

Constructing Africa: Chinese Investment, Infrastructure Deficits, and Development

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Despite recent trends towards robust economic growth in many Sub-Saharan African countries, a number of challenges remain, including those emerging from persistent infrastructure deficits. China has emerged as a key partner to a number of African countries, including in financing and constructing large-scale infrastructure projects. China has become the dominant trading partner with Africa today, with bilateral trade and foreign direct investment (FDI) growing fourfold between 2001 and 2005. Relationships between China and African countries unfold in a context shaped by histories of relationships between African countries and external parties, particularly European former colonial powers, which have far too often been exploitative and unequal. These past interactions have been key elements in the construction of African infrastructure and institutions. Processes of construction of infrastructures in Africa, including institutions and a wide range of physical infrastructures, have been fundamentally incomplete in important respects, which has contributed to persistent poverty and instability in a number of African countries. As a result of past experiences, contemporary relationships between African countries and China are filtered through lenses shaped by past experience. The extent to which relationships with China will enable the development of more complete infrastructure construction in Africa is not yet fully apparent. The lessons of history, however, suggest that attention must be paid to processes of both deconstruction and construction that accompany external relationships, be they with China or other external powers.

Introduction	102
I. Sub-Saharan Africa Infrastructure Deficits: Infrastructure Investment in the Post-Colonial Era	108
A. China's Infrastructure Investments in Africa	108
B. Incomplete Construction	112
C. Physical Infrastructure Deficits in Africa	114
1. Water Resources and Sewage	116
2. Electricity	118

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3. Transportation and Logistics	119
4. Railways	121
5. Ports	121
6. Airports and Air Transit	122
7. Telecommunications Infrastructure	123
II. Reconstructing Africa: Reducing Infrastructure Deficits ...	124
A. Corruption, Institutions, and Infrastructure	124
B. Deconstructing Impediments to Robust Infrastructures .	127
C. Constructing New African Infrastructures	131
D. Financing Infrastructures	133
III. Assessing Chinese Infrastructure Deals in Africa	134
A. Questions and Issues Arising from China's African Infrastructure Investments	134
B. The Importance of Transactional Terms and Relationships	135
C. Constructing Relationships with External Powers: The Importance of Transparency	138
Conclusion	139

Introduction

In the early days of the twenty-first century, the seemingly robust economic prospects of countries in Sub-Saharan Africa drew global attention.¹ Some projections suggested that African countries would constitute a majority of the top ten countries in the world in terms of economic growth.² Economic growth projections in a number of Sub-Saharan African countries were considered as broad-based and evident in a number of sectors, including natural resources, land, agriculture, transport, manufacturing, financial intermediation, and tourism.³

Robust economic growth statistics have led some to predict a potentially rosy economic future for the continent.⁴ Indeed, recent economic growth statistics suggest that at least some negative post-colonial economic trends may be shifting.⁵ Although early twenty-first century economic growth has been driven to a significant degree by increases in commodity prices, this growth also reflects trends in Sub-Saharan Africa that are likely

1. IMF, WORLD ECONOMIC OUTLOOK APRIL 2013: HOPE, REALITIES, RISKS 67-69 (2013), <http://www.imf.org/external/pubs/ft/weo/2013/01>; CHARLES ROXBURGH ET AL., LIONS ON THE MOVE: THE PROGRESS AND POTENTIAL OF AFRICAN ECONOMIES 1 (2010), http://www.mckinsey.com/-/media/McKinsey/dotcom/Insights%20and%20pubs/MGI/Research/Productivity%20Competitiveness%20and%20Growth/Lions%20on%20the%20move%20The%20progress%20of%20African%20economies/MGI_Lions_on_the_move_african_economies_full_report.ashx.

2. *The Lion Kings?*, THE ECONOMIST (Jan. 6, 2011), <http://www.economist.com/node/17853324>.

3. This information is from McKinsey and reflects economic drivers for the fifteen countries in Africa that constitute eighty percent of African GDP. ROXBURGH, *supra* note 1, at 2.

4. *The Lion Kings?*, *supra* note 2.

5. *Id.*

to be sustainable, at least in part.⁶ These trends include growing urban middle class populations, as well as macroeconomic and other government policy changes that have promoted growth.⁷ In that sense, recent Sub-Saharan African economic growth figures underscore ways that changing policies can yield discernible results.⁸

At the same time, an economic slowdown in many African countries in 2015 and 2016 highlights both the potential limitations of future economic growth statistics as well as the reliance of many countries in Sub-Saharan Africa on exports of natural resources and, in some cases, trading and other relationships with China.⁹ Further, despite the existence of positive economic growth trends in many Sub-Saharan African countries, a number of challenges remain, some of which are related to persistent infrastructure deficits.¹⁰ It remains to be seen whether positive aggregate economic growth figures will be sustainable; will become a basis for ameliorating pervasive, persistent, and profound inequality within Africa; or will translate into improved economic and living conditions for the majority of the continent's population. Ultimately, the improvement of living conditions will depend to a significant degree on institutional frameworks and infrastructures within countries in the Sub-Saharan African region.¹¹ How the benefits of economic growth are to be shared among the populace remains a key issue and challenge in many African countries.¹²

In this era of seemingly robust economic growth prospects, China has become Africa's dominant trading partner.¹³ Bilateral trade and Chinese foreign direct investment (FDI) in Africa have grown fourfold between 2001 and 2005.¹⁴ Although this Article focuses on Chinese involvement in infrastructure projects in Africa, Chinese trade with—and investments in—Africa include a broad range of sectors, geographic locations, and investment structures.¹⁵ The relationships between China and African countries

6. Laura N. Beny & Lisa D. Cook, *Metals or Management? Explaining Africa's Recent Economic Growth Performance*, 99 AM. ECON. REV. 268, 268, 270 (2009); Acha Leke et al., *What's Driving Africa's Growth*, MCKINSEY Q. (June 2010), http://www.mckinsey.com/insights/economic_studies/whats_driving_africas_growth.

7. Leke, *supra* note 6.

8. *Id.*

9. Matina Stevis, *Sub-Saharan Africa's Economic Growth Rate to Stall in 2015*, WALL ST. J. (Apr. 13, 2015), <http://www.wsj.com/articles/sub-saharan-africas-economic-growth-rate-to-stall-in-2015-1428926411>.

10. BUILDING BRIDGES: CHINA'S GROWING ROLE AS INFRASTRUCTURE FINANCIER FOR SUB-SAHARAN AFRICA xi, xv (Vivien Foster et al. eds., 2009) [hereinafter BUILDING BRIDGES] ("Africa counts among its development challenges a major infrastructure deficit, with large investment needs and an associated funding gap.")

11. *Id.* at 31–32.

12. *Id.* at 32–33.

13. Frank Holmes, *China Has Just Crossed a Landmark Threshold*, VALUEWALK (Feb. 5, 2015), <http://www.valuewalk.com/2015/02/china-gdp-vs-usa/>.

14. BUILDING BRIDGES, *supra* note 10, at xii.

15. See, e.g., Deborah Brautigam, & Sigrid-Marianella Stensrud Exman, *Briefing: Rumours and Realities of Chinese Agricultural Engagement in Mozambique*, 111 AFR. AFF. 483, 483–84 (2012); Deborah A. Brautigam, & Tang Xiaoyang, *China's Engagement in African Agriculture: "Down to the Countryside"*, 199 CHINA Q. 686, 686 (2009); Joshua

unfold in a context shaped by a history of relationships between African countries and external parties—particularly former European colonial powers—which have far too often been exploitative and unequal.¹⁶ These past interactions have been key elements in the construction of Africa in time and space.¹⁷ China has positioned itself strategically and has sought to distinguish its relationships with African countries from prior unequal relationships, despite the reality of China's, at times, less than happy involvement in Africa.¹⁸ China's interests in Africa are at once political, economic, security-minded, and ideological.¹⁹

Regardless of one's view of the future economic prospects of African countries, a number of impediments to economic growth are readily apparent from even a cursory scrutiny of conditions within many African countries. Creating an environment for sustained and widespread economic growth and improved human conditions remains a key policy challenge in Sub-Saharan Africa.²⁰ Projected Sub-Saharan African population growth figures underscore the nature of this challenge: Africa is on the cusp of a baby boom that may see populations in many African countries double between now and 2050.²¹ In 2050, Africans will constitute an estimated twenty-five percent of the world's population, and thirty-seven African

Eisenman, *China-Africa Trade Patterns: Causes and Consequences*, 21 J. CONTEMP. CHINA 793, 793 (2012).

16. See Eisenman, *supra* note 15, at 808.

17. *Id.* at 809.

18. YUN SUN, AFRICA IN CHINA'S FOREIGN POLICY 2 (2014), http://www.brookings.edu/-/media/research/files/papers/2014/04/africa-china-policy-sun/africa-in-china-web_cmg7.pdf (noting that "Africa is seen to be part of the 'foundation' on which China's broader strategic ambitions are built . . . Sino-African relations have been relatively smooth and free of major disturbances, thanks to a shared sense of historical victimization by Western colonial powers and a common identity/affinity as developing countries. The nature of Sino-African ties is largely transactional and reciprocal."); Julia C. Strauss, *The Past in the Present: Historical and Rhetorical Lineages in China's Relations with Africa*, 199 CHINA Q. 777, 777-78 (2009) (noting that Chinese discourse concerning its involvement in Africa is framed as "positive, progressive and grounded in the eternal and principled truths of non-interference, mutual benefit, unconditionality, and special friendship and understanding towards Africa . . . [which] skates over some of the realities in which China has been rather less happily involved. These include supporting weak regimes and/or receiving leaders on the eve of their overthrow (Nkrumah in 1966); flagrantly (and covertly) arming and aiding presumptively revolutionary rebellions (Rhodesia/Zimbabwe, South-West Africa/Namibia, Guinea/Cape Verde, Cameroon, Congo, Algeria at different points from the early 1960s to the late 1970s) while publicly preaching non-interference and mutual benefit; engaging in grubby competition with the Soviet Union (notably Angola and Mozambique in the 1970s); and continuing to be entangled with regimes whose human rights records have come under widespread criticism (particularly Sudan and Zimbabwe) in the present.").

19. SUN, *supra* note 18, at 3.

20. BUILDING BRIDGES, *supra* note 10, at xv.

21. U.N. DEP'T ECON. & SOC. AFFAIRS, WORLD POPULATION PROSPECTS: THE 2012 REVISION 1 (2015), http://esa.un.org/unpd/wpp/Documentation/pdf/WPP2012_HIGH_LIGHTS.pdf; Stuart Burns, *What Will 2050 Look Like?*, METAL MINER (Jan. 18, 2012), <http://agmetalmminer.com/2012/01/18/what-will-2050-look-like-economic-growth-in-sub-saharan-africa/>; Elizabeth Rosenthal, *Nigeria Tested by Rapid Rise in Population*, N.Y. TIMES (Apr. 14, 2012), <http://www.nytimes.com/2012/04/15/world/africa/in-nigeria-a-preview-of-an-overcrowded-planet.html?pagewanted=all&r=0>.

countries will have doubled their population.²² This population increase could be the basis for a new era of African prosperity and economic transformation, or it could become a factor that precipitates yet more instability.

Policy approaches within many countries in Sub-Saharan Africa during the post-colonial period have led to practices and policies that have been—to a significant degree—redistributive in focus with a concentration on dividing a pre-existing economic pie rather than making the pie bigger.²³ These approaches have contributed to pervasive corruption and economic stagnation as various groups within countries in Sub-Saharan Africa have sought to gain a larger share of a fixed economic pie.²⁴ In recent years, a number of Sub-Saharan African countries have focused on more pro-growth strategies that seek to grow the economic pie.²⁵ These efforts, however, could be significantly enhanced by greater attention to institutional structures that inhibit economic freedom and reduce economic opportunities in Africa, particularly for those excluded from incumbent elite networks.²⁶ Of particular relevance are ways in which varied legal frameworks have played a continuing role in institutional structures and human outcomes in Africa.²⁷

In addition, many countries in Sub-Saharan Africa have significant linguistic, religious, ethnic, and other sources of diversity.²⁸ In much of the post-colonial era, this diversity has been a source of division and in some instances significant destruction.²⁹ Limited economic opportunities for many within African countries have further exacerbated such conflicts.³⁰

Existing discourse about contemporary Sub-Saharan Africa has paid significant attention to conditions in Africa and the economic, political, and other terms of Africa's engagement with external forces.³¹ Engagement with external forces, including between African countries and China,

22. MO IBRAHIM FOUND., *AFRICA AHEAD: THE NEXT 50 YEARS* 5 (2013), <http://static.moibrahimfoundation.org/downloads/publications/2013/2013-facts-&-figures-an-african-conversation-africa-ahead-the-next-50-years.pdf>.

23. See Benno J. Ndulo & Stephen A. O'Connell, *Governance and Growth in Sub-Saharan Africa*, 13 J. ECON. PERSP. 41, 53 (1999).

24. *Id.* at 55.

25. See SABINA DEWAN ET AL., *PATHWAYS TO INCLUSIVE GROWTH: 5 STEPS TO CREATE JUST JOBS IN AFRICA* 3 (July 2014), <http://justjobsnetwork.org/wp-content/pubs/reports/5-Steps-to-Create-Just-Jobs-in-Africa.pdf>.

26. *Id.* at 7.

27. See Ndulo & O'Connell, *supra* note 23, at 48.

28. INT'L ASSESSMENT OF AGRIC. KNOWLEDGE, SCI. & TECH. FOR DEV., 5 *AGRICULTURE AT A CROSSROADS* 40 (2009).

29. See William Easterly & Ross Levine, *Africa's Growth Tragedy: Policies and Ethnic Divisions*, 112 Q. J. ECON. 1203, 1206 (1997) (considering the impact of economic diversity on growth in Africa, noting that "high levels of ethnic diversity are strongly linked to high black market premiums, poor financial development, low provision of infrastructure, and low levels of education").

30. Chris Cramer, *The Economics and Political Economy of Conflict in Sub-Saharan Africa* 15 (Ctr. for Dev. Pol'y & Res., Paper No. 1099), <https://www.soas.ac.uk/cdpr/publications/papers/file24327.pdf>.

31. See, e.g., HOWARD FRENCH, *CHINA'S SECOND CONTINENT: HOW A MILLION MIGRANTS ARE BUILDING A NEW EMPIRE IN AFRICA* 4 (2014) (discussing Africa's economic and political engagement with China).

must be considered within the broader contexts of serious infrastructure deficits. As Howard French notes, maps highlight the scarcity of infrastructure networks in Africa:

The story [the maps] told, via a sparse assortment of colored or dotted lines representing Africa's transportation infrastructure, was not just how to get from one place to another, but how the continent was tied together—or not. The scarcity of the lines, sketched against a backdrop of immense yellow deserts, vast, green bands of forest that extended north from the coast in West Africa . . . spoke of much more than the mere hugeness of the terrain The important roads were drawn like veins, in bold crimson with black borders, and what was most striking about them was their paucity. Most of them had been laid down under European rule. Studying them, one quickly understood Europe's goal was extracting as much value as possible from Africa's land and from its peoples, and especially of making imperialism self-financing. There was little variation on direct mine-to-port routing for almost all the terrestrial infrastructure.³²

Existing infrastructure deficits in Africa are rooted in the construction of colonial territories and ensuing post-colonial states.³³ Comparing Africa with the rest of the world, particularly other countries in the developing world, underscores the extent to which Africa significantly trails the world in virtually every possible measure of infrastructural development.³⁴ Incomplete infrastructure construction has contributed to the high costs and poor safety record of the transport sector in Africa.³⁵ Underlying such physical infrastructure deficits are significant gaps in legal and other institutions, as well as persistent problems throughout Sub-Saharan Africa with the maintenance, management, and recreation of existing infrastructure and institutions.³⁶ This has led to deterioration and failed physical and other infrastructures.³⁷ In the case of railways, for example, infrastructure deterioration has been a consequence of varied factors, including insufficient financial and technical resources, and inability of countries to produce infrastructure inputs such as railway equipment, which had to be

32. *Id.* at 161–62.

33. KEN GWILLIAM, *AFRICA'S TRANSPORT INFRASTRUCTURE: MAINSTREAMING MAINTENANCE AND MANAGEMENT* 3 (2011), http://www-wds.worldbank.org/external/default/WDSContentServer/WDSP/IB/2011/04/08/000333037_20110408010210/Rendered/PDF/608030PUB0Afri10Box358332B01PUBLIC1.pdf.

34. *BUILDING BRIDGES*, *supra* note 10, at 30 (“Sub-Saharan Africa currently lags behind other developing regions on most standard indicators of infrastructure development This finding holds across a wide range of indicators including road density, paved road density, electricity generation capacity per capita, and household access to electricity, water, and sanitation.”).

35. GWILLIAM, *supra* note 33, at 6, 9 (noting that inland transport costs in Africa are higher than in any other region of the world and that “all modes of transport, in particular road and air, have extremely poor safety records”).

36. *Id.* at 14–15 (“Africa has inherited from its history a distorted and relatively poor transport infrastructure, which it has neither managed nor maintained well.”).

37. Douglas A. Kolozsvari, *Civil Society and the Protection of Sub-Saharan Africa's Colonial Railways: The Case of Madagascar's Fianarantsoa-Côte Est Railway 118* (2013) (unpublished Ph.D. dissertation, University of Michigan) (on file with author), http://deepblue.lib.umich.edu/bitstream/handle/2027.42/99911/dougkol_1.pdf?sequence=1&isAllowed=y.

imported.³⁸ Structural adjustment programs during the 1980s imposed strict controls on government spending, which also contributed to infrastructure deterioration.³⁹

Processes of construction of infrastructures in Africa have thus been fundamentally incomplete in important respects, which have contributed to persistent poverty and instability in a number of African countries.⁴⁰ The Millennium Development Goals—specific development goals with specific targets to be achieved by specific dates—are dependent in significant part on “improvements in economic infrastructure services.”⁴¹ As a result of past interactions, contemporary relationships between African countries and China are filtered through lenses shaped by past experience.⁴² The extent to which relationships with China will enable more complete infrastructure construction in Africa is not yet apparent. The lessons of history, however, suggest that attention must be paid to processes of both deconstruction and construction that accompany external relationships, be they with China or other external powers.

Infrastructure deficits may relate to a broad range of networked infrastructures.⁴³ Significant commentary exists concerning deficits in physical infrastructure in Africa. These deficits comprise inadequacies in water and sanitation infrastructures, transportation infrastructures (including road, rail, port, and air transportation networks), electricity infrastructures, and telecommunications infrastructures (including inadequate fixed-line telephones and broadband).⁴⁴ In addition to tangible infrastructures, a number of gaps are also evident in the management and governance realm, including with respect to legal institutions.⁴⁵ These governance infrastructure gaps may reinforce physical deficits and hinder their remediation. Further, many of the infrastructures created during and after the colonial period were not as transformative as they might have been, in

38. *Id.* at 73; G.H. Pirie, *The Decivilizing Rails: Railways and Underdevelopment in Southern Africa*, 73 *TJDSCHRIFT VOOR ECONOMISCHE EN SOCIALE GEOGRAFIE* 221, 223 (1982) (“... [R]ailway building in southern Africa set up relations of dependency on overseas financial institutions and sources of equipment and maintenance supply.”).

39. Kolozsvari, *supra* note 37, at 6-7.

40. *Id.* at 5.

41. CHRISTOPHER WILLOUGHBY, *INFRASTRUCTURE AND THE MILLENNIUM DEVELOPMENT GOALS 2* (2004), <http://www.oecd.org/dac/povertyreduction/36567911.pdf>; U.N. DEV. PROGRAMME, *INVESTING IN DEVELOPMENT: A PRACTICAL PLAN TO ACHIEVE THE MILLENNIUM DEVELOPMENT GOALS 7* (2005) (“Without basic infrastructure and human capital, countries are condemned to export a narrow range of low-margin primary commodities based on natural (physical) endowments, rather than a diversified set of exports based on technology, skills, and capital investments.”).

42. Luke Patey & Zhang Chun, *China, Trade, Aid, and Africa*, *FIN. TIMES* (Mar. 11, 2014), <http://www.ft.com/intl/cms/s/0/e05c6154-a90b-11e3-9b71-00144feab7de.html#axzz3qwTAcsuz>.

43. GWILLIAM, *supra* note 33, at 3-4 (noting that as a result of colonialism, transport networks were extensive in linking ports and distant sources rather than intensive in providing good network coverage within the territory).

44. See *infra* Part I.C.

45. See Courtney Hostetler, Note, *Going from Bad to Good: Combating Corporate Corruption on World Bank Funded Infrastructure Projects*, 14 *YALE HUM. RTS. & DEV. J.* 231, 232 (2014) (describing governmental corruption in various infrastructure projects).

part because their legacy was largely limited to the physical object itself.⁴⁶ In contrast, a legacy that included sufficient transfer of knowledge to facilitate better maintenance and recreation of new infrastructures at the local level could have been a basis for significant transformation of infrastructure capacity within African countries.

This Article considers China's investment activities in Africa in light of existing and pervasive infrastructure deficits. Part I discusses infrastructure investment in the post-colonial era, and the development and continuing implications of infrastructure deficits. Part II contemplates approaches that might assist in reducing existing deficits. Part III considers implications of Chinese infrastructure investments.

I. Sub-Saharan Africa Infrastructure Deficits: Infrastructure Investment in the Post-Colonial Era

A. China's Infrastructure Investments in Africa

Chinese activities in Africa are surprisingly controversial. From the perspective of many countries in the West, Chinese activities in Africa have been perceived as potentially exploitative and in support of repressive governments in a manner that had seemingly been reserved for those in the West.⁴⁷ Many of the objections of other powers to Chinese activities in Africa are fairly astonishing given the history of prior unequal and exploitative relationships between Africa and varied external powers.⁴⁸ More problematic, perhaps, is a potential tendency of countries within Africa to look to China as the latest external savior with insufficient African agency. Such countries fail to take sufficient steps internally to maximize returns from Chinese investments or undertake necessary internal reforms to ensure sustainability of infrastructure projects.⁴⁹ This is particularly true given concerns that emerged in 2015 concerning the potentially deleterious impact of an economic slowdown in China on its trading

46. See Lamido Sanusi, *Africa must get real about Chinese ties*, FIN. TIMES (Mar. 11, 2013), <http://www.ft.com/intl/cms/s/0/562692b0-898c-11e2-ad3f-00144feabdc0.html> (describing how China built infrastructure in Nigeria without transferring skills to local communities, and comparing this model to colonialism).

47. Patey & Chun, *supra* note 42.

48. See Koloszvari, *supra* note 37, at 13 (describing French exploitation of railway workers).

49. Sanusi, *supra* note 46. Sanusi explains:

So China takes our primary goods and sells us manufactured ones. This was also the essence of colonialism. The British went to Africa and India to secure raw materials and markets. Africa is now willingly opening itself up to a new form of imperialism This African love of China is founded on a vision of the country as a saviour, a partner, a model. But working as governor of Nigeria's central bank has given me pause for thought. We cannot blame the Chinese, or any other foreign power, for our country's problems. We must blame ourselves for our fuel subsidy scams, for oil theft in the Niger Delta, for our neglect of agriculture and education, and for our limitless tolerance of incompetence. That said, it is a critical precondition for development in Nigeria and the rest of Africa that we remove the rose-tinted glasses through which we view China.

Id.

partners in Africa.⁵⁰

Although Chinese investments in African infrastructure have received significant attention in recent years,⁵¹ Chinese economic engagement with Africa has lasted longer than many assume: China constructed the Tanzania-Zambia railway in the 1970s and had earlier engagements with Africa prior to the twentieth century.⁵² Further, China is not alone in undertaking significant investment activities in Sub-Saharan Africa, which is also receiving increasing funding from India,⁵³ the Gulf States, and Japan.⁵⁴ Chinese investments in Africa reflect an increasing flow of South-South investments.⁵⁵ Despite the significant attention paid to Chinese investment activities in Africa, to date China's investments in Africa represent a small fraction of its global investment activities.⁵⁶

In late January 2015, China entered into a Memorandum of Understanding (MOU) with the African Union to enhance and develop road, rail, and air transportation links in Africa.⁵⁷ The ambitious plans contemplated by the MOU (as described in media discussions of the MOU, which

50. Patrick McGroarty & Matina Stevis, *In Africa, Those Who Bet on China Face Fallout*, WALL ST. J. (Sept. 8, 2015), <http://www.wsj.com/articles/in-africa-those-who-bet-on-china-face-fallout-1441760196>; Rene Vollgraaff, *These Are the African Nations Most Exposed to China's Slump*, BLOOMBERG BUS. (Sept. 16, 2015), <http://www.bloomberg.com/news/articles/2015-09-17/these-are-the-african-nations-most-exposed-to-china-s-slump>; Summer Zhen, *South Africa Takes Measures to Tackle Fallout from China Slowdown*, S. CHINA MORNING POST (Sept. 20, 2015), <http://www.scmp.com/business/global-economy/article/1859944/south-africa-takes-measures-tackle-fallout-china-slowdown>.

51. Ching Kwan Lee, *The Spectre of Global China*, 89 NEW LEFT REV. 29, 29 (2014) (noting that "[China's] presence in Africa has drawn a vast amount of attention, despite the fact that [China] only accounts for a tiny fraction of foreign direct investment there—4 per cent for 2000–10, compared to 84 per cent for the Atlantic powers"); Wayne Ma et al., *China Offers Africa Billions in New Loans—Beijing, Seeking Stronger Economic Relations With the Resource-Rich Continent, Pledges to Address Trade Imbalances*, WALL ST. J. (July 20, 2012), <http://www.wsj.com/articles/SB10000872396390444464304577536140647257710>.

52. BUILDING BRIDGES, *supra* note 10, at 5; JAMIE MONSON, *AFRICA'S FREEDOM RAILWAY: HOW A CHINESE DEVELOPMENT PROJECT CHANGED LIVES AND LIVELIHOODS IN TANZANIA* 44 (2011); DAVID HAMILTON SHINN & JOSHUA EISENMAN, *CHINA AND AFRICA: A CENTURY OF ENGAGEMENT* 17 (2012).

53. Geeta Mohan, *India-Africa Summit: Modi Power Draws 40 Leaders*, THE SUNDAY GUARDIAN (Sept. 12, 2015), <http://www.sunday-guardian.com/news/india-africa-summit-modi-power-draws-40-leaders>.

54. BUILDING BRIDGES, *supra* note 10, at 66; Steve Booyesen, *South-South Partnerships: An African Recipe for Growth*, 8 GEO. J. INT'L AFF. 35, 35 (2007). See, e.g., Harry G. Broadman, *China and India Go to Africa—New Deals in the Developing World*, 87 FOREIGN AFF. 95 (2008); Dorothy McCormick, *China & India as Africa's New Donors: The Impact of Aid on Development*, 35 REV. AFR. POL. ECON. 73 (2008); Nicole Cassandra Naidoo, *Japan: The Biggest Asian Investor in Nigeria*, CNBCAFRICA (Mar. 23, 2015), <http://www.cnbcfrica.com/news/special-report/2015/03/23/japan-investment-deals-nigeria-asia/>.

55. Booyesen, *supra* note 54, at 35.

56. SUN, *supra* note 18, at 2 ("China's investment in and trade with Africa represents 3 percent and 5 percent of its global investment and trade, respectively. Politically, the continent is of small importance to China's foreign policy agenda, with Africa playing a largely supportive role in China's overall international strategy.")

57. AU, *China Agree Big Infrastructure Deal*, NEWS24 (Jan. 27, 2015), <http://www.news24.com/Africa/News/African-Union-China-agree-big-infrastructure-deal-20150127>.

as of mid-2015 had not yet been made public) will unfold in a context of significant Chinese investment and activity across a broad range of African infrastructure projects.⁵⁸ Many see China's investment in African infrastructure as a key element in future African economic growth and productivity.⁵⁹ Infrastructure projects are booming in Africa today,⁶⁰ and China is the largest bilateral investor in African infrastructure, with loans of \$13.4 billion in 2013.⁶¹ Infrastructure investments by China in Africa reflect a broader engagement by China with infrastructure investment globally;⁶² China has also been a motivating force in the development of the Asian Infrastructure Investment Bank (AIIB), which was created in 2014 to address infrastructure investment gaps in Asia.⁶³

Although the line between commercial and concessional financing arrangements may at times be difficult to determine, China has also been engaged in providing significant developmental assistance to Africa. Analysts disagree as to "the nature of China's official development aid, the countries that are its main recipients, the reasons for providing aid, the quantity of official aid, and its impact."⁶⁴ Further, as sociologist Ching Kwan Lee notes, use of the term "Chinese investment" "masks a hierarchy of capitals of varying status, resourcefulness and connection to the Beijing government."⁶⁵ Chinese investment may come from diverse sources that have varied investment goals and objectives;⁶⁶ investors may include cen-

58. See *China to Cooperate with Africa on Building Infrastructure Networks*, SHANGHAI DAILY (Sept. 21, 2015), http://www.shanghaidaily.com/article/article_xinhua.aspx?id=302861.

59. *Chinese Investment Key to Improving Infrastructure in Africa*, WORLD POL. REV. (Feb. 4, 2015), <http://www.worldpoliticsreview.com/trend-lines/15015/chinese-investment-key-to-improving-infrastructure-in-africa>.

60. Bradley Seth McNew, *It's Time to Invest in Africa—Here Are Some Ways to Get Started*, THE MOTLEY FOOL (Jan. 26, 2015), <http://www.fool.com/investing/international/2015/01/26/its-time-to-invest-in-africa-here-are-some-ways-to.aspx> ("Across the continent, including Sub-Saharan Africa, business and infrastructure projects are booming, prompting comparisons with China 20 to 30 years ago.").

61. LE CONSORTIUM POUR LES INFRASTRUCTURES EN AFRIQUE, TENDANCES DU FINANCEMENT DES INFRASTRUCTURES EN AFRIQUE—2013: RAPPORT ANNUEL DE L'ICA 40 (2014), http://www.icafrica.org/fileadmin/documents/Annual_Reports/ICA-2013-INFRA-FIN-TRENDS-AFRICA-2013-FINAL-WEB-FRENCH.pdf ("La Chine reste le pays qui investit le plus dans les infrastructures africaines. En 2013, les prêts ont atteint 13,4 Mrd \$, ce qui est comparable à 2012. Ils ont tous été dirigés vers l'Afrique sub-saharienne.").

62. Shannon Tiezzi, *China's \$1 Trillion Investment Plan: Stimulus or Not?*, THE DIPLOMAT (Jan. 8, 2015), <http://thediplomat.com/2015/01/chinas-1-trillion-investment-plan-stimulus-or-not/>.

63. *Why China is creating a new "World Bank" for Asia*, THE ECONOMIST (Nov. 14, 2014), <http://www.economist.com/blogs/economist-explains/2014/11/economist-explains-6>; Bree Feng, *Deal Set on China-Led Infrastructure Bank*, N.Y. TIMES (Oct. 24, 2014), <http://www.nytimes.com/2014/10/25/world/asia/china-signs-agreement-with-20-other-nations-to-establish-international-development-bank.html>.

64. Deborah Brautigam, *Chinese Development Aid in Africa: What, Where, Why, and How Much?*, in RISING CHINA: GLOBAL CHALLENGES AND OPPORTUNITIES 203, 203 (Jane Golley & Ligang Song eds., 2011), <http://www.american.edu/sis/faculty/upload/Brautigam-Chinese-Aid-in-Africa.pdf>.

65. Lee, *supra* note 51, at 34.

66. See Thomson Ayodele & Olusegun Sotola, *China in Africa: An Evaluation of Chinese Investment* (Initiative for Pub. Pol'y Analysis, Working Paper, 2014).

tral state-owned enterprises and policy banks, provincial state-owned enterprises, private companies, and entrepreneurial or family firms.⁶⁷ Chinese state capital comprises approximately half of the total Chinese investment in Africa.⁶⁸

The 2015 African Union MOU reflects patterns of China's engagement with infrastructure projects in Africa.⁶⁹ Although trade between China and Africa is not new,⁷⁰ in recent years, China has financed large-scale infrastructure projects throughout Africa.⁷¹ Chinese financing is provided primarily through the Chinese Export-Import Bank, at times on terms that are "marginally concessional, though significantly less so than those associated with [traditional overseas development aid]."⁷² Between January 2010 and May 2012, China approved concessional loans worth a total of \$11.3 billion for ninety-two African projects.⁷³ In 2007, China established the China-Africa Development Fund to encourage and support investment by Chinese enterprises in Africa.⁷⁴ The China-Africa Development Fund focuses on five different areas: agriculture, industrial parks, infrastructure, manufacturing, and mining and resources.⁷⁵ By 2013, the China-Africa Development Fund was managing some sixty projects in over thirty countries in Africa, with total investments in South Africa alone exceeding \$400 million by the end of 2012.⁷⁶

China also undertakes hybrid sovereign-commercial infrastructure investment transactions.⁷⁷ As of 2009, Chinese infrastructure investment was highly concentrated, with four countries (Nigeria, Angola, Ethiopia, and Sudan) receiving seventy percent of investments.⁷⁸ The two largest sectors benefitting from Chinese infrastructure investment were power and

67. Lee, *supra* note 51, at 34-35.

68. *Id.* at 35.

69. AU, *China Agree Big Infrastructure Deal*, *supra* note 57.

70. BUILDING BRIDGES, *supra* note 10, at 5-6 (describing Chinese aid provided to Africa since the 1960s, as well as Chinese trade with Africa along the Silk Road, including a visit to East Africa by a Chinese admiral in the fifteenth century); George Klay Kieh, Jr. & Edward Lama Wonkeryor, *China's Development Aid to Africa*, 7 INT'L STUD. J. 131, 131 (2010).

71. JEFFREY GUTMAN, AMADOU SY & SOUMYA CHATTOPADHYAY, FINANCING AFRICAN INFRASTRUCTURE: CAN THE WORLD DELIVER? 17 (Mar. 2015), http://www.brookings.edu/-/media/Research/Files/Reports/2015/03/financing-african-infrastructure-gutman-sy-chattopadhyay/AGIFinancingAfricanInfrastructure_FinalWebv2.pdf.

72. BUILDING BRIDGES, *supra* note 10, at xii.

73. INFO. OFFICE OF THE STATE COUNCIL, CHINA-AFRICA ECONOMIC AND TRADE COOPERATION 10 (Aug. 2013) [hereinafter CHINA-AFRICA COOPERATION], http://news.xinhuanet.com/english/china/2013-08/29/c_132673093.htm.

74. Yuan Li, *Guest Post: China Africa Development Fund in South Africa*, CHINA IN AFR.: THE REAL STORY (May 22, 2013), <http://www.chinaafricarealstory.com/2013/05/guest-post-china-africa-development.html>.

75. *Id.*

76. *Id.*

77. Suzanne Siu, *The Sovereign-Commercial Hybrid: Chinese Materials for Infrastructure Financing in the Democratic Republic of the Congo*, 48 COLUM. J. TRANSNAT'L L. 599, 602-03 (2010).

78. BUILDING BRIDGES, *supra* note 10, at xiv.

transport (primarily railroads).⁷⁹ In 2012, Chinese enterprises completed \$40.8 billion in construction contracts in Africa, a forty-five percent increase from 2009.⁸⁰ These contracts accounted for thirty-five percent of China's completed overseas contract work.⁸¹ Chinese companies are also playing a significant role in the transport sector in Nigeria and recently built the first modern tramway in Sub-Saharan Africa, which opened in Ethiopia in September 2015.⁸² China has also undertaken activities in the power sector, recently signing a nuclear power partnership transaction in Kenya.⁸³

China imports significant amounts of natural resources from Africa.⁸⁴ In 2009, China depended on Africa for some thirty percent of Chinese oil imports, eighty percent of cobalt imports, and forty percent of manganese imports.⁸⁵ A significant number of Chinese Export-Import Bank infrastructure financing deals make use of "resources for infrastructure" deal structures in which "repayment of the loan for infrastructure development is made in terms of natural resources—for example, oil."⁸⁶ As is the case in the recent MOU with the African Union, little public information is available concerning China's infrastructure deals with African countries, including the financial terms of Chinese Export-Import Bank transactions.⁸⁷

B. Incomplete Construction

Infrastructures are important determinants of social and economic development.⁸⁸ Infrastructures are also "the key technological and physical assets of modern cities" connecting urban societies through complex

79. *Id.* at xiii.

80. CHINA-AFRICA COOPERATION, *supra* note 73, at 7.

81. *Id.* at 8.

82. DELOITTE ON AFRICA, AFRICAN CONSTRUCTION TRENDS REPORT 2014 15 (2015), http://www2.deloitte.com/content/dam/Deloitte/za/Documents/manufacturing/za_africa_construction_trends_2015_10032015.pdf (noting that in Nigeria, "Chinese companies dominate the development of the transport network, particularly in the rail and airport sub-sectors"); *China in Driving Seat as Ethiopian Capital Gets New Tramway*, THE ECON. TIMES, (Sept. 20, 2015), http://economictimes.indiatimes.com/articleshow/49036659.cms?utm_source=contentofinterest&utm_medium=text&utm_campaign=cpst.

83. Press Release, Kenya Nuclear Electricity Board, Kenya Signs Nuclear Power Partnership Deal with China, <http://www.nuclear.co.ke/press-release/69-kenya-signs-nuclear-power-partnership-deal-with-china.html>.

84. Lee, *supra* note 51, at 36 (noting that "the Chinese Academy of Social Sciences, a key government think-tank, has identified resource security as the top priority for China-Africa economic strategy over the next ten years").

85. BUILDING BRIDGES, *supra* note 10, at xvi.

86. *Id.* at xvii. See, e.g., MARCUS POWER ET AL., CHINA'S RESOURCE DIPLOMACY IN AFRICA: POWERING DEVELOPMENT? (2012); Wenran Jiang, *Fuelling the Dragon: China's Rise and Its Energy and Resources Extraction in Africa*, 199 CHINA Q. 585 (2009); Indira Campos & Alex Vines, *Angola and China: A Pragmatic Partnership* 1-16 (Ctr. for Strategic & Int'l Studies, Working Paper, 2008).

87. BUILDING BRIDGES, *supra* note 10, at 58.

88. BRETT FRISCHMANN, INFRASTRUCTURE: THE SOCIAL VALUE OF SHARED RESOURCES xi (2014); César Calderón, *Infrastructure and Growth in Africa 2* (The World Bank, Pol'y Res. Working Paper No. 4914, 2009).

interdependencies.⁸⁹ Africa in particular boasts the highest urban growth rates in the world,⁹⁰ which has important implications for infrastructure development in Africa.⁹¹ From a broader perspective, infrastructures provide connectivity between urban spaces and “wider regional, national, and transnational networks.”⁹² As such, infrastructure encompasses both technical and cultural systems that “create institutionalized structures whereby goods of all sort circulate, connecting and binding people into collectivities.”⁹³

Infrastructure has played an important role in post-colonial Africa, where successive governments in varied countries have sought to build modern, interconnected nations.⁹⁴ Infrastructures not only reflect a technical process, but as anthropologist Brian Larkin suggests, “the provision of infrastructures” are works of state representation.⁹⁵ Infrastructure conceptualization and construction stand as pillars of the literal and figurative creation of modern African states during both the colonial and post-colonial eras.⁹⁶

Countries in Sub-Saharan Africa have significant infrastructure deficits as compared to other countries in the developing world.⁹⁷ The current poor condition of infrastructures throughout Sub-Saharan Africa is at least in part a consequence of processes that began during colonialism.⁹⁸ The urbanization in which infrastructures play such a critical role has also itself been significantly influenced by events during the colonial and pre-colonial eras that shaped patterns of institutional and societal construction within Africa.⁹⁹ Accordingly, infrastructure deficits are symptomatic of broader problems in processes of societal construction.¹⁰⁰ As a result, simply engaging outside parties to build infrastructure will not by itself fundamentally ameliorate conditions that have led to infrastructure deficits.¹⁰¹ Rather, new infrastructure projects must first take account of processes of incomplete construction that have contributed to existing conditions and

89. STEPHEN GRAHAM & SIMON MARVIN, *SPLINTERING URBANISM, NETWORKED INFRASTRUCTURES, TECHNOLOGICAL MOBILITIES AND THE URBAN CONDITION* 9-10 (2001).

90. Mthuli Ncube, *Urbanization in Africa*, AFR. DEV. BANK (Dec. 13, 2012), <http://www.afdb.org/en/blogs/afdb-championing-inclusive-growth-across-africa/post/urbanization-in-africa-10143/>.

91. Although African populations presently remain primarily rural, estimates suggest that urban populations will constitute a majority of the population in Africa by 2020. AFRICA'S INFRASTRUCTURE: A TIME FOR TRANSFORMATION 127 (Vivien Foster & Cecilia Briceño-Garmendia eds., 2010).

92. BRIAN LARKIN, *SIGNAL AND NOISE: MEDIA, INFRASTRUCTURE, AND URBAN CULTURE IN NIGERIA* 5 (2008).

93. *Id.* at 6.

94. *Id.*

95. *Id.* at 19.

96. Foster & Briceño-Garmendia, *supra* note 91, at 2.

97. *Id.* at 1.

98. *Id.*

99. TRISTRAM HUNT, *CITIES OF EMPIRE: THE BRITISH COLONIES AND THE CREATION OF THE URBAN WORLD* 8-9 (2014).

100. GRAHAM & MARVIN, *supra* note 89, at 10.

101. James Blignaut, *Fixing Africa's Problems*, 2 VRYE AFRIKAAN 1, 3-4 (2005).

then attempt to deconstruct such processes in order to reconstruct infrastructures in a more effective manner. Colonialism and imperialism involved processes of deconstruction and reconstruction.¹⁰² For example, the Atlantic and Arab slave trade during the pre-colonial era played a significant role in processes of deconstruction in Africa.¹⁰³ As a result, current conditions in African countries today may reflect the negative consequences of centuries of historical experience, including decades of colonialism and centuries of slave trade¹⁰⁴: “History lies heavy on Africa: the long decades of colonialism, several hundred years of the Atlantic and Arab world slave trade, and . . . countless centuries of indigenous slavery before that.”¹⁰⁵ Colonialism and the slave trade had a negative impact on African institutional development, networked connectivity, and relationships within African countries: “The enslavement of individuals had a devastating impact on the institutional development of the communities. Entire communities degenerated into predatory societies.”¹⁰⁶ The legal implications of this institutional deterioration are significant, particularly as legal systems in Africa were used to facilitate slavery: “An additional consequence of the slave trade was the perversion of the legal system into a tool for the enslavement of others. A non-trivial proportion (4-11 %) of slaves entered slavery through the judicial process.”¹⁰⁷ Processes of deconstruction and construction prior to, during, and following colonialism continue to have relevance to societal conditions within African nations.

C. Physical Infrastructure Deficits in Africa

Infrastructure in the colonial state was typically oriented towards the needs of colonial powers that controlled the colonial territory.¹⁰⁸ This meant that roads and other infrastructures were constructed within a colonial external extractive paradigm that focused on extracting resources for the benefit of the home country, but did not focus sufficiently on internal

102. LARKIN, *supra* note 92, at 25; DAVID SCOTT, *REFASHIONING FUTURES: CRITICISM AFTER POSTCOLONIALITY* 26 (1999) (discussing the relationship of colonialism with political forms of modernity, noting the emergence during colonialism of a form of power “not merely coincident with colonialism . . . concerned above all with disabling old forms of life by systematically breaking down their conditions, and with constructing in their place new conditions so as to enable—indeed, so as to *oblige*—new forms of life to come into being”).

103. Nathan Nunn, *The Long-Term Effects of Africa’s Slave Trades*, 123 Q. J. ECON. 139, 139-40 (2008).

104. *Id.*

105. ADAM HOCHSCHILD, *KING LEOPOLD’S GHOST: A STORY OF GREED, TERROR, AND HEROISM IN COLONIAL AFRICA* 300 (1998).

106. *Id.* at 139.

107. *Id.*; Walter Hawthorne, *The Production of Slaves Where There Was No State: The Guinea-Bissau Region, 1450-1815*, 20 SLAVERY & ABOLITION 97, 119 (1999) (noting that decentralized and stateless coastal groups produced slaves in a number of ways, including by “refashioning the judicial institutions that structured intra-group relations”).

108. GWILLIAM, *supra* note 33, at 3-4.

infrastructure development and networked connectivity.¹⁰⁹

The external extracting orientation of colonial infrastructure projects extended to all aspects of colonial construction processes.¹¹⁰ As historian Rudolf Mrázek notes with respect to a railroad construction project in Indonesia:

As late as the mid-1920s, even the rails for the Indies railways were imported from Europe . . . [a]s late as the early 1940s, to the end of the Dutch colonial era, virtually all technical equipment came from the West . . . Not a single clerk, station master, or machinist was a non-European.¹¹¹

Similar processes of construction were also evident in Africa, where railways, for example, were often built using forced and free labor.¹¹² Railways in Africa were constructed by European powers for various purposes, including consolidating political and military control, access to natural resources, and other factors relevant to their economic advantage.¹¹³

From the perspective of the local environment and local needs, colonial construction projects resulted in infrastructure that was not sustainable and that was also not capable of being recreated in the local environment;¹¹⁴ such projects often used external raw materials, designed systems largely with external input, and sourced network components externally, among other externally oriented activities.¹¹⁵ In contrast, infrastructure projects that focus on a broader conceptualization of infrastructure that encompasses processes of knowledge and needs of the local environment, may attempt to create local knowledge systems that enable appropriate maintenance, processes, and logistics for delivery of raw materials and management of large-scale projects, and spillovers, for example, from sourcing of local resources and raw materials.¹¹⁶ Attention to local needs and impact would enable a more complete construction process that could serve as an example for similar and dissimilar future infrastructure projects that could be transformative.

As a result of incomplete and externally oriented processes of colonial construction, at independence, existing infrastructure networks in Africa were not sufficiently targeted to meet the demands of developing economies and societies.¹¹⁷ During the post-colonial era, lack of capacity and

109. Kolozsvari, *supra* note 37, at 34; Joshua Dwayne Settles, *The Impact of Colonialism on African Economic Development*, 5 U. TENN. HONORS THESIS PROJECTS 7, 10, 11 (1996).

110. See Kolozsvari, *supra* note 37, at 5 (“Most railways built in [Sub-Saharan Africa] had some type of extractive purpose in mind.”).

111. RUDOLF MRÁZEK, *ENGINEERS OF HAPPY LAND: TECHNOLOGY AND NATIONALISM IN A COLONY* 10 (2002).

112. Kolozsvari, *supra* note 37, at 1.

113. *Id.*

114. *Id.* at 72-74.

115. See generally Settles, *supra* note 109.

116. See e.g., AFRICAN DEVELOPMENT BANK GROUP, *AT THE CENTER OF AFRICA’S TRANSFORMATION: STRATEGY FOR 2013-2022* 15 (2013), http://www.africaneconomicoutlook.org/fileadmin/uploads/aeo/2015/PDF_Chapters/AfDB__2013__At_the_Center_of_Af_ricas_Transformation_-_Strategy_for_2013-2022.pdf.

117. Kolozsvari, *supra* note 37, at 34.

persistent underinvestment by post-colonial states in Africa led to deterioration of infrastructures constructed during the colonial era and insufficient construction of new infrastructures.¹¹⁸ As a result, infrastructure deficits in some instances intensified during the post-colonial era.¹¹⁹

The infrastructure deficits readily apparent in maps of the African continent reflect this fundamentally incomplete nature of infrastructure construction, as well as the construction of the post-colonial African state itself.¹²⁰ Infrastructure deficits are most evident in the lack of physical infrastructures of varied types in Africa.¹²¹ In addition, the lack of networked infrastructure evident in maps of Africa has contributed to the economic isolation of countries in Sub-Saharan Africa.¹²² Infrastructure networks, or the lack thereof, are also an important element in incomplete regional integration in the continent.¹²³ Deficits are apparent in a broad range of infrastructures in Africa.

1. Water Resources and Sewage

Water infrastructure in Africa is not well developed, which has significant implications for human health and well-being. In 2008, an estimated fifty-eight percent of Africans had access to safe drinking water.¹²⁴ Hydro-power and irrigation are also not well developed: five percent of Africa's cultivated land is irrigated, while less than ten percent of Africa's hydro-power potential has been tapped.¹²⁵ Institutional frameworks for sanitation are fragmented throughout the continent, and a significant number of countries in Africa spend no more than \$1 per capita per year on sanitation.¹²⁶ In the developing world generally, an estimated ninety percent of sewage flows into waterways untreated,¹²⁷ which has significant implications for human health and the spread of diseases such as cholera.¹²⁸ In 2008, approximately fifty percent of the rural and urban population in

118. *Id.* at 118, 127-29.

119. *Id.*

120. See ANDERBHAN WELDE GIORGIS, NATION BUILDING, STATE CONSTRUCTION AND DEVELOPMENT IN AFRICA: THE CASE OF ERITREA 2 (2010).

121. John Mukum Mbaku, *Building Opportunities: Addressing Africa's Lack of Infrastructure*, in FORESIGHT AFRICA: TOP PRIORITIES FOR THE CONTINENT, 2013 22, 22 (Afr. Growth Initiative at Brookings ed., 2013).

122. BENNO NDULU ET AL., CHALLENGES OF AFRICAN GROWTH: OPPORTUNITIES, CONSTRAINTS AND STRATEGIC DIRECTIONS 89 (2007), http://siteresources.worldbank.org/AFRI/CAEXT/Resources/AFR_Growth_Advance_Edition.pdf.

123. ANTON EBERHARD ET AL., AFRICA'S POWER INFRASTRUCTURE: INVESTMENT, INTEGRATION, EFFICIENCY 83 (2007).

124. Foster & Briceño-Garmendia, *supra* note 91, at 271.

125. *Id.*

126. ELVIRA MORELLA ET AL., CLIMBING THE LADDER: THE STATE OF SANITATION IN SUB-SAHARAN AFRICA 6, 8 (2008), http://infrastructureafrica.org/system/files/BP13_Sanit_sect_maintxtnew.pdf.

127. *Water For All*, MIT, <http://12.000.scripts.mit.edu/mission2017/> (last visited Apr. 13, 2016) (noting that untreated wastewater "brimming with bacteria, viruses, and parasites," leads to an estimated 5 million deaths per year from waterborne diseases).

128. *Id.* (noting that the use of toilets is essential for containing the spread of cholera).

Africa continued to rely on traditional latrines, while forty-one percent and less than ten percent in rural and urban areas, respectively, were estimated to practice open defecation.¹²⁹

Water resource management in Africa faces a number of challenges, including high levels of hydro-climatic variability. Although the amount of water in Africa

is comparable to that in other regions of the world . . . rainfall across much of the continent is variable and unpredictable, both between and within years . . . Interannual rainfall variability in Africa, especially in eastern and southern Africa, is high. These regions experience year-to-year variations exceeding 30% around the mean, a rate much greater than the temperate climates in Europe and North America . . . High seasonal variability compounds these effects, causing droughts and floods. Runoff in Africa is extraordinarily low, only half that in Asia, Australia, Europe, and North America, despite having the same average precipitation. Low runoff coupled with high rainfall variability explains the unpredictable, and relatively low, seasonal and annual flows in many African rivers.¹³⁰

These climatic factors make management of water resources and construction of water infrastructures more difficult;¹³¹ climate change will require greater resiliency in management of water resources in Africa.¹³² Existing variability is likely to increase in the future as a result of climate change, which will also lead to significant temperature increases in Africa.¹³³ Desertification in the Sahel region of Africa is yet another challenge to the management of water resources that will be negatively affected by climate change.¹³⁴

Management of water resources is also complicated by the political and geographic legacy that has resulted in multiple countries sharing the same river basins. International river basins cover more than sixty percent of the continent, and virtually all the region's rivers cross several borders: the Nile crosses ten, the Niger crosses nine, the Senegal crosses four, and the Zambezi crosses eight.¹³⁵ Such shared water resources require cross-border investment and management of water infrastructure, and may be

129. MORELLA, *supra* note 126, at 8.

130. *Id.*

131. WORLD BANK SUSTAINABLE DEV. DEP'T, MAKING DEVELOPMENT CLIMATE RESILIENT: A WORLD BANK STRATEGY FOR SUB-SAHARAN AFRICA xvii, xxv (Oct. 30, 2009), http://siteresources.worldbank.org/INTAFRICA/Resources/ClimateChange-StrategyReport2010-Full_vNoImages.pdf.

132. *Id.* at xxv, 24 (“Africa has a very low level of economically developed infrastructure. There are few water control systems and little water storage capacity, despite relatively abundant resources. The transport, energy, information, and communication systems are also poorly developed, which may hinder adaptation efforts. Further, Africa’s rapidly urbanizing population is vulnerable due to poorly defined property rights, weak land-use planning, and informal settlements, frequently on land subject to erosion or flooding.”).

133. Foster & Briceño-Garmendia, *supra* note 91, at 271.

134. Symposium, *Land Degradation and Poverty*, Int’l Fund for Agric. Dev. Directorate-General for Dev. Coop. of the Min. of Foreign Aff., Italy, <http://www.fao.org/docrep/x5317e/x5317e01.htm>.

135. Foster & Briceño-Garmendia, *supra* note 91, at 272.

the basis of conflicts among countries that share water resources.¹³⁶

Water management institutions in many African countries “are weak and fragmented,”¹³⁷ which has an impact on management of rivers and other water resources, as well as sectors such as agriculture, for which access to water is critical:

Lack of water infrastructure and inadequate water management mostly affect the poor. Africa’s poverty is closely linked to its dependence on rain-fed subsistence farming Because subsistence agriculture is the dominant livelihood, rain-fall, droughts, and floods, combined with the weak marketing network and difficult physical access to many area [have a significant impact on food security].¹³⁸

Ineffective management of water resources has had a deleterious impact on water catchments in Africa, leading to “excessive soil erosion, increased costs of water treatment, rapid siltation of reservoirs, and disruption of water supplies, and decline in economic life.”¹³⁹ Monitoring of current hydrological systems is insufficient and hydrographic networks are “outdated or in need of rehabilitation in many countries.”¹⁴⁰ Further, “Africa also lags behind the rest of the world in the number of meteorological stations where data can be systematically collected for dissemination to users.”¹⁴¹

2. Electricity

In the electrical sector, a power crisis is evident in Sub-Saharan Africa, where electrical power is unreliable and where power generation capacity is the lowest of any region in the world: “[h]ousehold connections to the power grid are scarcer in Sub-Saharan Africa than in any other developing region.”¹⁴² Access and consumption of electricity have an impact on economic outcomes, including GDP levels.¹⁴³ The energy gap between Africa and the rest of the world is actually widening. A 2015 Africa Progress Panel Report notes that:

Fifteen years ago, per capita energy use in Sub-Saharan Africa was 30 per cent of the level in South Asia, now it is just 24 per cent and still falling It would take the average Tanzanian around eight years to consume as much electricity as an American uses in one month.¹⁴⁴

136. *Id.*

137. *Id.*

138. *Id.* at 274.

139. *Id.* at 275.

140. *Id.*

141. *Id.*

142. EBERHARD, *supra* note 123, at 1.

143. ANTONIO CASTELLANO ET AL., BRIGHTER AFRICA: THE GROWTH POTENTIAL OF THE SUB-SAHARAN AFRICA ELECTRICITY SECTOR 8 (2015), http://www.mckinsey.com/-/media/mckinsey/dotcom/insights/energy%20resources%20materials/powering%20africa/brighter_africa_the_growth_potential_of_the_sub-saharan_electricity_sector.ashx (“Countries with electrification rates of less than 80 percent of the population consistently suffer from reduced GDP per capita.”).

144. AFRICA PROGRESS PANEL, POWER PEOPLE PLANET: SEIZING AFRICA’S ENERGY AND

Prices for power in Sub-Saharan Africa are double that of other regions in the world,¹⁴⁵ while the combined power generation of the entire continent equals that of Spain (or Argentina if South Africa is excluded).¹⁴⁶ The widespread use of generators further increases the costs of electricity in Sub-Saharan Africa.¹⁴⁷ Access to electricity is similarly low relative to other developing countries: “[l]ess than 30 percent of the population of Sub-Saharan Africa has access to electricity, compared with about 65 percent in South Asia and more than 90 percent in East Asia.”¹⁴⁸ Excluding South Africa, Sub-Saharan Africa is the only region in the world where per capita consumption of electricity is declining.¹⁴⁹ The lack of electrical power generation and access to electricity is costly, and estimating using “the value of lost load or unserved energy, power outages in the countries in Sub-Saharan Africa constitute an average of 2.1% of GDP.”¹⁵⁰ The financing gap for electricity is estimated to be \$55 billion, or 3.4 percent of Africa’s GDP.¹⁵¹

3. *Transportation and Logistics*

Africa has the lowest national road density in the developing world, with 204 kilometers per 1,000 square kilometers of land area.¹⁵² One quarter of such roads are paved, as compared with a world average of 944 per 1,000 square kilometers, where more than half of such roads are paved.¹⁵³ Although road density in Africa per capita is slightly higher than levels in South Asia, and road density is high relative to GDP, overall road density in Africa is “less than 30 percent of the next-lowest region, South Asia.”¹⁵⁴

Paved road density in Africa significantly trails the world,¹⁵⁵ with significant capacity constraints being present in Africa:

The majority of roads have one lane in each direction, and where roads are wider, pedestrians and parked vehicles often take up one lane. Intersections are close together and are ill designed for turning. Service lanes are absent, pavement is deteriorating, and street lighting is minimal. Because traffic management is limited, accidents are frequent, with pedestrians accounting

CLIMATE OPPORTUNITIES—AFRICA PROGRESS REPORT 2015 16 (2015), http://www.africa.progresspanel.org/wp-content/uploads/2015/06/APP_REPORT_2015_FINAL_low1.pdf.

145. EBERHARD., *supra* note 123, at 1.

146. *Id.* at 2.

147. *Id.* at 7, 12.

148. *Id.* at 5.

149. *Id.* at 6.

150. *Id.* at 7.

151. AFRICA PROGRESS PANEL, *supra* note 144, at 16.

152. Foster & Briceño-Garmendia, *supra* note 91, at 212.

153. *Id.* at 212.

154. *Id.*

155. KEN GWILLIAM ET AL., AFRICA INFRASTRUCTURE COUNTRY DIAGNOSTIC: ROADS IN SUB-SAHARAN AFRICA tbl.1, 2 (2008), http://www-wds.worldbank.org/external/default/WDSContentServer/WDSP/IB/2010/06/18/000334955_20100618084412/Rendered/PDF/551050WP0p109210Box349439B01PUBLIC1.pdf.

for two-thirds of fatalities.¹⁵⁶

Limited road density is particularly evident in rural areas: “African rural communities have by far the lowest accessibility to an all-season road in the developing world . . . [Such] physical isolation prevents large areas of the continent from reaching their agricultural potential.”¹⁵⁷ Further, “only one-third of rural inhabitants live within 2 kilometers of an all-season road.”¹⁵⁸

Significant weaknesses exist in other areas of the African transport sector, including with respect to ports and logistics systems.¹⁵⁹ These weaknesses are in part a consequence of ineffective regulation of transport markets: “[r]egulation of these [transport] markets often remains obstructive rather than constructive,” which reduces efficiency and increases costs.¹⁶⁰ Similarly, transport logistics in Africa are made more difficult by a lack of logistics competence, as measured by factors such as “the efficiency of customs and other border agencies, the ease and affordability of arranging international shipments, the competence of the local logistics sector, the ability to track and trace shipments, and their timeliness.”¹⁶¹ Trucking industry cartels and dispatching practices contribute to high road freight tariffs in Sub-Saharan Africa.¹⁶²

Significant transport capacity limitations are also present within urban areas in Africa:

Africa’s rapidly growing cities face major mobility problems . . . Urban road density is low by developing-country standards . . . following the demise of large buses in many cities, myriad informal minibus operators largely dominate urban transport services. Services are costly, and availability is inadequate . . . Few countries capture sufficient financial resources to develop and maintain the urban road network.¹⁶³

Ineffective regulation, including overlapping “national, metropolitan, and municipal jurisdictions present serious institutional challenges”¹⁶⁴ and

156. *Id.*; PATRICIO V. MARQUEZ & JILL L. FARRINGTON, *THE CHALLENGE OF NON-COMMUNICABLE DISEASES AND ROAD TRAFFIC INJURIES IN SUB-SAHARAN AFRICA: AN OVERVIEW* 13 (2013) (noting that road traffic injuries (RTIs) and non-communicable diseases are major causes of death and disability in Sub-Saharan Africa, with Africa having the highest age-standardized mortality rates for injuries, including RTIs).

157. Foster & Briceño-Garmendia, *supra* note 91, at 212.

158. *Id.* at 211.

159. *Id.* at 203 (“Except in South Africa, inland transport and facilities are poorly aligned with port development.”). See also JOHN RIVERSON ET AL., *RURAL ROADS IN SUB-SAHARAN AFRICA: LESSONS FROM WORLD BANK EXPERIENCE* 1 (1991), <http://documents.worldbank.org/curated/en/1991/07/440100/rural-roads-sub-saharan-africa-lessons-world-bank-experience> (noting deficient rural transport capacity in Africa).

160. Foster & Briceño-Garmendia, *supra* note 91, at 203-05.

161. *Id.* (“Except for South Africa, Sub-Saharan African countries perform poorly not only on infrastructure quality, but also on all the main aspects of logistics competence.”).

162. *Id.* at 211-12.

163. *Id.*; GWILLIAM, *supra* note 33, at 17 (noting that road passenger transport has suffered from counterproductive fare regulation, particularly in urban areas, which has led to most service being provided by the self-regulated informal sector).

164. Foster & Briceño-Garmendia, *supra* note 91, at 211-12.

magnify existing infrastructure deficits.¹⁶⁵

4. Railways

Rail networks in Africa are “disconnected, and many are in poor condition.”¹⁶⁶ Few countries have invested in maintaining railway lines and most railway networks outside of South Africa still operate with original facilities: “[m]any structures and some of the track work are now over 100 years old. Many sections of track have deteriorated almost beyond repair.”¹⁶⁷ Further, “[v]arious conflicts and wars have rendered several rail sections unusable.”¹⁶⁸ Although railway master plans have “existed for over a century,”¹⁶⁹ railway lines remain disconnected.¹⁷⁰ Persistent underinvestment is a major factor in the poor condition of rail networks in Africa: “Few railways are able to generate significant funds for investment . . . investment has usually come from bilateral and multilateral donors. Almost all remaining passenger services fail to cover their costs, and freight service tariffs are constrained by road competition.”¹⁷¹

The poor condition of African rail networks is in part a consequence of bureaucratic constraints and reflects a significant colonial influence in patterns of railway development in Africa:

Railway development has followed a similar pattern in almost all African countries. Typically, isolated lines headed inland from a port to reach a trading center or a mine, and over time, a few branch lines were built. Many of the lines were state owned, but some were constructed as concessions or, in the case of some mineral developments, as part of a mining company’s operation. Although continental rail master plans have existed for over a century, most of the African network remains disconnected, operating within a single country or linking a port and its immediate regional hinterland Trade between African countries (other than to and from South Africa) has always been minimal, largely because of the similarity in the products exported, which suggests that interregional links would be lightly used even if they existed.¹⁷²

5. Ports

Despite significant growth in general cargo and containerized cargo transiting African ports,¹⁷³ a number of impediments constrain the development of port infrastructures in Africa: “many African countries are trapped in a vicious circle of high tariffs discouraging traffic and further increasing costs.”¹⁷⁴ Poor inland links, wasteful and costly port adminis-

165. *See id.*

166. *Id.* at 229.

167. *Id.* at 230.

168. *Id.* at 229.

169. *Id.* at 230.

170. *Id.*

171. *Id.*

172. *Id.*

173. *Id.* at 249 (noting that cargo passing through African public ports has trebled since the mid-1990s).

174. *Id.*

tration, and limited integrated land distribution systems with many ports being “poorly equipped and inefficiently operated”¹⁷⁵ are some of the challenges that hinder the development of port infrastructures.

6. Airports and Air Transit

In addition to being expensive, air transport in Africa suffers from the poorest safety record in the world.¹⁷⁶ In 2004, Africa experienced twenty-two percent of all accidents world-wide but only accounted for only 4.5 percent of sectors flown globally.¹⁷⁷ In 2006 African carriers lost 4.31 aircraft per million departures, far higher than worldwide levels of 0.65 aircraft per million departures.¹⁷⁸ In 2012, the African safety record worsened with 3.71 Western-built jet hull losses per million flights, up from 3.27 in 2011.¹⁷⁹ In 2013, of the estimated two hundred airlines operating in Africa, only thirty-eight met global safety standards.¹⁸⁰ Flying in Africa is estimated to be twelve times more deadly than flying in other regions of the world.¹⁸¹

Moreover, landing charges are high and traffic volumes are relatively low.¹⁸² Domestic and international routes in Africa “often remain protected, and many small, nonviable state-owned operations continue, particularly in southern Africa, that are protected at the expense of potential users of air transport.”¹⁸³ Substandard regulatory oversight, inadequate safety management systems, and deficient safety management systems contribute to Africa’s poor air transport safety record.¹⁸⁴ The poor safety records of Sub-Saharan African carriers are also consequences of administrative weaknesses, including limited oversight of operators, “poor pilot capabilities and weak safety administration rather than the age of aircraft.”¹⁸⁵ Although runways and terminal capacity are generally adequate in Africa, significant weaknesses exist in air traffic control and surveillance¹⁸⁶:

Air traffic control infrastructure in Africa is wanting, with the exception of airports in South Africa and Kenya. Addis Ababa uses no civilian radar, forcing extra distance and time separations between aircraft. In Malawi, as equipment has aged and become too expensive to maintain, surveillance has fallen into disrepair. Even when the equipment exists, radar procedures

175. *Id.*

176. *Id.* at 259–60 (noting that “Sub-Saharan African carriers have the world’s worst accident record”).

177. *Id.* at 263.

178. *Id.*

179. MO IBRAHIM FOUND., *supra* note 22, at 67.

180. *Id.*

181. Andrew Rosthorn, *Training for Total Control in African Skies*, NEW SECURITY LEARNING, <http://www.newsecuritylearning.com/index.php/feature/154-training-for-total-control-in-african-skies> (last visited Apr. 13, 2016).

182. Foster & Briceño-Garmendia, *supra* note 91, at 263.

183. *Id.* at 259–60.

184. *Id.* at 268.

185. *Id.* at 260.

186. MO IBRAHIM FOUND., *supra* note 22, at 67.

(and radar separations) are not always implemented. In Kenya, only the airport in Nairobi has full-time radar vectoring, while that in Mombasa switches to radar only if weather so demands. In Tanzania, Dar es Salaam's airport has a good radar installation, with a secondary radar range in excess of 200 miles, but has no radar vectoring because of a lack of radar-certified controllers.¹⁸⁷

Aircraft surveillance and communication to and from the ground is also limited; in certain areas of Africa aircrafts can fly for an hour or more without being able to make contact with the ground.¹⁸⁸ This lack of surveillance has significant consequences for search and rescue operations.¹⁸⁹ Aircrafts flying in Africa also receive limited information concerning weather: “[w]eather installations are . . . sparse, often relying on physical observation using manual techniques now commonly automated in the West.”¹⁹⁰ Furthermore, broadband infrastructure is not available in most airports in Africa.¹⁹¹

7. *Telecommunications Infrastructure*

Although the telecommunications sector in Africa is experiencing explosive growth, the number of fixed phone lines in Africa is significantly lower than elsewhere in the world, with an average of ninety-three main telephone lines per 1,000 workers in 2001–2005, as compared with 1,096 in Western Europe, and 796 in East Asia and the Pacific.¹⁹² The African fixed phone line numbers for 2001–05 represent more than nine times the figure in 1991–95.¹⁹³ Growth in the African telecommunications sector has led to a decline in fixed phone line infrastructure gaps, although the gap remains quite large.¹⁹⁴

Nevertheless, Africa has higher growth rates and greater digital mobile penetration than other developed countries do.¹⁹⁵ In fact, due to the non-existence and unreliability of fixed phone lines, mobile subscribers in Africa grew eighteen percent annually in the five years preceding 2013.¹⁹⁶ Many in Africa have gone from having no telephone or minimal fixed phone line service directly to digital mobile phones without experiencing analog mobile technology that preceded digital mobile technology in many

187. Foster & Briceño-Garmendia, *supra* note 91, at 267.

188. *Id.*

189. *Id.*

190. *Id.*

191. *Id.*

192. See Calderón, *supra* note 88, at 7–8.

193. *Id.* at 8.

194. *Id.*

195. See Jeffrey James, *Leapfrogging in Mobile Telephony: A Measure for Comparing Country Performance*, 76 *TECH. FORECASTING & SOC. CHANGE* 991, 992 (2009); Paul Kagame, President of Rwanda, Kari Taylor Compton Lecture, Massachusetts Institute of Technology (Sept. 18, 2008), <http://mitworld.mit.edu/video/604> (discussing the leapfrogging nature of mobile telephone technology in Africa, which has facilitated the development of businesses).

196. See GSMA, *SUB-SAHARAN AFRICA MOBILE ECONOMY 2013 10* (2013), http://gsmamobileeconomyafrica.com/Sub-Saharan%20Africa_ME_Report_English_2013.pdf.

areas of the world.¹⁹⁷ A 2007 report indicated that digital mobile phone subscriptions in Africa accounted for ninety-five percent of all mobile subscribers, and made up eighty-three percent of all phones.¹⁹⁸

Only one in ten households in Africa has internet access.¹⁹⁹ Fixed line broadband connections in Africa lag behind the rest of the world, as do internet protocol television (IPTV) numbers.²⁰⁰ Compared to over 44 million in East Asia, 13 million in North America, and over 28 million in Europe, Africa had 128,500 IPTV subscribers in the fourth quarter of 2014.²⁰¹ Broadband penetration in Africa is low, and eight of the ten countries with the lowest broadband penetration in the world are located in Africa.²⁰² Not surprisingly, digital broadband is more widespread in Africa.²⁰³ Although broadband backbone infrastructure in Africa has expanded in recent years,²⁰⁴ telecommunications backbone infrastructures remain limited in Africa.²⁰⁵ Estimates from 2013 suggest that ninety percent of calls between African countries are routed through Europe, which costs an estimated \$400 million annually.²⁰⁶

II. Reconstructing Africa: Reducing Infrastructure Deficits

A. Corruption, Institutions, and Infrastructure

The incomplete construction of state institutions and their legal frameworks are perhaps less tangible manifestations of the same processes that led to incomplete construction of physical infrastructures.²⁰⁷ Infrastructure networks and connectivity are about more than physical infrastructure. They also require other infrastructures, including infrastructure

197. See, e.g., Kagame, *supra* note 195.

198. The figures for Europe were ninety-two percent and sixty-eight percent respectively. Abi Jagun et al., *Mobile Telephony and Developing Country Micro-Enterprise: A Nigerian Case Study 2* (U. of Manchester, Inst. for Dev. Poly & Mgmt. Dev. Informatics, Working Paper No. 29, 2007), http://www.sed.manchester.ac.uk/idpm/research/publications/wp/di/di_wp29.htm.

199. U.N. BROADBAND COMM'N, BROADBAND FOR ALL 40 (2014), <http://www.broadbandcommission.org/documents/reports/bb-annualreport2014.pdf>.

200. Gareth van Zyl, *Why a Broadband Fibre-Infrastructure Boom Awaits Africa*, ITWEBAFRICA (Apr. 14, 2014), <http://www.itwebafrica.com/network/333-africa/232723-why-a-broadband-fibre-infrastructure-boom-awaits-africa#sthash.zXdA6xda.dpuf>.

201. *Id.*

202. Olusegun Abolaji Ogundeji, *As Africa Internet Penetration Lags, Experts Suggest Ways to Spur Broadband Growth*, PC WORLD (Oct. 8, 2014), <http://www.pcworld.com/article/2692172/as-africa-internet-penetration-lags-experts-suggest-ways-to-spur-broadband-growth.html>.

203. U.N. BROADBAND COMM'N, *supra* note 199, at 87.

204. COMMONWEALTH TELECOM. ORG., THE SOCIO-ECONOMIC IMPACT FOR BROADBAND IN SUB-SAHARAN AFRICA: THE SATELLITE ADVANTAGE 6, 11, 12, http://www.cto.int/media/research/projects/Socio-Economic_Impact_of_Broadband_The_Satellite_Advantage.pdf.

205. See *Extending Rural ICT Access in Africa: Background Paper—Session Three, Connect Africa Summit, Kigali, Rwanda, Oct. 26, 2007*, https://www.unido.org/fileadmin/media/documents/pdf/connect_africa_s3-background.pdf.

206. JABULANI DHLIWAYO, DEVELOPING A FIBRE OPTIC BACKBONE FOR AFRICA 1, 2 (May 2013), http://networks.jcbroadband.com/downloads/developing_fiber_backbone_for_africa.pdf.

207. Foster & Briceño-Garmendia, *supra* note 91, at 159.

management services, to manage and maintain infrastructures, and legal and regulatory frameworks to facilitate such connectivity.²⁰⁸ As a result, infrastructure investments must be accompanied by institution-building and reform that deconstructs existing impediments and constructs competencies in such a way as to foster continued renewal of infrastructure and institutions. At a minimum, principles of good governance that include mechanisms for transparency, accountability, and inclusiveness should be a key aspect of infrastructures to enable processes that facilitate more complete construction.

Entrenched corruption exists in contexts of large-scale infrastructure projects in Africa and elsewhere in the world.²⁰⁹ As a result, the extent and scope of corruption in connection with such projects may play a critical role in determining project effectiveness and success.²¹⁰ Any discussion of improving infrastructures and institutions in Africa must take account of the endemic corruption that exists in many African countries.²¹¹ Although corruption is certainly not unique to Africa and has been present in different contexts throughout the world,²¹² the levels and types of corruption in Africa are generally thought to be a significant impediment to the amelioration of existing political, economic, and social conditions.²¹³ Although public expressions of outrage against corruption and corrupt officials are increasingly common in Africa,²¹⁴ the roots and legacy of corruption cast a shadow over future economic, political, and social endeavors.²¹⁵

Corruption also plays an important role in the private accumulation by public officials in many African countries and has developed regardless

208. *Id.* at 221.

209. Courtney Hostetler, Note, *Going from Bad to Good: Combating Corporate Corruption on World Bank-Funded Infrastructure Projects*, 14 *YALE HUM. RTS. & DEV. L.J.* 231, 232 (2011).

210. *Id.* at 233.

211. J.P. Olivier de Sardan, *A Moral Economy of Corruption in Africa?*, 37 *J. MOD. AFR. STUD.* 25, 25 (1999) (noting the “rampant corruption affecting the totality of African countries”).

212. Simon Coldham, *Legal Responses to State Corruption in Commonwealth Africa*, 39 *J. AFR. L.* 115, 115 (1995) (noting that corruption was common during the colonial period in Africa and served to bolster the colonial system); Colin Leys, *What is the Problem About Corruption?*, 3 *J. MOD. AFR. STUD.* 215, 221 (1965) (discussing ways to analyze alleged cases of corruption); Herbert H. Werlin, *The Consequences of Corruption: The Ghanaian Experience*, 88 *POL. SCI. Q.* 71, 72 (1973) (noting that although corruption was blatant in nineteenth-century America, it did not apparently slow economic development).

213. Werlin, *supra* note 212, at 73, 76 (noting that corruption may be a greater cause for concern in emerging nations compared to the United States and other developed countries, and noting intensified inter-ethnic conflict in Ghana).

214. See Ernest Harsch, *Accumulators and Democrats: Challenging State Corruption in Africa*, 31 *J. MOD. AFR. STUD.* 31, 32 (1993).

215. See generally Dhaneshwar Ghura, *Tax Revenue in Sub-Saharan Africa: Effects of Economic Policies and Corruption* (Int’l Monetary Fund, Working Paper No. 98/135, Sept. 1998), <http://ssrn.com/abstract=882694> (considering the impact of corruption on the tax revenue base in Africa).

of a state's official ideology or overall economic approach.²¹⁶ Corruption is often associated with rent seeking and other non-productive economic activities.²¹⁷ Corruption is "inimical to democratic practice because it abhors, by its very nature, the open light of public scrutiny and control."²¹⁸ Corruption also serves to entrench established incumbent elites, who use government institutions as instruments of enrichment of members of politically dominant groups.²¹⁹ Corruption can also significantly limit entrepreneurial business and other activities that may enhance opportunities for people within Africa.²²⁰ Mo Ibrahim, Sudanese billionaire and founder of Celtel International, noted that he was able to avoid paying bribes in developing his mobile telecommunications company because "bureaucrats and others opening up the way for his company really believed they would not make money."²²¹

New governments in Africa frequently begin with anti-corruption drives.²²² Such drives are, however, frequently short-lived and "forgotten once the initial zeal for reform had faded or the new authorities themselves succumbed to temptation."²²³ In other instances, anti-corruption drives have been used to target political opponents.²²⁴ The endemic nature of corruption in Africa suggests that in addition to legal sanctions, which may not be effective,²²⁵ an approach that focuses on the nature of the relationships desired and that attempts to create incentives to foster such relationships may be fruitful.²²⁶ In addition, transparency in infrastructure projects, particularly in relation to key transactional terms, including eco-

216. Harsch, *supra* note 214, at 37; John Mukum Mbaku, *Bureaucratic Corruption in Africa: The Futility of Cleanups*, 16 CATO J. 99, 99 (1996), <http://www.cato.org/pubs/journal/cj16n1-6.html>.

217. Harsch, *supra* note 214, at 41; Mbaku, *supra* note 216, at 105 ("Throughout Africa, from Algeria to Zaïre, bureaucrats and politicians promote perverse economic policies, which while impoverishing most of society, provide concentrated and significant benefits to the national elites and interest groups.").

218. Harsch, *supra* note 214, at 32.

219. See Mbaku, *supra* note 216, at 105 ("Nigeria is not the only country in Africa in which the apparatus of government has become an instrument for the enrichment of members of the politically dominant group. South Africa, long regarded by many scholars in the West as a bastion of free enterprise in Africa, has for many years promoted laws that allowed the white majority to use the redistributive powers of the state to enrich itself while sentencing the black majority to perpetual poverty and deprivation.") (citations omitted).

220. See Harsch, *supra* note 214, at 41.

221. #1638 Mohammed Ibrahim, FORBES, <http://www.forbes.com/profile/mohammed-ibrahim/> (last updated Nov. 22, 2015); *Unleashing Entrepreneurship in Africa: Policy Choices Matter*, WORLD BANK (Apr. 30, 2010), <http://go.worldbank.org/X43ZMCEGK0> WorldBank.

222. Harsch, *supra* note 214, at 32.

223. *Id.*

224. See *id.* at 33.

225. John Macrae, *Underdevelopment and the Economics of Corruption: A Game Theory Approach*, 10 WORLD DEV. 677, 686 (1982) (suggesting that legal sanctions may not effectively reduce corruption which has its roots in the day-to-day operation of the society at all levels).

226. *Id.* (suggesting that calculated self-interest may be one way to reduce corruption in instances where corruption is endemic).

conomic and commercial ones, may be an important element in combating corruption.²²⁷

B. Deconstructing Impediments to Robust Infrastructures

Conditions in Sub-Saharan Africa demonstrate how institutional frameworks that have developed to date may exacerbate infrastructure deficits.²²⁸ This suggests that successfully addressing the infrastructure deficits in Africa will require attention to existing institutional paths and frameworks.²²⁹ This raises questions about not only institutions, but also about broader issues of governance and the fundamental legal relationships that institutions and policies are intended to promote. Governance in this context has been defined as the “traditions and institutions by which authority in a country is exercised.”²³⁰ As such, governance is a broader and more inclusive term than government and “refers to the general manner in which a people is governed [and] can apply to the formal structures of government as well as to the myriad institutions and groups which compose civil society in any nation.”²³¹

The institutions that might be needed to ameliorate infrastructure deficits are often considered in discussions of infrastructure in Africa.²³² What is often not considered sufficiently in such discussions are the legal structures that might be needed to accomplish such goals and the ways in which specific incentives can be built into the recommended institutional frameworks.²³³ Even if legal structures are discussed, the legal relationships that are sought and the structures of incentives necessary to create such relationships are often not sufficiently considered.²³⁴

Institutions that arose in the colonial era are still present and even predominant in some African countries.²³⁵ These institutions are reflected in legal and regulatory environments that have not fostered the develop-

227. See Harsch, *supra* 214, at 37.

228. Cf. Kenneth L. Sokoloff & Stanley L. Engerman, *History Lessons: Institutions, Factors, Endowments and Paths of Development in the New World*, 14 J. ECON. PERSP. 217, 224-28 (2000) (discussing how the path of institutional development affected relative growth among New World economies).

229. See DARON ACEMOGLU & JAMES ROBINSON, WHY NATIONS FAIL 404-27 (2012) (discussing how countries can change their economic path by altering their institutions).

230. Daniel Kaufmann, Aart Kraay & Massimo Mastruzzi, *Governance Matters III: Governance Indicators for 1996, 1998, 2000, and 2002*, 18 WORLD BANK ECON. REV. 253, 254 (2004) (noting that governance “includes the process by which governments are selected and replaced, the capacity of the government to formulate and implement sound policies, and the respect of citizens and the state for the institutions that govern economic and social interactions among them”).

231. CARTER CTR., PERESTROIKA WITHOUT GLASNOST IN AFRICA 4-5 (1989), <http://www.cartercenter.org/documents/1211.pdf>.

232. See ACEMOGLU & ROBINSON, *supra* note 229, at 404-14.

233. See, e.g., *id.*

234. See, e.g., *id.*

235. See, e.g., Joanna Stevens, *Colonial Relics I: The Requirement of a Permit to Hold a Peaceful Assembly*, 41 J. AFR. L. 118, 132-33 (1997).

ment of robust infrastructures.²³⁶ Without some process of deconstruction, at least some of these institutions may continue to impede the development of robust infrastructures. In the power sector, for example, significant challenges exist to attracting investment to hybrid power markets, arising from varied limiting factors, including the identity of those holding responsibility for power sector planning, procurement management processes, and investment allocation among state owned utilities and independent power producers.²³⁷

The use of un-deconstructed models of colonial-based legal relationships in Africa is also potentially made more difficult by the historical experiences of the slave trade and colonialism, which helped give shape to distinctive conditions in Africa that remain influential today.²³⁸ Much has been written concerning post-colonial African economic, political, and social conditions.²³⁹ Although decolonization brought independence to former colonies, “it did not, as a rule, change the underlying social and economic structures of their societies.”²⁴⁰ Consequently, although authoritarian in nature,²⁴¹ the colonial state, as a legally constituted and administered state, became a basis for post-independence legal structures.²⁴² Colonial rule, however, significantly impaired a fluid transition to post-independence democratic rule;²⁴³ colonial governments focused on having minimal colonial administration and sought to make colonial territories self-governing.²⁴⁴ As a result, education was typically handled by Christian missionaries and economic activities by commercial companies.²⁴⁵ The colonial powers saw little need for rapid development:

In much of Africa, therefore, the colonial imprint was barely noticeable In northern Nigeria, Frederick Lugard set out to rule 10 million people with a staff of nine European administrators and a regiment . . . consisting of 3,000 African troops under the command of European officers.²⁴⁶

British indirect colonial rule in northern Nigeria reflected a particular emphasis on retaining “traditional” rulers in a way that served to

236. See, e.g., ACEMOGLU & ROBINSON, *supra* note 229, at 245-73 (discussing how colonialism often resulted in “reversing development”).

237. EBERHARD, *supra* note 123, at 79-80.

238. See ACEMOGLU & ROBINSON, *supra* note 229, at 368.

239. See, e.g., *id.*

240. Yash Ghai, *The Role of Law in the Transition of Societies: The African Experience*, 35 J. AFR. L. 8, 8 (1991).

241. *Id.*; James S. Read, *Studies in the Making of Colonial Laws: An Introduction*, 23 J. AFR. L. 1, 6 (1979) (noting that colonial subjects were scarcely consulted at all in the process of colonial law-making).

242. Ghai, *supra* note 240, at 8 (noting that despite its authoritarianism, the colonial state “was a legally constituted and administered state”).

243. Barry Munslow, *Why Has the Westminster Model Failed in Africa?*, 36 PARLIAMENTARY AFF. 218, 224 (1983) (“Colonial rule was by no means a preparation for post-independence democratic government. It was extremely hierarchical, at best paternalist and at worst authoritarian.”).

244. MARTIN MEREDITH, *THE FATE OF AFRICA: A HISTORY OF FIFTY YEARS OF INDEPENDENCE* 5 (2005).

245. *Id.*

246. *Id.*

strengthen and solidify the power of such rulers, while at the same time creating a distinct governance structure that continues to be a basis for division and conflict in Nigeria today.²⁴⁷

The legacy of former European colonial powers in Africa “was not democracy as it is practiced today in countries like England, France, and Belgium; it was authoritarian rule and plunder.”²⁴⁸ Current conditions in many parts of Africa today are in part a consequence of circumstances and laws that were created during and prior to the colonial era.²⁴⁹ In the political sphere, for example,

Africa inherited liberal democracy . . . from the accelerated and panicky process of rapid decolonization. It was only in the last decade of colonialism, when independence became a certainty, that the imperialist powers gradually began to institute democratic reforms in what had hitherto been structures of exploitation, despotism, and degradation.²⁵⁰

It is not surprising that such models disintegrated rapidly.²⁵¹ What was left following such disintegration was characterized by few successes that were often “precarious, temporary, and crippled by . . . class and ethnic limitations.”²⁵² The failures were “egregious, massive, and tragic,” and any remaining civil liberties “fragile, vulnerable, and under constant threat of death.”²⁵³ This fragile and precarious state reflects the extent to which institutional structures to support liberal democracy customized to fit the African political and economic reality did not emerge to a significant degree in Africa in the post-colonial era.²⁵⁴ This is often interpreted as a matter of failed institutions and institutional frameworks, and the fault often attributed to Africans, sometimes interpreted as failures in competence and capacity.²⁵⁵ The factors underlying failed African political and economic models, however, are quite complex and rooted in the historical experiences of African countries, both with respect to colonialism,²⁵⁶ as well as the slave trade and pre-colonial institutions.²⁵⁷ Needless to say,

247. LARKIN, *supra* note 92, at 21–25.

248. HOCHSCHILD, *supra* note 105, at 300.

249. See, e.g., STEVENS, *supra* note 235, at 133 (discussing contemporary legal treatment of questionable laws of colonial or other origin).

250. Robert Fatton, Jr., *Liberal Democracy in Africa*, 105 POL. SCI. Q. 455, 457 (1990) (discussing the emergence of modern authoritarianism in Africa).

251. *Id.* at 458.

252. *Id.* at 459.

253. *Id.*

254. See generally *id.* at 249.

255. Munslow, *supra* note 243, at 219 (“When failures took place like a collapsing house of cards, reasons were sought in the Africans’ unpreparedness for democracy, with a reversion to the traditional systems.”).

256. See James Robinson, *States and Power in Africa by Jeffrey Herbst: A Review Essay*, 40 J. ECON. LIT. 510, 512 (2002) (“Africa is different because the structural conditions that led to the path of state formation and institution building in Europe were absent in Africa.”).

257. ACEMOGLU & ROBINSON, *supra* note 229, at 102–04; Daron Acemoglu et al., *The Colonial Origins of Comparative Development*, 91 AM. ECON. REV. 1369, 1370 (2001) [hereinafter Acemoglu, *Colonial Origins*] (using settler mortality rates to demonstrate that colonies with higher European mortality rates are today substantially poorer than

fragile and unstable states may not be best positioned to engage in infrastructure construction or renewal.²⁵⁸ Furthermore, colonialism itself may have created an environment of governance within colonies in Africa in which nepotism and incompetence were rewarded, while “merit and achievement were irrelevant.”²⁵⁹

Recent empirical studies suggest that state legitimacy in African countries today may be partially dependent on the congruence between pre- and post-colonial political structures.²⁶⁰ In many regions of Africa, this congruence was significantly influenced by the commercial and other activities undertaken by European companies and governments prior to the colonial era, including slave trading, which led to significant political fragmentation in large swathes of Sub-Saharan Africa prior to the formal creation of African colonies at the Conference of Berlin in 1884-85.²⁶¹ The Conference of Berlin has been described as “the biggest Monopoly game in history.”²⁶² The divisions made at the Conference of Berlin were based on inaccurate, little, or no information.²⁶³

The consequences of such divisions and the colonial policies that followed were, however, profoundly important for present conditions in Sub-

colonies that were healthier for Europeans, suggesting that in colonies where Europeans settled, colonial powers established different institutional frameworks as contrasted at the other extreme with “extractive” institutional models exemplified in the Belgian Congo); Daron Acemoglu et al., *Reversal of Fortune: Geography and Institutions in the Making of the Modern World Income Distribution*, 117 Q. J. ECON. 1231, 1279 (2002) (noting that European colonization led to institutional reversal and a reversal in relative incomes among countries that were relatively rich in 1500 that are now relatively poor).

258. ACEMOGLU & ROBINSON, *supra* note 229, at 88.

259. LARKIN, *supra* note 92, at 22-23. See KWASI KWARTENG, GHOSTS OF EMPIRE: BRITAIN'S LEGACIES IN THE MODERN WORLD 8 (2012).

260. Pierre Englebert, *Pre-Colonial Institutions, Post-Colonial States, and Economic Development in Tropical Africa*, 53 POL. RES. Q. 7, 14 (2000) (noting that congruence between pre-colonial and post-colonial political structures is an important determinant of state legitimacy in Africa today).

261. RUTH WATSON, ‘CIVIL DISORDER IS THE DISEASE OF IBADAN’: CHIEFTAINCY AND CIVIC CULTURE IN A YORUBA CITY 4 (2003) (noting the disruption and political turmoil in contemporary southwestern Nigeria from the 1820s onward, connected to the combination of the collapse of the Oyo Empire, the expansion of the Sokoto Caliphate, and the prohibition and disruption of the Atlantic slave trade); A.G. Hopkins, *Economic Imperialism in West Africa: Lagos, 1880-92*, 21 ECON. HIST. REV. 580, 586-875 (1968) (noting that the slave trade led to civil disorder and inter-state warfare, and encouraged the rise of a warrior class that exerted significant influence over the policies of Yoruba states, including Ibadan, which was formed as a war camp); Nathan Nunn & Leonard Wantchekon, *The Slave Trade and the Origins of Mistrust in Africa*, 107 AM. ECON. REV. 3221 (2011); Nunn, *supra* note 103, at 139.

262. NIALL FERGUSON, EMPIRE: HOW BRITAIN MADE THE MODERN WORLD 233 (2003) (noting that “[t]he biggest game of Monopoly in history was about to begin. Africa was the board”).

263. MEREDITH, *supra* note 244, at 1. Meredith explains:

The maps used to carve up the African continent were mostly inaccurate; large areas were described as terra incognita. When marking out the boundaries of their new territories, European negotiators frequently resorted to drawing straight lines on the map, taking little or no account of the myriad traditional monarchies, chiefdoms and other African societies that existed on the ground. New boundaries cut through some 190 culture groups.

Id.

Saharan Africa. In fact, “[S]ub-Saharan Africa has the largest concentration of arbitrary postcolonial states, with little or no embeddedness into precolonial institutions and preexisting norms of political authority, [and] its economic performance tends to be weaker even after controlling for other variables known to differ between Africa and other regions.”²⁶⁴ The colonial power under which a country was formed may also have an influence on post-colonial economic performance.²⁶⁵

Further, states with greater legitimacy among developing countries have significantly better economic performance and have grown at five times the rate of states with less legitimacy.²⁶⁶ Legitimacy plays an important role in the development of effective institutional frameworks that were so important in the economic development of Europe, for example, as well as the construction of robust infrastructures.²⁶⁷ Political circumstances in much of Africa are closely linked to Africa’s continuing economic troubles.²⁶⁸

C. Constructing New African Infrastructures

Although the importance of good governance and institutional frameworks is generally acknowledged,²⁶⁹ such frameworks may be treated as a black box.²⁷⁰ Consideration of institutional structures under-

264. Pierre Englebert, *Solving the Mystery of the AFRICA Dummy*, 28 *WORLD DEV.* 1821, 1822 (2000).

265. Robin Grief, *Colonial Legacies and Economic Growth*, 98 *PUB. CHOICE* 317, 326-28 (1999) (noting that former French colonies in Africa have poorer economic performance, and finding that duration of colonization and British colonization are positively correlated with education, indicating that the British left a more educated population in Africa after colonialism).

266. Englebert, *supra* note 260, at 22-23.

267. Daron Acemoglu, Simon Johnson & James Robinson, *The Rise of Europe: Atlantic Trade, Institutional Change and Economic Growth*, 95 *AM. ECON. REV.* 547, 550, 561-62 (2005) (noting that the post-1500 economic development of Europe was facilitated by the indirect institutional consequences of the Atlantic trade, which included the development of political institutions that limited and constrained state power, as well as direct profits from colonization and slavery associated with this trade).

268. Michael Bratton, *Beyond the State: Civil Society and Associational Life in Africa*, 41 *WORLD POL.* 407, 409 (1989) (noting that political and economic crises in Africa are interrelated and that a “self-perpetuating cycle of change” exists in which “weak states engender anemic economies whose poor performance in turn further undermines the capacity of the state apparatus”); John Ravenhill, *Africa’s Continuing Crises: The Elusiveness of Development*, in *AFRICA IN ECONOMIC CRISIS* 1, 2 (John Ravenhill ed., 1986) (noting that per capita incomes might fall below certain levels at the time of independence, and the welfare gap between Africa and the rest of the world has widened).

269. *See supra* Part II.A.

270. *See* Acemoglu, *Colonial Origins*, *supra* note 257, at 1395 (noting that institutions are treated as a “black box” in their analysis). *But see* Oliver F. Williamson, *The Economics of Governance*, 95 *AM. ECON. REV.* 1, 15 (2005) (noting that the economics of governance have helped make economists focus on the importance of institutions, and that it is no longer acceptable to treat governance “as someone else’s bailiwick . . . to assume transactions costs are zero,” or uncritically “to ascribe innate monopoly purposes to nonstandard contractual practices and organizational structures”); Kenneth W. Dam, *Institutions, History and Economic Development* 1 (U. of Chicago Law & Econ., Olin Working Paper No. 271, 2006), <http://ssrn.com/abstract=875026> (discussing ways in

lying markets and economic institutions has been a subject of consideration by a broad range of economists and social scientists.²⁷¹

In African contexts, widespread patronialism has been a significant impediment to economic performance in many countries.²⁷² At least in part as a consequence of such forces, governing powers in Africa have tended to serve quite narrow clienteles.²⁷³ This suggests that institutions that reflect deleterious patterns of incentives and relationships have become imbedded in the post-colonial African context. How best to change such institutions remains a subject of significant discussion and comment.²⁷⁴

Some commentators recommend rule of law as the way with which best to confront Africa's authoritarian history.²⁷⁵ What constitutes rule of law and how rule of law can be implemented remains a continuing question. Further, crafting new institutions on top of existing patterns of relationships with incentives that may be contrary to the goals of such new institutions is unlikely to be successful.²⁷⁶ The development of functional institutional frameworks is key to Africa's achieving sustained economic growth in the future.²⁷⁷ An institution can be defined as "a public system of rules which defines offices and positions with their rights and duties, powers and immunities, and the like, [which] specify certain forms of actions as permissible, others as forbidden."²⁷⁸ An institution can be also thought of as an abstract object or as "a possible form of conduct expressed by a system of rules."²⁷⁹

Discussions about the infrastructure deficits often focus on creating institutional frameworks within which to accomplish stated goals.²⁸⁰ One evident strategy focuses on identifying institutions in other contexts, particularly in the West, that played an important role in the development of infrastructure.²⁸¹ Recognition of the key role played by institutions in

which the developing world can attain rule of law by looking at how countries in today's developed world did so).

271. See, e.g., ADAM SMITH, *THE WEALTH OF NATIONS* (1776); HERNANDO DE SOTO, *THE OTHER PATH: THE INVISIBLE REVOLUTION IN THE THIRD WORLD* (1989); HERNANDO DE SOTO, *THE MYSTERY OF CAPITAL* (2003).

272. Fatton, *supra* note 250, at 459.

273. Paul Collier & Jan Willem Bunning, *Explaining African Economic Performance*, 37 J. ECON. LIT. 64, 66 (1999) (noting that African governments have served narrow constituencies and as a result behaved in ways damaging to the long-term interests of a majority of their populations).

274. See, e.g., Ravenhill, *supra* note 268, at 1.

275. See Larry Diamond, *Building a Democratic Africa*, HOOVER DIG. (July 30, 1998), <http://www.hoover.org/research/building-democratic-africa> (advocating a constitutional framework that facilitates the limitation, separation, and devolution of power).

276. Collier & Bunning, *supra* note 273, at 105 (explaining that serving narrow constituencies allows governments to stay in power and disregard economic decline).

277. See *id.*

278. JOHN RAWLS, *A THEORY OF JUSTICE: REVISED EDITION* 47-48 (1999).

279. *Id.*

280. See, e.g., Ravenhill, *supra* note 268, at 1-3.

281. See, e.g., Diamond, *supra* note 275.

other contexts is important.²⁸² Further, the development of such institutions, which include educational frameworks and structures that support the development of private sector participants, may aid African countries in adopting institutional frameworks that can be a basis for construction of robust infrastructures.²⁸³ Imported institutional frameworks also reflect the sociocultural and historical contexts in which they developed, which means that translating such institutions into new contexts is not always an easy endeavor.²⁸⁴

Any consideration of the development of institutions in Africa should give greater attention to incentives and the ways in which such incentives should be restructured to achieve better outcomes. Examining institutions in this light can help bring attention to three key factors: the nature of the relationships that such institutions are intended to foster, the ways to create incentives to promote the development of desired patterns of relationships, and the potential for hybrid institutions that may incorporate particular local configurations or combine elements of what might be distinct institutions in other contexts. Consequently, such hybrid institutions may mediate existing dichotomies in other contexts, including in public, private, individual, and collective contexts. Such mediation and modification may take different shapes in particular local contexts. Local contextualization may also help in the development of institutions based on alternative templates that reflect social, political, and cultural conditions that exist in Africa. The ultimate goal of such institutions would be to transcend the limitations of models translated from other contexts, and to supplement or replace approaches to existing policy initiatives.

D. Financing Infrastructures

Chinese investment in African infrastructure projects has occurred in many instances after persistent underinvestment in infrastructures in a wide range of African countries and infrastructure sectors.²⁸⁵ In the power sector, for example, prolonged underinvestment in new generation capacity is a significant factor in the current power crisis in Sub-Saharan Africa.²⁸⁶

Chinese investment cannot and should not substitute African invest-

282. *See id.*

283. *See, e.g.,* Ravenhill, *supra* note 268, at 1-3.

284. MARTIN CHANOCK, *LAW, CUSTOM, AND SOCIAL ORDER: THE COLONIAL EXPERIENCE IN MALAWI AND ZAMBIA* 224 (1995) (discussing the adoption during colonialism of African legal systems in Malawi and Zambia based on British law); Adebambo Adewopo, *The Global Intellectual Property System and Sub-Saharan Africa: A Prognostic Reflection*, 33 U. TOL. L. REV. 749, 749-50 (2002) (noting that legal structures of most African countries reflect legal frameworks of colonial laws and legal systems).

285. *See generally* Foster & Briceño-Garmendia, *supra* note 91; *supra* Part I.A, C.

286. EBERHARD, *supra* note 123, at 12, 16 (“chronic power problems—including insufficient investment in generation capacity and networks, stagnant or declining connectivity, poor reliability, and high costs and prices (which further hinders maintenance, refurbishment, and system expansion)—have created a power crisis in Sub-Saharan Africa”).

ment in the development of African infrastructure.²⁸⁷ Existing infrastructures and institutional frameworks that have encouraged significant capital flight have impeded investment by Africans in infrastructure and other needed areas.²⁸⁸ Capital flight reflects a continuation of the external extractive paradigm that was a key aspect of colonial policy.²⁸⁹ Capital outflows from Africa deprive the continent of significant pools of financing that could be used to finance infrastructure and other critical needs.²⁹⁰ Between 1970 and 2008, an estimated \$854 billion to \$1.8 trillion in illicit financial flows (IFFs) left Africa.²⁹¹ Growth in IFFs exceeded economic growth figures with a growth of 11.9 percent per year over these thirty-nine years.²⁹² A 2015 report suggested that African countries are losing more than \$50 billion annually due to IFFs.²⁹³ An estimated eighty-two percent of Sub-Saharan African GDP flowed outside of Africa during this time period.²⁹⁴ Many of these funds have been placed in tax havens or developed countries.²⁹⁵ West and Central Africa accounted for \$494.0 billion (thirty-seven percent), North Africa for \$415.6 billion (thirty-one percent), and Southern Africa for \$370.0 billion (twenty-seven percent), with Nigeria, Egypt, and South Africa leading regional outflows.²⁹⁶

III. Assessing Chinese Infrastructure Deals in Africa

A. Questions and Issues Arising from China's African Infrastructure Investments

Some have criticized Chinese investment activities in Africa as potentially exploitative on account of a perceived inattention to human rights concerns.²⁹⁷ China's need for energy and natural resources drives Chi-

287. See *id.* at 170.

288. See generally CAPITAL FLIGHT FROM AFRICA: CAUSES, EFFECTS, AND POLICY ISSUES (S. Ibi Ajayi & Léonce Ndikumana eds., 2015); LÉONCE NDIKUMANA & JAMES K. BOYCE, AFRICA'S ODIUS DEBTS: HOW FOREIGN LOANS AND CAPITAL FLIGHT BLEED A CONTINENT (2011).

289. See NDIKUMANA & BOYCE, *supra* note 288, at 55; Acemoglu, *Colonial Origins*, *supra* note 257, at 1376 (explaining different colonization policies, such as "extractive states").

290. See generally NDIKUMANA & BOYCE, *supra* note 288 (explaining the principle of capital flight and its impact on African countries).

291. Casey Sahadath, *Illicit Financial Flows and Capital Flight in Africa*, E-INT'L REL. STUDENTS: STUDENT ESSAYS (Feb. 14, 2014), <http://www.e-ir.info/2014/02/14/illicit-financial-flows-and-capital-flight-in-africa/>.

292. *Id.*

293. U.N., Econ. Comm'n for Afr., *Illicit Financial Flows: Report on the High Level Panel on Illicit Financial Flows from Africa*, 13 (Feb. 2015), <http://www.uneca.org/publications/illicit-financial-flows>.

294. *Id.*

295. *Capital Flight from Africa*, U.N. ECON. COMM'N FOR AFR.: MEDIA CTR. (Apr. 7, 2014), <http://www.uneca.org/stories/capital-flight-africa>.

296. AFR. DEV. BANK & GLOBAL FINANCIAL INTEGRITY, *ILLICIT FINANCIAL FLOWS AND THE PROBLEM OF NET RESOURCE TRANSFERS FROM AFRICA: 1980-2009* 1, 3 (2013), http://www.glintegrity.org/storage/gfip/documents/reports/AfricaNetResources/gfi_afdb_iffs_and_the_problem_of_net_resource_transfers_from_africa_1980-2009-web.pdf.

297. Uche Ofodile, *Trade, Aid and Human Rights: China's Africa Policy in Perspective*, 4 J. INT'L COM. L. & TECH. 86, 89-90 (2009).

nese investment in Africa to a significant degree—in 2005, for example, thirty percent of China’s total oil imports originated in Africa.²⁹⁸ Critics suggest that China’s quest for African natural resources has led to an inattention to human rights considerations, and a support of dictators and repressive regimes.²⁹⁹ China’s activities have also been characterized as undermining efforts to isolate rogue governments.³⁰⁰ Chinese arms sales to Africa are also significant; for example, they constituted ten percent of arms transfers between 1996 and 2003.³⁰¹ Criticisms have been particularly acute regarding Chinese activity in Sudan, where the Darfur genocide occurred amid significant Chinese engagement with the Sudanese government.³⁰² Chinese activities may even contribute to the development of rogue states.³⁰³

At least some Chinese activities may undermine the processes under which robust institutions and infrastructures are constructed.³⁰⁴ Investment and other projects funded by China could be implemented in a manner to counter criticism by focusing on activities that promote development and on the construction of sustainable infrastructures that benefit a broader segment of the population.³⁰⁵ The development of such sustainable infrastructures would be consistent with the long-term nature of Chinese engagement in Africa considering the timeline of China’s infrastructure activities and investments.³⁰⁶

B. The Importance of Transactional Terms and Relationships

Although the construction of infrastructure can provide clear short-term benefits given the widespread nature of infrastructure deficits in Africa, the benefits of Chinese infrastructure investments for Africa may be difficult to evaluate comprehensively in the short-term.³⁰⁷ The extent to

298. *Id.* at 88–89.

299. *Id.* at 89–90.

300. *Id.* at 90.

301. *Id.* at 91.

302. *Id.* at 92.

303. WENJIE CHEN ET AL., WHY IS CHINA INVESTING IN AFRICA? EVIDENCE AT THE FIRM LEVEL 1, 3, 7–8 (Aug. 2015), <http://www.brookings.edu/-/media/research/files/papers/2015/08/why-china-is-investing-in-africa/why-is-china-investing-in-africa.pdf> (noting that Chinese investment “is indifferent to those governance measures, with the result that the countries where China’s investment share is large tend to be ones with weak governance”); Roudabeh Kishi & Clionadh Raleigh, *Chinese Aid and Africa’s Pariah States* (ACLED Working Paper, 2015), http://www.acleddata.com/wp-content/uploads/2015/03/ACLED_Working-Paper_Chinese-Aid-paper_final.pdf; Lee Mwiti, *China Does Not Support Rogue African States, It Creates Them—New Study Says*, MAIL & GUARDIAN AFR. (Apr. 9, 2015), <http://mgafrica.com/article/2015-04-07-china-does-not-support-rogue-african-states-it-creates-them-insteadnew-study>.

304. Ofodile, *supra* note 297, at 95 (noting that “China can promote purposeful, people-centered, sustainable development in Africa”).

305. *Id.* at 95 (suggesting that China “refrain from undermining human rights initiatives in the continent” and “strive to play a constructive role in the renaissance of Africa, not undermine it”).

306. *See id.* at 87, 95 (explaining China’s Africa policy as “a view to promoting the steady growth of China-Africa relations in the long term”).

307. *See* SUN, *supra* note 18, at 30.

which a significant long-term benefit is realized within Africa will depend to a large degree on the terms and conditions by which Chinese-funded infrastructure projects are undertaken. It will also depend on the extent to which African countries learn from such projects and the degree to which such learning extends beyond the provision of unconnected pieces of physical infrastructure.³⁰⁸ Infrastructure deficits encompass more than a dearth of physical structures, but also reflect deficiencies in critical intangible elements; these may include an insufficient management of available resources, failures in provision of related services, and inadequate legal and regulatory frameworks.³⁰⁹ Simply constructing new physical structures cannot fill such gaps. Filling such gaps will require the development of logistical, management, business, legal, and regulatory services and institutions that will enable maintenance and reconstruction of infrastructures developed or funded by China.³¹⁰

As a result, key questions to be considered in assessing the potential impact of Chinese investment and activities in Africa include: the extent to which the need for infrastructure networks are recognized, economic and other transactional terms, the extent to which capacity building is incorporated in project planning and implementation, how infrastructure projects are to be managed during the construction and post-construction phases, the quality of infrastructure projects being managed, the extent to which transactional terms are benchmarked against global standards (both in financial terms and construction standards), the negotiation processes connected to the infrastructure project, and the extent to which principals on the African side have the capacity and experience to negotiate the proposed project.³¹¹ Finally, despite the fact that Chinese-funded projects may have a concessionary element, the amount of debt being undertaken in connection with such projects will play a role in project success.³¹²

The construction of the TAZARA railway between Zambia and Tanzania, which was completed in the mid-1970s, may give some indication of the ways in which Chinese infrastructure projects may or may not resemble infrastructure financing by other external powers.³¹³ The railway, which enabled land-locked Zambia to avoid shipping copper through white-ruled Southern Rhodesia,³¹⁴ reflected a somewhat different development vision rooted in a vision of African regionalism espoused by President Julius Nyerere of Tanzania and President Kenneth Kaunda of Zambia.³¹⁵ Although Tanzania and Zambia sought financing from Western sources and the World Bank, their requests were denied. Their

308. *Id.*

309. *Id.* at 95.

310. *See id.* at 30.

311. *See* Mark Bohlund & Tom Orlik, *China's Road to Africa Lifts Investment, Adds Debt Risk*, BLOOMBERG PROFESSIONAL (June 18, 2015), <http://www.bloomberg.com/professional/blog/chinas-road-to-africa-lifts-investment-adds-debt-risk/>.

312. *See* MONSON, *supra* note 52, at 1-2.

313. *See id.* at 2.

314. *See id.*

315. *Id.* at 15, 21.

requests were denied because these funding sources thought the project was based on a political, rather than economic, rationale.³¹⁶

China, which sought to counter Soviet and American influences in Africa, initiated the project and undertook what was at the time the third largest infrastructure project in Africa.³¹⁷ China's funding of the TAZARA railway reflected China's "Eight Principles of Foreign Economic and Technological Assistance,"³¹⁸ which "were designed to [allow China to] compete simultaneously with the 'imperialists' (the United States) and the 'revisionists' (the Soviet Union) for Africa's approval and support China used its foreign aid to Africa as an instrument to advance China's political interests."³¹⁹

China offered generous terms of credit for the railway.³²⁰ The construction process included attention to the creation of knowledgeable local employees through worker training that focused on "teaching by example," which led to the creation of a "cohort of experienced African railway specialists who continued to work until retirement."³²¹ At the same time, the construction of TAZARA bore significant resemblance to earlier projects by European colonial powers.³²² For example, China provided rolling stock (rail cars), locomotives, steel rails, signaling equipment, and other materials, although cement sleepers and poles were produced in workshops in Tanzania.³²³ China provided engineering and construction expertise, and an estimated 15,000 to 50,000 workers during the project.³²⁴ In the end, construction of TAZARA led to more limited self-reliance, skills development, and training than anticipated, which have been a factor in continuing TAZARA performance difficulties since the time of its construction.³²⁵

Patterns of interaction between Africans and Chinese during the TAZARA project have continuing relevance today. Significant segregation existed in TAZARA work camps, as well as a perception that Chinese workers were reluctant to interact with Africans.³²⁶ The reluctance of Chinese workers in Africa to interact with Africans continues to be an issue of concern in a number of countries and has been a source of continuing contro-

316. *Id.* at 6.

317. *Id.* at 2, 26-29.

318. Strauss, *supra* note 18, at 786 (noting that the eight principles include "China's commitment to equality and mutual benefit to help the economies of friendly emerging countries, strictly respecting sovereignty, training the personnel of the host country to master the new equipment, and perhaps most of all, directing the Chinese technicians sent to Africa to have only the same standard of living as experts in the host country"); Zhou Enlai Announced Eight Principles of Foreign Aid, CHINA DAILY (Aug. 13, 2010), http://www.chinadaily.com.cn/china/2010-08/13/content_11149131.htm. See MONSON, *supra* note 52, at 29.

319. SUN, *supra* note 18, at 4.

320. MONSON, *supra* note 52, at 30.

321. *Id.* at 9.

322. *Id.* at 16-17.

323. *Id.* at 32.

324. *Id.* at 32-33 (noting that 30,000 to 40,000 Chinese teams worked on the project during the intensive construction years between 1970 and 1974).

325. *Id.* at 100-06.

326. *Id.* at 56-64, 150.

versy, which is not surprising in light of racial bars and other exclusionary racial practices that were characteristic features of European colonialism in many countries.³²⁷

Past experience with external powers suggests that attention must be paid to the terms and manners of engagement with any infrastructure construction project. To be truly transformative, such projects must transform the broader environment surrounding the infrastructure project, not just build a physical object. Without attention to this wider environment, in the absence of broader local transformation, Chinese constructed infrastructure projects will likely deteriorate in the same manner as earlier European ones.

C. Constructing Relationships with External Powers: The Importance of Transparency

Some commentators express concern that Chinese infrastructure and other investment activities in Africa will “perpetuate endemic public corruption.”³²⁸ Although China has taken steps that suggest that it may assist in fighting corruption within Africa,³²⁹ Chinese companies have faced allegations of corruption related to contracts awards in a number of countries in Africa.³³⁰ Public disclosure of the nature and terms of activities of Chinese and other investors in Africa could greatly facilitate transparency. Such transparency may help minimize opportunities for corruption in connection with large-scale infrastructure projects. The type of secrecy surrounding China’s recent MOU with the African Union and other infrastructure projects does not contribute to an environment of greater transparency.³³¹ Greater transparency in infrastructure projects may assist in providing an environment in which sustained and robust infra-

327. See Murithi Mutiga, ‘No Africans’ Chinese restaurant owner arrested in Nairobi, *THE GUARDIAN* (Mar. 24, 2015), <http://www.theguardian.com/world/2015/mar/24/no-africans-restaurant-owner-arrested-nairobi-kenya> (discussing the arrest of the owner of a Chinese restaurant in Nairobi that had a “no Africans policy” following a social media furor and the emergence of the Twitter hashtag #noblackallowed); Chi-Yu Shih, *Harmonious Racism: China’s Civilizational Soft Power in Africa*, *THE FOCUS: AFRICA AND THE CHINESE WAY* (The Newsletter), Summer 2012, at 28 (noting that “lofty policy concessions and aid, as well as normative support for autonomy, are not sufficient to soothe Chinese racism toward Black people. In fact, almost 70% of respondents rank Africans lowest in social status in a survey.”). See also James Ferguson, *Expectations of Modernity*, in *PERSPECTIVES ON AFRICA: A READER IN CULTURE, HISTORY AND REPRESENTATION* 595, 601 (Roy Richard Grinker & Stephen C. Lubkemann eds., 2010) (discussing the color bar in colonial Africa).

328. Jennifer Whitman, *Fighting the Natural Resource Curse in Sub-Saharan Africa with Supply-Side Anti-Bribery Laws: The Role of China*, 11 *MANCHESTER J. INT’L ECON. L.* 121, 122 (2014).

329. *Id.* at 125.

330. Michael Malakata, *Telecom Deals with Chinese Companies in Africa under Spotlight Once Again*, *PCWORLD* (Sept. 14, 2015), <http://www.pcworld.com/article/2983210/telecom-deals-with-chinese-companies-in-africa-under-spotlight-once-again.html>.

331. Eric Olander, *China’s Mystery Deal with the African Union*, *THE CHINA AFR. PROJECT* (Feb. 4, 2015), <http://www.chinaafricaproject.com/podcast-china-african-union-aumou-transportation/>.

structure and institutional development might take place.³³²

Conclusion

Africa is potentially poised for significant future economic growth. Given likely future population increases, ensuring that new infrastructure projects are truly transformative will be a key element in actual realization of rosy economic predictions. In the case of infrastructure projects, such transformation will require attention to the wider environment surrounding infrastructure projects; transformation will also require taking steps to assure that such projects can be a basis for knowledge transfer, development of capacity, and a starting point for future projects that can be at least in part conceived, constructed, and maintained locally. By taking such steps, new infrastructure projects reflecting a vision of sustainability and recreation can be a basis for African transformation rather than a repetition of past failures.

332. Similar concerns about transparency have been raised in relation to a 2015 cyber-security agreement between South Africa and China. Charlie Fripp, *DA Concerned Over Cyber Security Deal with China*, HTXT.AFRICA (June 10, 2015), <http://www.htxt.co.za/2015/06/10/da-concerned-over-cyber-security-deal-with-china/>.

