende's (2016) commentary on Chinese involvement in the Namibian construction sector highlights claims that Chinese companies do not pay national minimum wage and do not provide employees with protective clothing; however, it highlights that Namibian companies also do not pay the national minimum wage.

What Does the Evidence Tell Us?

Considerable literature identifies poor employment conditions that fail to meet domestic and international standards, with the most cited example being the mines in Zambia (Wang & Zadek, 2016). There is a good-sized body of literature case studying Chinese labour practices and protests in the Zambian mining sector, which outlines bad and unsafe labour practices (see for example, Leslie, 2016; Human Rights Watch, 2011). However, Strange et al. (2013) argues there is a lack of statistical evidence to corroborate allegations of poor Chinese labour practices on a wider scale.

Chinese-Owned/Operated Mines in Zambia

China's involvement in Zambia's mining sector includes both SOEs, such as the China Non-Ferrous Metals Mining Corporation, and privately-owned companies, who do not have a parent company in China. Sautman and Hairong's (2014) case study of the privately-owned Collum Coal Mine draws on documentary sources and interviews with union leaders, workers and officials in Zambia from 2011-2013 (Sautman & Hairong, 2014). It outlines poor working conditions, low wages and allegations of management beating miners, as well as disputes between workers and management, including strikes in 2008 and 2009 over pay and conditions (Sautman & Hairong, 2014). A shooting at the mine in 2010, where Chinese supervisors shot and wounded 13 Zambian protesters, received international attention (Sautman & Hairong, 2014).

A 2011 Human Rights Watch report into four Zambian copper mines, run by subsidiaries of China Non-Ferrous Metals Mining Corporation (CNMC), draws on three field missions and over 170 interviews, including 95 with workers from Chinese-run mines and 48 with workers from other multinational companies' mines, in order to allow comparison. The report identified a number of practices that violated Zambian labour laws and international labour standards, including:

- Poor health and safety conditions (e.g. not replacing damaged personal protective equipment, inadequate ventilation and threats to fire workers who refused to work in unsafe places underground).
- Excessive working hours (12- or 18-hour shifts, which workers claim contribute to accidents).
- Anti-union activities (including threats and intimidation to stop workers from joining the union of their choice; docked pay; and unrenewed contracts for outspoken union reps).

These findings are consistent with other case studies, such as Leslie (2016), that also identify a number of problems in the mining sector, including accidents and explosions, poor wages and violations of labour laws resulting in strikes and protests.

The role of the Zambian government has also been assessed in terms of its enforcement of the regulatory environment (see for example, Human Rights Watch, 2011). Leslie (2016) outlines that Zambia has taken some steps to ensure Chinese companies comply with laws, including inspections and suspending licenses. For example, the Collum Coal Mine license was suspended in 2006 and 2010 for health and safety violations and revoked in 2013 following an accident in which one miner died and another was injured (Sautman & Hairong, 2014). The government is also taking steps to limit casualisation (the practice of hiring workers on short-term contracts to avoid providing statutory benefits) in the mining sector – this has been a problem in Chinese-operated mines (Dynamic, 2015). A 2009 study shows strong unions were able to convert casual jobs into permanent ones at a Chinese company in Zambia that manufactures explosives (Wang & Zadek, 2016).

Comparative studies are rare, and those identified by Wang and Zadek (2016) suggest contradictory findings. For example, a comparative study of Chinese companies and their counterparts from OECD countries concludes that there are no substantial differences related to working conditions between Chinese companies and those from other countries (Wang & Zadek, 2016). However, some grey and academic literature found evidence that Chinese companies pay lower wages than local and foreign companies and often break regulations (Wang & Zadek, 2016). In the case of Zambia, a 2009 study found Chinese copper mines paid workers 30% less than other copper mines (Wang & Zadek, 2016). Sautman and Hairong (2014) argue that the pay gap represents differences in size and profitability, but the gap narrowing and Chinese-owned copper mines have similar safety records to larger mines owned by Western-based firms. In contrast, Human Rights Watch (2011) argue that Chinese practices fail to meet the standards of their competitors in the Zambia's copper industry. For example, eight-hour shifts are standard at mines run by other multinational companies, in line with Zambia's 48-hour working week.

Trade Union Involvement

Isaksson and Kotsadam's (2018) quantitative analysis of the link between Chinese investment and trade union involvement found that Chinese development projects discourage trade union involvement in the local area. There is correlation between increasing Chinese aid and decreasing trade union involvement, as opposed to World Bank-funded projects, which do not affect trade union involvement (Isaksson & Kotsadam, 2018).

Isaksson and Kotsadam (2018) matched georeferenced data on the subnational allocation of Chinese development projects in 18 African countries between 2000 and 2012 with 41,902 survey respondents from rounds two and three of the Afrobarometer. The authors compared the trade union involvement of individuals living near a site where a Chinese project is being implemented to those where one will appear in the future, but implementation had not started at the time of the survey (Isaksson & Kotsadam, 2018). The results indicate that lower unionisation rates near ongoing, as compared to future, Chinese project sites stem from direct measures to discourage union involvement (Isaksson & Kotsadam, 2018). The relatively wide geographic reach of the observed effect suggests that restrictions in union rights at Chinese project sites affects union rights at other companies in the area (Isaksson & Kotsadam, 2018).

Oya and Schaefer's (2019) study of Ethiopia and Angola found differences between the two countries, sectors, and the country of a firm's origin, with regards to the presence of trade unions. In Angola, there is a large difference between the presence of trade unions in Chinese companies (less than 10%) compared to Angolan and other foreign companies (just over 40%) according to firm level survey data (Oya & Schaefer, 2019). In contrast, in Ethiopia there is a greater prevalence of trade unions among Ethiopian companies than amongst Chinese and other foreign companies (Oya & Schaefer, 2019).

What Can We Conclude?

The evidence base suggests that **poor labour practices by Chinese-owned companies are common in the resource extraction sector**. However, the comparative evidence base is small, which makes it **harder to determine whether Chinese-owned companies have worse practices than or similar practices to their non-Chinese competitors**. There is evidence from Zambian mines that Chinese-owned company practices are worse than those at non-Chinese-owned mines.

Isaksson and Kotsadam's (2018) study finds that **unionisation is lower in areas in proximity to Chinese projects** and that this has spill-over effects to proximate non-Chinese companies. There is a wealth of anecdotal evidence that supports this claim. Oya and Schaefer's (2019) study, which includes firm-level survey data and interviews with trade unionists and workers, suggest that unionisation rates are affected by the sector and country in which a firm operates. However, in both Ethiopia and Angola, unionisation was lower in Chinese companies than in national companies (Oya & Schaefer, 2019). It is not possible to draw a robust conclusion on unionisation on the basis of two studies.

6. Environmental and Social Issues

Chinese environmental practices in Africa have been widely criticised, particularly by the environmental advocacy community, on the grounds that China finances and constructs projects with weak environmental standards (Shinn, 2016). Chinese extractive companies have been sanctioned by host countries for poor practices. For example, Sinopec were accused of illegally prospecting for oil in Gabon's Loango National Park in 2006, and in 2013 the Chadian government suspended China National Petroleum Corporation's license for oil exploration on environmental grounds (Xiaoyang & Sun, 2016). However, BenYishay et al. (2016) argue that there is no systematic evidence that confronts the causal claim that Chinese-funded development projects have negative environmental impacts.

Large infrastructure projects, including hydropower dams and transportation projects, entail resettlement of affected communities and compensation. They also raise issues related to environmental damage to the livelihoods of African host communities (Wissenbach & Wang, 2017). Whilst no academic or grey literature could be located during the timeframe that specifically focused on resettlement, working papers, policy briefs and research briefs by centres including the China Africa Research Initiative outline resettlement issues in a number of infrastructure projects. For example, land compensation has been controversial in the case of the Mombasa-Nairobi SGR (Wissenbach & Wang, 2017). Land is a sensitive issue in Kenya and many communities along the railway line expressed unhappiness with the land compensation scheme and the amounts they were awarded (Wissenbach & Wang, 2017). The Kenyan government were responsible for the land compensation schemes and there are claims that they

do not allocate enough funds for these purposes (Wissenbach & Wang, 2017). Anecdotal evidence of resettlement includes the forcible eviction of over 400 families in Kipawa, Tanzania, in order to expand Tanzania's main international airport (a Chinese-funded project) (Yin, 2012).

Chinese land-related investments have also received increasing attention in recent years, with claims of "land-grabs" (Wang & Zadek, 2016). The available academic evidence suggests that the scale of this problem is smaller than suggested by the media and there is limited evidence of Chinese land grabs (Wang & Zadek, 2016). Bräutigam (2018) argues that the majority of Chinese-owned farms in Africa are small, less than 100 hectares. There are Chinese agribusiness companies in Africa, but in most cases the amounts of land are smaller than reported and the projects are related to commercial, import-substitution production, or biofuels (Bräutigam & Zhang, 2013 cited in Wang & Zadek, 2016).

Chinese Investments and Claims of Environmental Degradation

China's investments in Africa are often located in environmentally sensitive areas and much of the literature mentions concerns, criticisms and protests about Chinese investments in mining, infrastructure, forestry and agricultural projects (Wang & Zadek, 2016). Chinese investment in the oil sector in Sudan, South Sudan and Chad, and mining investments in the DRC, have all had negative environmental and social consequences including water pollution, resulting in livestock deaths and serious illness in affected communities (Shinn, 2016). Chinese companies have often negotiated mining concessions in the absence of competitive bidding and environmental assessments (Shinn, 2016). Xiaoyang and Sun (2016) and Shinn (2016) outline environmental problems in manufacturing (for example, Chinese-owned tanneries in Ethiopia and Somaliland which have been responsible for water pollution), extractives (for example, water and soil pollution from artisanal mining in Ghana) and construction (there have been cases of Chinese firms paying bribes rather than allocating spending for environmental assessment and protection). China's connections to the illegal ivory and rhino horn trade have also received international attention (Shinn, 2016).

Hydropower Projects

China is the single most important source of funding for and builder of hydropower dams in Africa (Shinn, 2016). There is a good-sized body of academic and grey literature examining Chinese hydropower development in Africa and its environmental and social impacts, including resettlement, flooding protected areas with impacts on wildlife, and reducing communities' access to natural resources.

Controversial Chinese funded and/or constructed projects include the Merowe Dam, Sudan; the Mphanda Nkuwa Dam, Mozambique; the Bui Dam, Ghana; and the Gibe III Dam, Ethiopia (Xiaoyang & Sun, 2016; Shinn, 2016). These projects have all been criticised for their environmental and social impacts (Shinn, 2016). For example, the Bui Dam in Ghana flouted many of the Environmental Impact Assessment's (EIA) recommendations on consultation with local people, health and livelihood security and adequate compensation (Tan-Mullins & Mohan, 2013). The EIAs for both the Merowe Dam and the Mphanda Nkuwa Dam have been labelled inadequate (Shinn, 2016).

A comparative study of large Chinese-financed hydropower dams in Africa and Asia found that Chinese investment is supporting economic growth and development opportunities, especially in low-carbon energy generation (Tan-Mullins, Urban, & Mang, 2017). However, there are a number

of negative repercussions that are not adequately addressed by financiers, dam builders or national governments (Tan-Mullins et al., 2017). For example, the Bui Dam in Ghana has flooded part of the national park, home to the black hippo, an endangered species (SOAS, 2015).

It is worth noting that hydropower dams are controversial regardless of funder. Consequently, key to investigating the environmental impacts of Chinese development investment in Africa will be distinguishing whether project impacts are because of the “Chinese” nature of the project, or because of the nature of the project itself (BenYishay et al., 2016). The World Bank used to be the biggest funder of hydropower projects in Africa but has become more selective in the projects it funds, due to social and environmental considerations. For example, it suspended funding to the Inga 3 dam in DRC due to concerns over the government’s project management arrangements (International Rivers, n.d.; Business Day, 2018). A consortium of Chinese SOEs and Spanish companies are now preparing a tender for the project following extensive negotiations with the government (Business Day, 2018). This example highlights the role of African government agency, suggesting that it is not necessarily that Chinese investments have inherently bad practices, but that they comply to host government standards, which may be weaker than international standards.

Differential Impacts by Company Size and Type

There are related claims within the literature that Africa’s relatively weaker environmental regulations have attracted firms from higher polluting sectors of China, and that China, which has a number of domestic environmental problems, is moving its high-polluting industries to Africa (Xiaoyang & Sun, 2016; Shinn, 2016). For example, Hebei Iron & Steel, China’s largest producer, is bringing a huge plant in South Africa online, and the Hebei provincial authorities hope to relocate large production amounts by 2023 (Shinn, 2016).

Xiaoyang and Sun (2016) argue that Chinese investments need to be examined more systematically in order to see not only whether environmental abuses are occurring, but in which sectors and why. Their study is based on interviews and field trips in Beijing and Africa. They argue that the level of negative environmental impact varies by industry and company attributes, including size and relationship with the Chinese government. Xiaoyang and Sun (2016) argue there is a divide between SOEs and small private businesses: the larger companies with capital over USD 10 billion (most of which are SOEs) pay more attention to socio-environmental issues, whereas smaller, private businesses often evade government control and pursue short-term profit at the expense of environmental and social impacts. Reasons for this include:

- SOEs have long-term horizons, so aim to create investment-friendly environments, as opposed to smaller companies which seek short-term profits.
- SOEs are more closely scrutinised by the authorities and the public, including Chinese embassies in the host country, and have internal controls related to socio-environmental issues, whereas smaller, private companies are more likely to solve problems on an ad hoc basis and are not inside the purview of the Chinese embassies or government commercial offices located in Africa (Xiaoyang & Sun, 2016).

What Can We Conclude?

Chinese-funded and constructed infrastructure projects and mines commonly have negative environmental and social impacts. A lack of comparative studies means it is hard to determine whether this is due to the fact that these projects are Chinese-funded or constructed,

or because of the nature of the projects themselves. It is possible that Chinese investment has become concentrated in sectors that impact the environment, such as hydropower and extractives, because China is more willing than other donors to fund or construct projects that have poor consideration of environmental and social standards.

Chinese Investment and Claims of Deforestation

Media reports have linked Chinese demand for timber with illegal logging and deforestation in Africa – for example, in the border area between Senegal and the Gambia (AsiaNews, 2016). Between 2000 and 2002, the Thanry Group were fined more than USD 1.3 million for violating forestry laws in Cameroon, including logging outside legal boundaries and in unallocated concessions (Shinn, 2016). Chinese investment and trade have been labelled a driver of deforestation, both in terms of land clearance for infrastructure projects/impacts of infrastructure projects and illegal logging and the timber trade (AsiaNews, 2016; Shinn, 2015). For example, increased demand from China for timber for Chinese furniture is one of the pressures on Miombo forest, which stretches across Mozambique, Zambia, Zimbabwe and Tanzania (Ekman, Wenbin, & Langa, 2013). Mineral prospecting activities by Chinese companies in forested areas in Zambia could also have negative impacts (Schoneveld et al., 2014). However, impacts may be due to the expansion of mining generally and not Chinese investment specifically, and outcomes are also likely to be conditioned by the capacity of the Zambian state to effectively manage and plan investment flows and put in place enforceable social and environmental safeguards (Schoneveld et al., 2014).

What Does the Evidence Tell Us?

A small body of rigorous, evidence-based literature addresses this narrative. BenYishay et al.'s (2016) study into the forest loss impacts of Chinese infrastructure projects merges geocoded project data from an AidData dataset with satellite images. Tanzania experienced faster rates of forest loss in areas near active projects (both infrastructure and social sector projects). However, areas under formal protection, i.e. protected areas, experienced little or no deforestation as a result of Chinese-funded projects. Consequently, domestic environmental governance and ecosystem protection measures play a crucial role in shaping forest cover outcomes (BenYishay et al., 2016).

Ekman et al.'s (2013) study of Chinese trade and investment in the Mozambican timber industry draws on field visits and key informant interviews. China is the only export market for Mozambican timber and the trade is largely operated by Chinese companies (Ekman et al., 2013). As Mozambique banned the export of logs in 2007 and Chinese demand centres on logs, the authors argue there are strong incentives for exporting timber illegally as logs, and the discrepancy in export/import statistics suggests there is a significant amount of illegally-exported timber going to China (Ekman et al., 2013). This case study is part of a wider review of Chinese forest practices in four countries that found Chinese companies have a tendency to violate local laws, including under-reporting export volume and smuggling raw logs (Shinn, 2016).

China has taken a number of steps in response to criticism of its activities in the forestry sector, including new voluntary guidelines in 2009 encouraging Chinese companies to manage, utilise, and protect overseas forests and meetings in Beijing with international forestry stakeholders to discuss the evidence (Shinn, 2016).

What Can We Conclude?

The evidence suggests that **Chinese demand for wood is linked to illegal logging and deforestation**. The impacts of projects funded by Chinese investment on **forest cover loss can be minimised by strong host country environmental governance** (BenYishay et al., 2016). However, the evidence base addressing this narrative is very small, making it difficult to draw a robust conclusion.

Chinese Investments and Environmental and Social Standards

A key issue raised in the literature is that China imposes lower environmental benchmarks on its aid and investment projects than multilaterals or Western companies (Wang & Zadek, 2016). Related to this is the narrative that Chinese companies ignore social and environmental impacts due to competitiveness and profitability, including gaining a competitive advantage over their Western counterparts (Wang & Zadek, 2016; Zeleza, 2014).

Related to this is the claim that African governments prefer Chinese investments, as the absence of aid conditionalities and lower social and environmental safeguards means projects can be implemented quicker (BenYishay et al., 2016). This could encourage African countries to “shop” their riskiest projects to China in order to ensure they are funded (BenYishay et al., 2016). However, BenYishay et al. (2016) argue that the evidence for these claims is limited and that debates persist because it has been difficult to subject the claim that Chinese-funded development projects cause large-scale environmental damage to rigorous empirical scrutiny.

What Does the Evidence Tell Us?

New Environmental Guidelines

China has become more and more concerned about negative economic and political consequences caused by reputational damage due to its firms' poor environmental practices in Africa (Xiaoyang & Sun, 2016). NGOs, including WWF, have expressed concern about the environmental implications of Chinese investment in Africa and environmental issues began to appear on the FOCAC agenda in 2006 (Tan-Mullins & Mohan, 2013; Shinn, 2016). The Chinese government, the Chinese policy banks and Chinese business associations have all issued new environmental guidelines motivated by reputational concerns, due to the increasing number of complaints (Xiaoyang & Sun, 2016; Alves, 2013).

Government-issued guidelines include:

- 2007: the State-owned Assets Supervision and Administration Commission of the State Council (SASAC) issued guidelines to SOEs on corporate social responsibility.
- 2008: agreement between the Chinese State Environmental Protection Administration and the International Finance Corporation to introduce the Equator Principles in China.
- 2009: the Ministry of Commerce and the State Forestry Administration published a guide on Sustainable Overseas Forest Management and Utilisation by Chinese Enterprises.
- 2013: the Ministry of Commerce and the Ministry of Environment Protection published the Environmental Protection Guide for Outbound Investment and Cooperation, which encourages companies to follow local environmental laws, assess the environmental risks of projects, minimise impacts on local heritage, comply with international standards

and draft procedures for handling emergencies, amongst others (Shinn, 2016, Alves, 2013; Xiaoyang & Sun, 2016).

Xiaoyang and Sun (2016) argue that these documents are all guidelines and are not legally-binding, as the assumption is that Chinese companies will abide by host country laws. However, this is problematic as environmental issues have a relatively low policy priority in Africa and regulation is not always well established, which has led to some companies exploiting loopholes (Xiaoyang & Sun, 2016; Shinn, 2016). For example, Shinn (2016) argues that there is inadequate implementation and enforcement in both Ethiopia and Zambia, as well as constraints due to human capacity and financial resources.

China Exim Bank and China Development Bank have adopted many of the same environmental safeguards as other major multilateral banks, including ex-ante and ex-post EIAs, project reviews, and compliance with host country environmental laws and regulations (BenYisay et al., 2016). Both banks also encourage Chinese contractors to undertake conservation activities to improve conservation outcomes (BenYishay et al., 2016) and are working with international counterparts to promote green finance and corporate social responsibility (CSR) (Wang & Zadek, 2016). The China-Africa Development Fund, created by China in 2007 to promote investment in Africa, was one of the first Chinese funds to insist on an environmental assessment for its investment projects (Zezeza, 2014). In 2008, China Exim Bank suspended funding for an iron mining and infrastructure construction project in Gabon over environmental concerns (Xiaoyang & Sun, 2016).

Chinese business associations, including the China International Contractors Association, and the China Chamber of Commerce of Metals, Minerals and Chemical Importers and Exporters, have issued guidelines for social responsibility: the latter was developed in collaboration with the OECD, DFID, GIZ and Global Witness (Xiaoyang & Sun, 2016; Shinn, 2016). A large number of Chinese enterprises are also seeking ISO certification and a small number of companies operating in Africa, including Sinopec in 2012, have signed the UN's Global Compact (Xiaoyang & Sun, 2016; Shinn, 2016).

Environmental concerns have also risen in prominence in the wider Belt and Road Initiative, with the Chinese Ministry of Environmental Protection issuing the Guidance Promoting Green Belt and Road and the Belt and Road Ecological and Environmental Cooperation Plan (Renwick et al., 2018). These follow the 2012 announcement of the Green Credit Guidelines for sustainable investment, which have been labelled "one of the most progressive sustainable finance policies in the world" by Friends of the Earth (cited in Renwick et al., 2018, p. 12).

However, it is important to remember that issuing guidelines is not an assurance of compliance or implementation. Shinn (2016) argues that until Chinese government-issued guidelines are made mandatory with penalties attached, it is unlikely they will change the behaviour of many companies. Capacity building of African environmental governance is also needed (Shinn, 2016).

SOEs Versus Private Companies' Compliance

SOEs with close ties to the national government account for 69% of Chinese foreign direct investment into Africa, whilst the remain 31% comes from private Chinese investment banks with government connections, sovereign funds like the China-Africa Development Fund, Chinese provincial and local governments, and small private companies and individual businesses (Shinn, 2016). There is some agreement within the literature that SOEs are working to improve environmental practices, whilst SMEs are resistant to change (Shinn, 2016). For example, a

2011 study of oil companies in Chad outlines that China National Petroleum Corporation, in response to criticism from home and abroad and keen to improve its reputation and keep access to reserves abroad, has paid increasing attention to environmental issues and has established a number of environmental protection measures (Wang & Zadek, 2016). Large Chinese companies are also paying growing attention to community development projects and there is evidence of individual companies building local facilities, donating to local causes, and sponsoring education in African countries (Wissenbach & Wang, 2017).

Weng and Buckley (2016) argue that the close relationship between SOEs and the government creates stronger incentives for compliance and that the Chinese government has severely limited influence over private businesses. Their discussion paper on the role Chinese policies and guidelines play in governing Chinese companies overseas draws on fieldwork in Mozambique, Kenya and Uganda in 2015, including a survey and interviews with 58 Chinese personnel working for Chinese companies. Findings include low awareness of Chinese policies and guidelines (in the construction and mining sector only 17% and 14% respectively reported familiarity with the content of sector-specific voluntary guidelines) and companies paying more attention to safety and labour policies than those related to social or environmental issues. Interviewees from SOEs reported higher levels of awareness and positive perceptions of guidelines than privately-owned companies (Weng & Buckley, 2016). Overall, interviewees identified host country laws and regulations as the most important factor guiding company operations, and interviewees showed high awareness of local environmental regulation requirements (Weng & Buckley, 2016). Project proprietor and financier conditions also have a critical influence on the operations of Chinese companies, particularly large-scale construction projects.

Tan-Mullins and Mohan's (2013) empirical study of Chinese SOEs' corporate environmental responsibility in Africa argues that their investment tends to be in environmentally sensitive sectors. Following growing pressure at home and abroad, Chinese SOEs are beginning to adopt CSR initiatives (Tan-Mullins & Mohan, 2013). However, there is slippage between stated intent and actual practice in Africa, with successful CSR limited by the willingness of Chinese SOEs to voluntarily abide by codes and the varying local socio-political structures and the composition of stakeholders at the local level (Tan-Mullins & Mohan, 2013). The tendency towards environmental protection is higher in contexts where non-state stakeholders exist and are empowered by legislation (Tan-Mullins & Mohan, 2013). It would be a myth to believe that Beijing has complete control over SOEs' activities abroad, and business imperatives tend to dominate operations at the local level (Tan-Mullins & Mohan, 2013).

Convergence Between Chinese and Western Standards

Many of the Chinese contractors who implement Chinese-funded infrastructure projects also work for the World Bank and others (BenYishay, 2016). Farrell's (2016) infrastructure quality study found environmental and social problems in only two of the 72 contracts analysed. Dollar (2016) argues that competitive pressure may therefore push Chinese firms to comply with international environmental standards and therefore improve the performance of Chinese-funded infrastructure projects. Xiaoyang and Sun (2016) argue that full convergence is unlikely, as the Chinese government has a different view to Western governments on the relationship between environment and development, but the Chinese government is willing to accept some international standards on environmental issues.

What Can We Conclude?

The Chinese government and Chinese companies are responding to the criticisms levelled against them by increasing CSR (Wang & Zadek, 2016; Zeleza, 2014; Shinn, 2016). There is some evidence that China is increasingly assessing the performance of its investments in terms of the sustainable development framework and is sensitive to criticisms of the impact of its investments. However, new guidelines are not mandatory, which may impact whether or not Chinese companies adhere to them. **It is important to distinguish between types of Chinese companies.** SOEs are regulated by China's Ministry of Commerce (Sautman & Hairong, 2014). Consequently, the government and actors such as the China Exim Bank are able to influence them more than privately owned companies.

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Key Websites

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- AIDDATA - <https://www.aiddata.org/datasets>