

CHINA'S INFRASTRUCTURE DEVELOPMENT IN AFRICA

AN EXAMINATION OF PROJECTS IN TANZANIA AND KENYA



EDITED BY
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China's Infrastructure Development in Africa An Examination of Projects in Tanzania & Kenya

**Edited by
Veda Vaidyanathan**

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FOREWORD



The study titled '*China's Infrastructure Development in Africa: An Examination of Projects in Tanzania and Kenya*' was undertaken as part of the 'China in the World' research programme at the Institute of

Chinese Studies (ICS). Although the original and continuing priorities of ICS research and public outreach include China's polity, economy, history, culture, society and foreign policy, with particular reference to India–China relations, this focus has now been broadened to cover new geographical regions. This includes China and India in Africa, China and India in Latin America and South Asia and at a more general level, the respective roles of India and China in the world of the future.

The aspiration to contribute to the larger conversation surrounding Chinese engagement in the African continent from a uniquely Indian perspective led to this study project. This is significant, considering that the amount of fieldwork-based research on this area emanating from non-western academic and research institutes is not substantial. It also aims to create linkages with international experts and institutes conducting research in this field and establish partnerships that will facilitate information sharing and knowledge generation.

This monograph is the result of the first project focusing on Africa under the vertical and this research study sought to examine China's changing role in the infrastructure space in Africa, particularly Tanzania and Kenya. The ICS collaborated with research institutes in both Tanzania and Kenya and partnered with

research scholars from different countries. The multicultural team, curated by ICS, conducted month long fieldwork in Mumbai, Nairobi, Mombasa, Dar es Salaam, Dodoma and utilising, interviewing multiple stakeholders. By utilising a case study method, the attempt was to gain an in-depth understanding of six projects in East Africa.

The contribution of this monograph is to provide a stakeholder perspective to the ongoing global discourse on China's growing presence in Africa. The case studies identified range from Chinese-built fibre optic cables, ports, and airports to gas pipelines and involve several Chinese actors and a multitude of Tanzanian, Kenyan and other stakeholders. Closely studying these projects not only brings to the fore the drivers, strategies and outlook of Chinese companies but also highlights the opportunities presented to and challenges faced by African governments in these interactions. Furthermore, it also identifies the unique strengths that are enabling Chinese companies to dominate the infrastructure sector in these countries and also contextualises issues such as the infrastructure fueled rising debt and changing perceptions of China in Africa.

The findings from this study were disseminated in a workshop hosted in New Delhi in April 2019 after which the monograph underwent a comprehensive peer-review process prior to publication.

The ICS will continue to facilitate such transnational research projects examining Chinese engagement in various African countries. Considering that India is presenting itself as a viable partner to the African development effort, the ICS aims to inform policy makers, scholars and members of the industry of the fast-evolving dynamics of the region.

Ashok K. Kantha

Director, Institute of Chinese Studies

PREFACE



The ICS Monograph – *China's Infrastructure Development in Africa: An Examination of Projects in Tanzania and Kenya* – is a seminal study combining serious desk research with empirical fieldwork. Conceived and executed

by a trans-continental team composed of a trio of African, Chinese and Indian scholars, the monograph breaks new ground. It is academic, objective, yet practical and relatable.

The monograph deals with specific facets of 'Chinafrica' – the phenomenon of China's expanding footprint in the economic domain, especially infrastructure development, in African states in recent decades. It is a subject of great importance and widespread interest. No discussion on Africa's politics, economy, social cohesion and external relations is complete today, without a reference to China's role in it.

The subject often receives more of an emotional treatment rather than a rational and reasoned examination it deserves. The question of 'debt trap' figures in the discourse frequently. Western scholars tend to be critical of the Chinese approach, noticing elements of neo-colonialism in it, while the Chinese justify and assesses the policy in favourable terms. African officials and observers, on the other hand, insist that Africa knows what it is doing. Some of them suggest that criticisms come from the West and other countries because their companies are not engaged even in a fraction of projects handled by Chinese companies. What is the reality? The authors argue that the "debt trap narrative ... does not hold much water." This study will be an essential tool to obtain clarity on this aspect.

Africa is a continent of 55 countries. Today, Chinese infrastructure development projects are spread across the region – north, west, central,

east and southern Africa. Given the vastness of the geographical area and the scope of operations, the authors rightly selected a specific part of East Africa and a handful of infrastructure projects relating to ports, connectivity and transport, and power and communication for detailed case studies. They managed to interview a total of 40 African, Chinese and Indian stakeholders for their perspectives. Their success in interacting with officials as well as those executing projects in the field has added novelty and freshness to the authors' perceptions.

The chapter entitled 'Conclusion' will be of considerable interest and is likely to be discussed widely. The study points out that Africa-China cooperation has an important role to play in the continent's continued development where infrastructure would have spillover effects, both direct and indirect, on revenue, incomes and livelihood. Lessons drawn in regard to FOCAC VI and Africa's chances of achieving Sustainable Development Goals are also presented. At the same time, the possibility of "friction" between Africa's Agenda 2063 and Beijing's new deal for the continent's development are candidly suggested. The study also carries some recommendations/take-aways for Indian actors.

I sincerely congratulate the authors – Dr. Veda Vaidyanathan, Ms. Tong Wu and Dr. Jumanne Gomera – for their brilliant work. I also compliment the Institute of Chinese Studies for this innovative project. It is to be hoped that it will inspire similar studies concerning projects by other countries, particularly India. This may open new pathways to a deeper understanding of development projects in Africa on a broader canvas.

Ambassador Rajiv Bhatia

Distinguished Fellow, Gateway House, Former High Commissioner to South Africa, Kenya and Lesotho, Former Director General, Indian Council of World Affairs (ICWA)

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This project, aimed at conducting evidence based, in-depth, country and project level analysis, was made possible with funding from the Tata Trusts and their support is gratefully acknowledged. Our gratitude extends to interviewees in Mumbai, New Delhi, Nairobi, Mombasa, Dar es Salaam, Dodoma and Zanzibar for insights provided during the course of this study, anonymously and otherwise. We are also thankful to all the participants of the roundtable discussion co-hosted by ICS & Nehru Memorial Museum and Library (NMML) in April 2019, for their inputs and comments after the research team disseminated the preliminary findings. We are thankful to Shri. Shakti Sinha, Director, NMML and Dr. Sanjay

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This study would not be possible without the support, insights and guidance provided by Amb. Ashok K. Kantha, Director, ICS. His encouragement and enthusiasm ensured the seamless progression of the project to its completion. We would also like to recognise Amb. Rajiv Bhatia, Former High Commissioner to South Africa, Kenya and Lesotho and Dr. Durgesh K. Rai, Senior Fellow, Indian Council of Research on International Economic Relations (ICRIER), for reviewing the full draft of the monograph prior to its publication and for their detailed comments. We are also thankful to Amb. Bhatia for writing the preface to this publication.

Thanks to colleagues at ICS especially Dr. Madhurima Nundy, Assistant Director, ICS for her help in navigating multiple administrative bottlenecks. The efforts of Mr. Prithvi Raj Singh, Administrative & Programme Officer, ICS and Ms. Poonam Singha, Accounts Officer, ICS for helping organize fieldwork logistics are also gratefully acknowledged. I am also thankful to the other Research faculty and Administrative staff at the ICS for their warmth and support throughout the course of the study.

Veda Vaidyanathan, PhD

Research Associate, ICS & Project Lead

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LIST OF ABBREVIATIONS

AAGC	Asia-Africa Growth Corridor
AAKIA	Abeid Amani Karume International Airport
AfDB	African Development Bank
AGDI	African Governance and Development Institute
AICD	Africa Infrastructure Country Diagnostic
AIIB	Asian Infrastructure Investment Bank
ATU	African Telecommunication Union
AU	African Union
AUC	African Union Commission
BCEG	Beijing Construction Engineering Group
BOOT	Build-Own-Operate-Transfer
BRI	Belt and Road Initiative
CAGR	Compound Average Growth Rate
CARI	China Africa Research Initiative
CCCC	China Communications Construction Company
CDB	China Development Bank
CHEC	China Harbour Engineering Company
CIDCA	Chinese International Development Cooperation Agency
CITCC	China International Telecommunications Construction Corporation
CMHI	China Merchants Holding International
CPPEC	China Petroleum Pipeline Engineering Corporation
CPTDC	China Petroleum Technology & Development Corporation
CRBC	China Road and Bridges Corporation
CRCEG	China Railway Construction Engineering Group
D&B	Design & Build
DFID	Department for International Development
DMGP	Dar es Salaam Maritime Gateway Project
DRC	Democratic Republic of Congo
DWDM	Dense Wavelength Division Multiplexing
ECA	Economic Commission for Africa
EHSMP	Environmental, Health and Safety Management Plan
EPC	Engineering, Procurement and Construction
EPZ	Export Processing Zone
ESIA	Environmental and Social Impact Assessment
ESLSE	Ethiopian Logistics & Shipping Enterprise
ESMP	Environmental and Social Management Plans
Exim	Export & Import
FDI	Foreign Direct Investment
FOCAC	Forum on China-Africa Co-operation
GoT	Government of Tanzania
HPC	Hamburg Port Consulting

IBRD	International Bank for Reconstruction and Development
ICA	Infrastructure Consortium Africa
ICRIER	Indian Council of Research on International Economic Relations
ICS	Institute of Chinese Studies
ICSSR	Indian Council of Social Science Research
ICT	Information and Communications Technology
IDA	International Development Association
IDC	Internet Data Centre
IEA	International Energy Agency
ISP	Internet Service Providers
ISSCAD	Institute of South South Cooperation and Development
KNBS	Kenya National Bureau of Statistics
LIDC	Low Income Developing Countries
LNG	Liquefied natural gas
LGA	Local Government Authority
MOFCOM	Ministry of Commerce
MDA	Ministries, Departments and Agencies
NDB	New Development Bank
NDRC	National Development and Reform Commission
NEPAD	New Partnership for Africa's Development
NICTBB	National Information and Communications Technology Backbone
NMML	Nehru Memorial Museum and Library
ODF	Official Development Finance
OFC	Optic fibre cable
PAP	Priority Action Plan
PATT	Peking University - Africa Student's Think Tank
PIDA	Programme for Infrastructure Development in Africa
PKI	Public Key Infrastructure
PRC	People's Republic of China
RBM	Results Based Management
RCIP	Regional Communications Infrastructure Project
RIA	Regional Integration Agreements
SACE	Sino Africa Centre for Excellence
SAIS	School of Advanced International Studies
SDH	Synchronous Digital Hierarchy
SGR	Standard Gauge Railway
SGRF	State Government Reserve Fund
SME	Small and Medium Enterprises
TEU	Twenty Foot Equivalent Unit
TMEA	TradeMark East Africa
TPA	Tanzania Port Authority
TRCA	Telecommunications Regulatory Agency
TRL	Tanzania Railway Line
TTCL	Tanzania Telecommunications Company Limited
ZAA	Zanzibar Airports Authority

EXECUTIVE SUMMARY

China is building a narrative around its norm-changing reengagement with countries in Africa, one infrastructure project at a time. The continent, housing some of the fastest growing economies in the world and an incredibly young demography, is experimenting with a trajectory of development with uniquely Chinese characteristics - that of infrastructure driven growth. Through a strong comparative advantage in construction services, the tenets of 'South-South' cooperation and a narrative of 'win-win' collaboration, China has managed to present itself as an effective substitute to traditional western players and market itself as a 'partner' in development.

A number of opinions prevail on the subject of China's infrastructure engagement with Africa. Some maintain that China's role in affecting an infrastructure push in Africa will spur economic activity by reducing a host of transaction costs and generating employment. Others are less sanguine, suggesting that Africa is merely a strategic outlet for the export of China's overcapacity, resulting in lesser due diligence towards ensuring the profitability of projects, a distorted infrastructure market and reckless construction of white elephants. Others view the engagement as a bid to expand Chinese political influence in the continent under the auspices of the Belt and Road Initiative (BRI).

Studying the successes and shortcomings of China's engagement in Africa allows for an insight into its larger foreign policy ambitions, while a granular analysis of its interactions in the continent provides a template to recognise patterns in its interface with other geographies. Exploring this theme is critical from an Indian perspective, given that national, sub national and private Indian actors are active across the region. India-Africa bilateral trade in 2017-18 stood at USD 62.66 billion while 189 projects in 42 African countries amounting to USD 11.4 billion are being

implemented under LoCs (Ministry of External Affairs 2019). As the government of India looks to strengthen its political and economic ties with countries in Africa and its diaspora, several Indian Multinational Corporations (MNCs) and Small and Medium Enterprises (SMEs) are entering African markets encouraged by the relative success of India Inc. in the continent.

This monograph strives to look beyond the big headlines, critically and objectively examine the realities of China's infrastructure engagement with Africa on the ground and contextualise it against secondary literature. The first chapter provides an overview of the dynamics of contemporary China-Africa relations and brings in different perspectives on the subject. It touches on aspects like historical interactions, trade and investments, new infrastructure financing, the BRI, Chinese diaspora in Africa, summit diplomacy and debt concerns. The magnitude of China's infrastructure engagement is staggering. A study of Africa's economic partnerships across areas such as trade, infrastructure financing, aid, investment stock and growth shows that China is among the top four partners across all dimensions. Between 2000 and 2017 the Chinese government, banks and contractors extended around USD 143 billion in loans to African governments and state-owned enterprises.

Chapter two of the study examines the role of China's infrastructure initiatives in overall growth and development of African economies. It highlights the general trends in the infrastructure initiatives undertaken by China and their impact on economic activities of African nations. Growing infrastructure demand along with limited supply provides fertile ground for entrants such as Chinese construction companies that are highly competitive and face weak demand back at home. As per data of the China Africa Research Initiative (CARI), revenues of Chinese

construction companies in Africa during the period 2003-2016 period amounted to an overwhelming USD 408.8 billion. From regional and country wise distributions of China's infrastructure activity in Africa, it is gleaned that China's motivations behind encouraging construction in Africa lie not only in demand for natural resources, but also to secure business for highly leveraged state owned construction enterprises. The growth has been robust, especially after the early 2000s. The study finds a negative relationship between China's infrastructure activities and levels of industrialisation and regional economic integration in African economies. While no conclusions are made on whether infrastructure activity causes attenuation in these variables, the chapter offers some tentative explanations for the observations.

The focus of the third chapter is China's involvement in port infrastructure. It examines two major port projects in Tanzania namely the Dar es Salaam Maritime Gateway Project (DMGP) and the Bagamoyo port project. The case of the DMGP offered interesting insights into the assumptions underpinning the operations of the contractor, China Merchants Holding International (CMHI). Being a project funded by the World Bank stringent environmental standards and social safeguards were laid down, raising costs substantially for the contractor involved. In a bid to boost the company's reputation and establish the 'China brand,' the contractor was willing to forego its usual profit margin to secure the project. It was observed that tacit support of the state was instrumental in enabling the contractor to operate in this fashion. Examining the Bagamoyo port project sheds light on the challenges that emerged in the process of negotiating construction deals which include transparency and communication problems, and disagreements over regulatory procedures and loan repayment terms. Boggled down by these encumbrances, the project stands suspended at the time of writing.

Chapter four deals with connectivity and transport infrastructure and examines Chinese involvement in two projects - the Mombasa-Nairobi Standard Gauge Railways (SGR) in Kenya and Zanzibar Airport in Tanzania. The SGR is largely financed by Chinese loans and is being constructed by the state-owned China Road and Bridges Corporation (CRBC). It is also a part of the BRI. Investigating the SGR revealed a mixed picture. Construction has, indeed, boosted employment to the tune of 46,000 jobs, contributed to skilling of workers by way of training in China and lowered transportation costs substantially. On the other hand, the project has palpably suffered from flawed planning. Disruption to existing modes and arrangements of transport were not adequately accounted for. Doubts exist as to whether the Chinese contractor adhered to local procurement requirements. Most importantly, however, uncertainty has arisen over whether the Kenyan government will be able to service the debt incurred from China Export & Import (Exim) Bank - debt concerns have already led to a gridlock on the Uganda segment. At a cost far higher than the Addis Ababa-Djibouti line, whether Kenya gains from the SGR in an overall sense is debatable. The case of the Zanzibar Airport which is being funded by China Exim and constructed by Beijing Construction Engineering Group (BCEG) is less ambiguous. Due to faults in the designing process, construction has been delayed inordinately and funding constraints have become increasingly onerous. Meanwhile, it was once again observed that raw materials were procured in large part from China. Despite the suspension of funding, however, the Chinese contractor continued construction, once again suggesting that tacit support from the Chinese state has been forthcoming. Another important point that the case highlighted was the use of Chinese construction standards over local or international standards.

The fifth chapter examined power and communications infrastructure. It examines two projects in Tanzania - The National Information and Communications Technology Backbone

(NICTBB) and the Mtwara – Dar es Salaam Natural Gas Pipeline Project. The NICTBB is largely funded through a concessional loan provided by China EXIM bank and Chinese companies are the key players involved in construction. Huawei is the main supplier of the telecom equipment and services required for the project. The NICTBB will expand connectivity not only within Tanzania but also between neighboring countries like Kenya, Uganda, Rwanda, Malawi, and Burundi. Given low levels of internet penetration in Tanzania, the NICTBB is certainly expected to provide a fillip to economic activity in the region. While it was discovered that the skills training provided to the local operators by the Chinese companies was largely superficial, government stakeholders nonetheless expected the project to generate large payoffs. The risk of under utilisation of telecom infrastructure due to local management inefficiencies looms large, however, casting aspersions on whether Tanzania currently possesses the capacities necessary to exploit the NICTBB to its potential. The project also plays the important role of boosting Huawei's competitiveness in the East African telecommunications market by establishing Chinese technical standards and ensuring a steady stream of maintenance contracts. The

Mtwara – Dar es Salaam Natural Gas Pipeline Project will carry natural gas from Mtwara to Dar es Salaam and is mainly funded by China EXIM bank albeit with non-concessional loans and is being constructed by China Petroleum Technology & Development Corporation (CPTDC) and the China Petroleum Pipeline Engineering Corporation (CPPEC). While the pipeline will prove instrumental in enabling Tanzania to exploit newly found reserves, the project experiences a host of problems that have complicated the construction. More than three quarters of goods used for the project have been imported from China and the role of local industry has been limited to the supply of some basic, low value added goods and services. Moreover, construction came up against resistance from the local authorities and citizens of Mtwara who accused the central government of indiscriminate appropriation of the regions bounties. The concluding chapter lists out the reasons why Chinese companies are dominating African infrastructure markets. It outlines the potential as well as the pushback Chinese engagement in the region has received. The section marries insights from the ground with larger policy perspectives and identifies areas of promise for Indian actors.

INTRODUCTION

Veda Vaidyanathan

China is building a narrative around its norm-changing re-engagement with countries in Africa, one infrastructure project at a time. The continent, housing some of the fastest growing economies in the world and an incredibly young demography, is experimenting with a trajectory of growth with uniquely Chinese characteristics. Interactions with African nations have provided Beijing the opportunity to craft its image as a global actor with non-western principles. Through the tenets of 'South-South' cooperation and the narrative of a 'win-win' collaboration, China has managed to present itself as an effective substitute to traditional Western players and market itself as a partner in development. Although realities on the ground suggest that these relationships are far from being truly symbiotic, for African nations looking for partners to help harness the resources- both material and human- that it possesses, China has emerged as a formidable ally.

Through the tenets of 'South-South' cooperation and the narrative of a 'win-win' collaboration, China has managed to present itself as an effective substitute to traditional Western players and market itself as a partner in development.

As this hyper active engagement in the China - Africa milieu has captured imaginations globally, the resources spent by China in building infrastructure in Africa is perhaps the most critical to examine closely. Especially because infrastructure development is an area of cooperation that is not nascent, as the construction of the TAZARA railway by the Chinese in the 1970's, after Western donors

refused to fund the project, is often considered a watershed moment in contemporary Sino-Africa relations. The railway line linking Zambia's copper belt to the port in Dar es Salaam, ended Zambia's dependence on Rhodesia which was still occupied by colonial forces. Beijing lent out USD 500 million interest free loan (French 2010), exporting both technology and workers for its construction and is often referred to as Africa's 'Freedom Railway' (Monson 2009). At the time, it was China's single largest foreign-aid project and is now viewed as a testimony of China's long-standing commitment to the continent, with a section of the Lusaka National Museum in Zambia dedicated to memorabilia from construction of the TAZARA. Since then China's infrastructure fueled diplomacy has come a long way, from building the African Union headquarters in addition to ports, roads, railways, bridges, hydropower plants, government buildings, stadiums, hospitals and schools in several African countries.

Estimates from AidData (AidData 2017) points out that China has built over 3000 largely critical, infrastructure projects while data from Chinese sources claim that they have built more than 5000 km of roads and railways in Africa and trained 160,000 local people via its projects (Xinhua 2018). However, a different point of view suggests (Wuttke 2017) that with the phenomenal rise in Chinese construction firms domestically, Africa has been a strategic outlet for exporting their overcapacity and consequently expanding their influence in the continent. Worryingly, recipients of these projects are sometimes unable to pay back Chinese loans.

In Zambia for instance, national debt estimated at 35.6 per cent in 2014, rose to 60 per cent of its GDP by the end of 2018, with the debt burden accounting for more than 28 per cent of its national expenditure (Chutel 2018). Recently several reports suggested that Chinese companies would seize Zambian national assets including state electricity company Zesco and the Kenneth Kaunda airport due to the government defaulting on loans, which were later dispelled by both Beijing and Lusaka (Garrie 2018). A report by Africa Confidential (Funga 2018) stated that Zambian government is supposed to contribute 15 per cent of the funding for Chinese backed projects, a financial commitment that was taking precedence over social expenditures, prompting the finance minister Mwanakatwe to pledge that all Chinese projects that were less than 80 per cent complete will be halted – only to be negated by President Lungu – who promised publicly that there would be no disruption in ongoing Chinese projects. Similarly, a USD 300 million airport project was terminated in Sierra Leone (BBC 2018). Criticism – fueled by opaque negotiation procedures and agreement details – of the value of several projects has also been more prominent.

On the issue of debt, African stakeholders are divided. While some lament about the debt burden these infrastructure projects place on economies, others highlight the transformational effect it has had on local populations (Soule 2019; Mlambo 2018; Nyabiage 2019). In Afrobarometer's survey of 36 countries, for instance Africans rank China as the second most preferred development model for their own countries after the US (Lekorwe, Chingwete, Okuru and Samson 2016). According to this survey, one of the main factors that helped alter perceptions

in Beijing's favor was its engagement in developing African infrastructure. Considering that Africa's humongous infrastructure gap is estimated to require massive investments to the tune of USD 130-170 billion (Ballard 2018), China's focus on the sector has been welcomed by most African governments. However, there has also been criticism and accusations that Chinese supervisors are racist and discriminating against African employees (Goldstein 2018).

The narrative around the physical infrastructure built by Chinese companies in Africa sways from being an exercise in altruism, a diplomatic instrument used to foster political allies, an economic opportunity for Chinese construction firms in African cities, to being viewed as a tool of exerting power and extending China's realm of influence, especially under the Belt and Road Initiative (BRI). Furthermore, from setting up multilateral frameworks to increasing diplomatic outreach, experts argue that the 'China' factor, has influenced the approach of other actors active in the continent as well. With experts weighing in on the instruments and impact of these structures, this project sought to conduct evidence based research to inform opinion and policy.

The rationale for this study arose from the understanding that examining China's engagement in Africa will allow for an insight into its larger foreign policy ambitions, but a granular analysis of its interactions in the continent will provide a template to recognise patterns in its interface with other geographies. This theme is critical to examine from an Indian perspective given that national, subnational and private Indian actors are active across the region. India-Africa bilateral trade in 2017-18 stood at USD 62.66 billion while 189 projects

in 42 African countries amounting to USD 11.4 billion are being implemented under LoCs (Ministry of External Affairs 2019). As the government of India looks to strengthen its political and economic ties with countries in Africa and its diaspora, several Indian Multinational Corporations (MNC) and Small and Medium Enterprises (SME) are entering African markets encouraged by the relative success of India Inc. in the continent.

This phenomenon of increasing Chinese influence in Africa, largely driven by these infrastructure projects that host countries cannot build and sometimes even afford, needs to be studied by any player engaged in Africa. Studying Beijing's drivers, motivations, tools, approaches, methods and actors would help India draw conclusions to fine tune its evolving African strategy. It will also provide a perspective into how New Delhi can create developmental agendas that could give countries in Africa alternatives and lower dependency on any one player. Given that India is attempting to re-engage countries in Africa through initiatives such as Namaskar Africa (Omusolo 2019), it becomes especially critical to demystify Chinese engagement in the region as it is not only changing the way business is conducted, but is also redefining existing dynamics.

This phenomenon of increasing Chinese influence in Africa, largely driven by these infrastructure projects that host countries cannot build and sometimes even afford, needs to be studied by any player engaged in Africa.

Experts have been vocal about how countries like India can play a vital role in creating jobs and help African development (Brookings 2015). Another interesting phenomenon has been

countries coming together to address specific challenges in Africa. For instance, India and Japan are exploring ways of leveraging their strengths and finding scope for collaborations even outside frameworks such as the Asia-Africa Growth Corridor (AAGC). Therefore, it would not be farfetched to imagine that there are areas where India can find shared interests with other actors and work together to provide alternatives to their African counterparts.

As the continent of Africa is heterogeneous and diverse, this study focused on the Infrastructure sector that has helped build, sustain and further Sino-African relations in Tanzania and Kenya. Chinese construction companies are active in these two countries for the past few decades, with projects like the National ICT Backbone across cities, towns and villages, constructing the Zanzibar Airport, expanding the Dar es Salaam port and laying the Mtwara – Dar es Salaam Natural Gas Pipeline Project in Tanzania. Chinese companies have become critical to Tanzania's infrastructure development drive. Kenya, on the other hand, has housed some of the most high-profile Chinese projects in recent times such as the USD 4 billion Mombasa-Nairobi Standard Gauge Railway named 'Madaraka Express'. Chinese officials have termed this railway the 'early harvest outcome of the Belt and Road Initiative' while Kenyan leaders attribute it to 'accelerating African industrialisation'.

As information on Chinese construction projects in the continent range from being alarmist to apologist and sensitive, the researchers interviewed a total of 40 African, Chinese and Indian stakeholders for differing perspectives. While the existing literature helped build context, the data collected from the field was analysed objectively. The fieldwork in Africa involved interviewing stakeholders - both government officials and private

entrepreneurs – engaged in the process of proposing, approving, building, regulating and maintaining physical infrastructure in addition to contractors, operators, manufacturers, engineers and auxiliary industry business owners. Verbal agreements were received from all interviewees and names of those that wanted to remain anonymous have not been used. The research was drawn from history and carried through to the present and the cases are studied individually and analysed collectively. Examining these critical construction projects against the ambitious Belt and Road Initiative also brings in a new dimension to interactions. This monograph strives to look beyond the headlines to critically and objectively examine the realities on the ground and contextualise it against secondary literature.

One of the main contributions this study seeks to make is to add value and inform the existing conversation on Chinese infrastructure led engagement in Africa that will be beneficial to both policymakers and industry alike. After the first draft of the report was ready, the ICS in partnership with NMML hosted a roundtable discussion in New Delhi with Indian academics, diplomats, members of the industry and other institutions where the research team presented the preliminary findings of this study. The comments received were incorporated before the monograph was sent to experts for peer review. Their comments are also included into the final draft of the monograph.

Given the scale of the African continent and the range of Chinese actors engaged in various countries and sectors, the conclusions arrived at in this study are based on the literature reviewed and specific case studies examined. Moreover, as this project was carried out with a small team and a modest budget, the scope of the study is restricted. The regression analyses

carried out in the second chapter are meant to provide a preliminary, empirical understanding of the manner in which China's infrastructure activities on the continent correlate with certain development fundamentals. As such, causality between China's initiatives and African development is not clearly established and the chapter only goes so far as to proffer possible explanations behind the observations made. Lack of comparable data for other foreign players in Africa's infrastructure markets means that no comment can be made as to whether Chinese initiatives are different from the norm. The analysis conducted here will provide a foundation for more robust analyses as data becomes available.

This monograph begins with a chapter that provides an overview of China-Africa relations for the uninitiated. It engages with a wide array of literature, brings in multiple perspectives and covers several themes including historical interactions, trade and investments, Chinese multilateralism and FOCAC, new infrastructure financing: Africa and the AIIB, Chinese diaspora in Africa, loans, debt and responses to default and the Belt & Road Initiative in Africa. The second chapter explains the correlation between infrastructure and growth, Africa's salience in China's global construction contracts, regional distribution of construction within Africa and China's infrastructure development in Africa - statistical relation with economic parameters. The third chapter (Building & Developing Port Infrastructure), fourth chapter (Connectivity and Transport Infrastructure) and fifth chapter (Power and Communication Infrastructure) provide a close examination of the six case studies identified in the project. These are followed by the concluding chapter consisting of reflections and recommendations.

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OVERVIEW OF CHINA-AFRICA RELATIONS

Veda Vaidyanathan and Sunaina Bose

China's increasing presence in Africa has often been described as Beijing making 'new inroads' in the continent. This understanding of the dynamic contemporary relationship glosses over the fact that China's interactions with Africa go back many centuries. It is widely believed that during the Ming Dynasty, Zheng He led a fleet of ships to the Sultan of Malindi, present day Kenya (Musgrave and Nexon 2017).

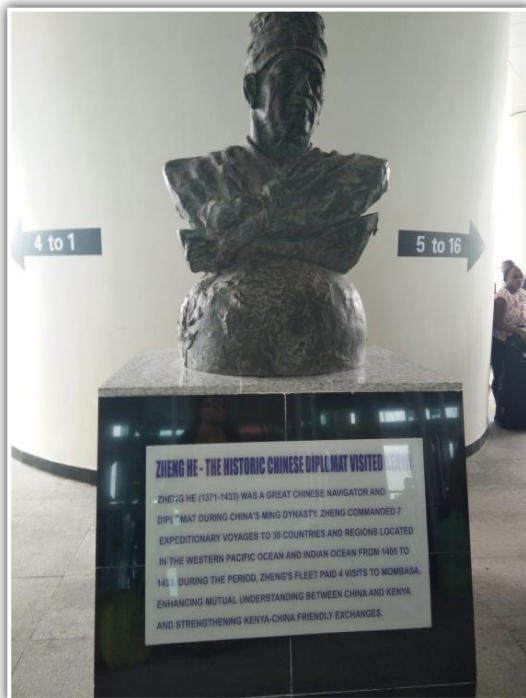


Photo: Statue of Zheng He in the Chinese built SGR Terminus in Kenya, explaining the role of the navigator in building and furthering China-Kenya relations.

In the 20th century, the foundation of the People's Republic of China (PRC) coincided with the African independence struggles and China recognised this as an opportunity to forge relationships with countries in the continent. The Bandung Conference (1955)

and the formulation of the Five Principles of Peaceful Coexistence formed a cornerstone in developing diplomatic relations with the newly decolonised countries in both Asia and Africa. In 1956, Egypt became the first African nation to establish diplomatic ties with the People's Republic of China (MOFCOM 2004).

G.T. Yu argues that China's early interactions with African nations were broadly based on three principles: export of the 'Chinese model', its policy towards the Cold War superpowers and its 'third world policy' (Yu 1970). China's interactions with Africa during this period took a more radical line where engagement with African nations were seen as an opportunity to ideologically challenge both the US and the Soviet Union, leading to what is known as China's 'export of revolution', where it diplomatically and militarily supported several pro-liberation movements in the continent (Cheng 2009). These periods of intense interactions saw the establishment of China-Africa People's Friendship Association in 1960 and Zhou Enlai's seven-week tour to the continent from the end of 1963 to the beginning of 1964; the first trip by a Chinese head of state to Africa since its establishment in 1949 (China Daily 2014). This is also the time when the Chinese extended financial support to the continent in the form of 'no-strings attached' loans that included technical assistance and using African exports as a long-term payment method. China also made investments in African media, which is speculated to be an attempt to counter the image of Communist China in the Western media (Alden and Alves 2008).

The 1960s and 1970s were high points of Chinese interaction with African nations with almost thirty-six nations establishing diplomatic relationships with mainland China over the two decades (Zezeza 2014). China's interactions with other nations was based on the 'One China' Principle which implies the automatic derecognition of Taiwan as a sovereign country (Bush 2017). In 1971, the United Nations switched its recognition from Taiwan to the People's Republic of China (Winkler 2012), a process which was crucial to constraint China's 'radical' strand in foreign policy. Twenty-six African nations supported China's stance in the UN and currently, all African countries except for the Kingdom of Eswatini recognises the one China Principle.

During the era of Deng Xiaoping, China's Africa Policy underwent a change where it shed its ideological agenda, moving its focus to mutual benefit, shared interests and common development. After the Tiananmen Square incident, when Beijing was largely isolated from the western world, it prioritised old relationships including those with African nations. Following this, China has focused on South-South cooperation, established the FOCAC and formally entered the WTO. This ushered in a new high in the China-Africa relationship and today it is multidimensional and extends beyond what some have termed China's expansionist tendencies and neo-colonial ambitions (Alden and Alves 2008).

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CHINA'S ECONOMIC PARTNERSHIPS WITH AFRICA: A SNAPSHOT

Since the establishment of the FOCAC in 2000, Chinese State-Owned Enterprises,

private companies and small and medium scale enterprises have been engaging across geographies and sectors in the African continent. Not only has China emerged as the top trading partner (Luo 2018) for most African countries, Chinese actors have also been contracting engineering projects, investing in mining, agriculture, manufacturing, telecommunications, media and setting up joint business ventures.

As per data from the Ministry of Commerce (MOFCOM) of the PRC, China's total trade with Africa stood at USD 204.19 billion in 2018, recording a year-on-year growth rate of 19.7 per cent, which was well above growth rates with other partners (MOFCOM 2019). Of this, China's exports to Africa were valued at USD 104.91 billion while imports from Africa amounted to USD 99.28 billion. Another report released by the MOFCOM in December 2018 suggested that between January and October, Chinese investments in Africa amounted to USD 2.46 billion, with most of the investments targeted at countries in East Africa. The value of newly signed contractual projects reached USD 34.5 billion with Nigeria, Egypt, Congo, Uganda and Zambia being the largest contractual markets for China (MOFCOM 2018).

A McKinsey study of Africa's economic partnerships across areas such as trade, infrastructure financing, aid, investment stock and growth shows that China is among the top four partners across all dimensions. According to the report, "No other country matches this depth and breadth of engagement" and it also suggests that there are over 10,000 Chinese firms operating in the continent; of which 90 per cent are privately owned and one third of which reported profit margins of more than 20 per cent (McKinsey 2017). It also states that

in the manufacturing sector, 12 per cent of Africa's industrial production, valued at USD 500 billion a year, is handled by Chinese firms while 50 per cent of Africa's internationally contracted construction market is dominated by Chinese infrastructure companies. In the 1000 firms that McKinsey researchers interviewed, 89 per cent of the employees were African providing 300,000 jobs, a figure when scaled up across 10,000 firms amounts to employment generated for a few million Africans (Sun, Jayaram and Khasiri 2017).

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From 2000 to 2010 the Chinese government had singled out certain sectors where investments would increase. These were to expand infrastructure, modernise agricultural production and contribute to overall agricultural development and improve health and education sector. The amount of loans made available to African states was increased along with the China-Africa Development Fund so that more Chinese investments could be supported in Africa. Government-owned Chinese banks such as EXIM and China Development Bank (CDB) play a significant role in tapping the business potential of Africa. These banks are dynamic supporters of the PRC government's 'Go Abroad' policy and hence provide cheap loans for investments, especially in the energy and mineral sectors. The FOCAC Action Plan (2016-2018) had pledged Chinese support to building African industry, agriculture, manufacturing, health, education and infrastructure. With frequent high-level diplomatic exchanges,

Africa has not only emerged as a foreign policy priority but an important destination for China's active economic diplomacy (Sun, Jayaram and Khasiri 2017).

SUMMIT DIPLOMACY: CHINESE MULTILATERALISM AND FOCAC

The turn of the century has often been hailed as a high point for multilateralism, with the end of the Cold War and the emergence of 'new centers of power'. This development coincides with China's shift from bilateralism to increased participation in multilateral initiatives. The Forum on China-Africa Cooperation (FOCAC) was founded in 2000 and draws from the historical relationship that the two have shared over the second half of the last century and continues to be one of China's many successful initiatives in South-South cooperation. FOCAC not only provides a platform for cooperation and diplomacy, but has become synonymous with Chinese aid, infrastructure assistance, investment, trade and interest in the continent (Li and Yazini 2013). The tri-annual event had its first edition in Beijing, the 2003 summit was held in Addis Ababa, 2006 in Beijing, 2009 in Egypt, 2012 in Beijing, 2015 in Johannesburg and then again in Beijing in 2018.

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Shen Wei makes a case for Chinese multilateralism, making it an indispensable portion of its 'peaceful rise' and integration into the global world order. As a consequence of the modernisation process in China which has furthered its involvement in the global economy

and politics, it is now an active participant in summit diplomacy where FOCAC continues to be one of the most successful examples of its 'win-win partnership and cooperation within the 'Global South'. The Chinese rhetoric has time and again touched upon issues of capacity building, bridging the infrastructure gap in the continent, and regional as well as trans-African integration. Chinese cooperation, especially aid, within and outside FOCAC is often hailed as apolitical, no-strings attached and free of the donor-donee binary by both the Chinese and several African countries, thereby providing an alternative to the existing traditional partners of the continent (Wei 2008).

Luo Jianbo and Zhang Xiaomin argue that (Jinbao and Xiaomin 2011) the African Union, unlike EU, is far from being a supranational body with a stake at the individual sovereignty of member countries, and each of them do have an independent and distinct foreign policy and national interest. However there are a plethora of examples of Africa functioning as a singular bloc driven by common interests, especially in multilateral institutions like the United Nations. It is necessary to separate policy plans for individual states, instead of clubbing the continent into one homogenous unit.

The latest edition of the summit in 2018, was attended by 53 of the 54 countries in Africa. The Government of The Kingdom of Eswatini which has diplomatic relations with Taiwan did not participate in the forum (Mardell 2018). This raised several questions of China's political agenda in the continent as well as the validity of its 'noninterference' and 'no-strings attached' policies. The forum took place amidst discussion on China's 'debt trap' concerns, 'neocolonialism' and issues of large-scale migration to the continent. One of the major

takeaways from the forum was that China's financial commitment to Africa remains at USD 60 billion, the same as the 2015 Johannesburg summit (Mardell 2018). This stagnation in Chinese financial support is touted to be in response to growing concerns of bad lending practices, rising domestic concerns over capital outflow and the ongoing trade war with the United States (Sun 2018).

Yun Sun also traces a shift from China's traditional 'resources for infrastructure model' to a more nuanced push for involving Chinese private sector in the continent, backed by its state-control industries that currently enjoy a foothold due to previous exchanges (Sun 2018). What has also come under a lot of discussion is the composition of the Chinese financial support to Africa. The premise of the 'debt book diplomacy' arguments underlie the fact that Chinese aid and loan are hard to differentiate, complicated by the fact that both are routed through MOFCOM. In her book *The Dragon's Gift* (2009), Deborah Brautigam argues that there exists an entanglement of aid and trade in Chinese activities in Africa, where one often cannot separate the two. The multipurpose characteristic of Chinese aid programs is reflected by the three key institutions involved: Ministry of Commerce, the Ministry of Foreign Affairs, and the China Eximbank. She also puts forth that the standardised definitions of the OECD is not applicable to Chinese aid and grant programs. In the China-Africa context the OECD considers contracting projects, technical cooperation, debt write-off, human resources training, the dispatch of medical teams and youth volunteers, emergency humanitarian aid and multilateral aid a part of the Chinese aid package. According to

Brautigam, the repayment of debts of large-scale infrastructure projects is also intrinsically tied to its performance and sustainability and the ability to generate an economy around themselves (Brautigam 2009).

This dynamic is predicted to undergo a shift due to the unveiling of a new agency specifically dealing with Aid. The announcement of the Chinese International Development Cooperation Agency (CIDCA), has generated quite some international as well as domestic conversation around the direction of Chinese aid and development policy (Mardell 2018). Its current Chairman Wang Xiaotao's background as the deputy director of NDRC has led to experts believing that the Belt and Road initiative will continue to remain at the forefront of Chinese foreign policy. The restructuring of the aid program also ensures that possibilities of trilateral partnerships open up, alongside its sustained focus on Africa as a site of aid. Experts have also commented on the changed composition of financial support to Africa, where 25 per cent of the USD 60 billion commitment is in the form of 'aid' - which comprises of concessional loans, grants and interest-free loans, possibly a response to growing insecurities of Chinese debt in the continent (Sun 2018).

President Xi Jinping, in his inaugural speech (Xinhua 2018), highlighted eight areas of cooperation: industrial promotion, infrastructure connectivity, trade facilitation, green development, capacity building, health, people-to-people exchanges and peace and security. The Chinese rhetoric favoured non-resource exports to China, a re-calibration on the 2017 trade data, where almost 95 per cent of the USD 70 billion exports from Africa to China were minerals, fuel and related commodities (MOFCOM 2018). China also

has strategically used FOCAC as a platform to dispel criticism against its Africa policy. Some of the recurring blame has been against its attitude to local African businesses, cross-sector capacity building, lending practices and environmental concerns. In the last edition of FOCAC too, President Xi addressed several of these issues, and promised debt relief among other things. Interestingly, in a bid to offset Chinese loans amounting to USD 40 million, in 2015, Zimbabwe adopted the Chinese Yuan as one of its currencies. The announcement was met with criticism and contention, with the Western media in particular depicting it as a move to expand the use of Yuan.

NEW INFRASTRUCTURE FINANCING: AFRICA AND THE AIIB

Chinese multilateral interactions with Africa is not restricted to the FOCAC. The establishment of the AIIB (Asian Infrastructure Investment Bank) in 2015, complemented the Belt and Road Initiative, and together they form one of the main pillars of Chinese outbound flows of goods, finances and diplomacy. With a section of experts terming the emergence of the AIIB as 'China's new multilateralism and the erosion of the West' (Renard 2015), it is increasingly being viewed as an outlet for China's excess capacity, a turning point in global geopolitics, with the country providing important international public goods and a rise in south-south cooperation. The China-led, multilateral bank currently enjoys a total of 100 members out of which 44 are regional members, 30 non-regional members and 26 prospective members. The AIIB is touted to have been formed to bridge the existing infrastructure gap primarily in Asia and Africa. It however might be of interest to note that its capital forms only about 60 per cent of that

of the Asian Development Bank (Hong 2015). Thomas Renard views AIIB as marking a shift from China's 'reformist' tendencies towards the liberal global order to a 'soft revisionist', making inlets to mutually beneficial programmes, that hold the same standards as existing multilateral lending institutions, thereby also mitigating, in the process, its reputation of bad lending practices, poor governance structures and reactionary tendencies (Renard 2015).

Experts also claim that the AIIB, a part of China's 'new model development finance' marks a shift in trajectory from traditional aid giving processes, that establishes a strong binary between the donor and the donee. It also shows a growing and overarching unease at the Washington consensus especially after the crisis of 2008, and a noticeable shift to the East for its experiences in development, resulting in increased interaction between Asian and African countries in general.

The start of a 'new global financing regime' led by alternate financial giants, whether it is the New Development Bank (NDB) or the AIIB, providing the global south, especially African countries a multitude of possible avenues for engagement with non-traditional aid giving institutions as well as states. Yet, despite it being viewed as an alternative to Western aid, the 'apolitical' component of these initiatives are under the radar, and been inflamed by the exclusion of Taiwan from AIIB. These arguments have undermined the difference from Western donors that China has tried to highlight in the narrative. In this regard, the Belt and Road Initiative too has often been compared to the Marshall Plan of the United States, drawing from their common underlying assumption of tying infrastructure building with development (Shen 2018). One interesting

point of discussion has been the question of how we understand African agency in relation to its approach to China, and how these states use, explore and identify it in a plethora of creative ways, especially in the post-BRI phase.

One interesting point of discussion has been the question of how we understand African agency in relation to its approach to China, and how these states use, explore and identify it in a plethora of creative ways, especially in the post-BRI phase.

The paper titled 'In the Driver's seat? African agency and Chinese power at FOCAC, the AU and the BRI', argues that over indebtedness to the Chinese, through large scale infrastructure projects, paradoxically opens up avenues for states to exercise this aforementioned agency. The author's believe the situation for loan recovery is as delicate for the Chinese side as it is for the Africans, as the Chinese will be careful to avoid measures like asset collateral (as in the Hambantota case in Sri Lanka) or 'conditionalities' associated with rescheduling of the debt, thereby providing a unique opportunity for the African countries to exercise their agency (Staadén, Alden and Wu 2018). It also might be interesting to note that this work refuses to solidify a definition for the term 'agency' and insists that it is a dynamic and ongoing process of contestation and compromise, not only emanating from key state actors, but also transnational NGOs, multilateral institutions, citizens etc.

Another interesting point of contention remains the extent to which the AIIB and the BRI complement each other and use multilateral platforms like the FOCAC to negotiate deals. The Western media has largely argued that

these phenomena cannot be seen in isolation or in a vacuum, and their cumulative effect cannot be brushed aside citing coincidence. David Dollar on the other hand argues that since the BRI implementation seems largely bilateral at the given moment, AIIB might not make too much of a difference in the existing schema (Dollar 2015). The annual lending capacity of the bank does not even come close to the requirements of the BRI and hence the macroeconomic difference caused by the bank is touted to be negligible.

What does seem to emerge from this ongoing narrative is a shift towards a discourse that ties infrastructure building to long term assurance of development. This is reflected not only in initiatives like the AIIB, BRI and the Silk Road Fund, but goes back in time, when China insisted on a focus on infrastructure within the World Bank itself, reflected in the much discussed Zedillo report (World Bank 2009). This presents a unique moment in history for the 'global south' in general and Africa in particular where the development discourse is being steered by the countries affected by it. This 'southern led' development, however, is not free of inbuilt inequalities. In the process the 'win-win partnership' has to be examined in depth, part of what this study aims to do. This new phase in transnational global development, spearheaded by China places infrastructure at the centre of the narrative. This is accompanied by an array of other initiatives like capacity building, student exchanges, installing 'soft' infrastructure etc. These issues bring about yet another extremely contested issue, that of migration.

CHINESE DIASPORA IN AFRICA

Howard French in his book 'China's Second Continent: How a million migrants are

building a new empire in Africa' argues that the question of Chinese worker-migrants is largely overlooked in mainstream academia. He believes that the ways in which these Chinese migrants negotiate with their African counterparts and the continent's customs, culture and law will broadly define the kind of influence China can exercise over Africa, something which cannot be controlled or predicted through planned political mediation and public diplomacy. French, however also concedes that migration, although heavily subsidised by Beijing to fulfill the growing labour requirements in Africa, occurs almost organically where the Chinese immigrants see Africa as 'a land of opportunities'. He does argue that the substantial wave of immigration should not be decoupled from Chinese geopolitical and commercial ambitions in the region (French 2014).

However, Giles Mohan and Ben Lampert have an interesting take on the dominant narrative of labour and migration and argue that African companies across several sectors themselves rely on China as a source of cheap, skilled, 'hardworking' and productive labour. Moreover, the surveys and studies conducted by them of Chinese enterprises conclude that a substantial proportion, and often the majority, of the workforce is African (Mohan and Lampert 2012). Irene Yuan Sun makes similar arguments regarding the popular narrative around Chinese migrant workers in Africa where she implies that elaborate research has produced conclusive results that concur to Chinese enterprises hiring a substantial percentage of local workers at various levels (Sun 2017).

The Western media has had an overwhelmingly negative response to the increased presence of Chinese migrants in the continent, linking

it to several peripheral issues like local unemployment, racism and China's 'neocolonial tendencies'. Ian Taylor argues that no evidence supports these blanket statements and that these reflect 'deep-rooted anxieties' of the traditional partners regarding China, a newer and successful player in Africa (Taylor 2014). It also might be of interest to note that the term 'migrant' and 'Chinese' itself are contested categories that can be used to homogenise several groups and erase important points of inflection.

The term 'Chinese migrants' is broadly used to describe temporary workers employed by state owned enterprises or private companies, as well as a relatively smaller group of independent migrants from coastal provinces in China who view Africa as a 'land of opportunities'. While most temporary workers return to China in a few years, a section of them stay back and start small-scale enterprises (Park 2009). This lack of classification tends to encourage the neocolonialist arguments put forth by a portion of African elites and the Western media. Scholars like Hannah Postel however argue that due to the presence of a multitude of private and transnational actors in the process, the intent of migration does not align with that of the Chinese state, as it is very often made out to be. Instead, like any other global flow, this case too has several nuances that need to be examined (Postel 2017).

Park also argues, unlike French, that migration of Chinese workers will depend on macro issues like broad China-Africa relations, interstate relations, the political as well as socio-economic conditions etc, and not the other way around where French argues that migrants and their socialisation will play a defining role in forming the larger political climate. Scholars

believe that Chinese migration to different parts of Africa is a particularly interesting case to examine, as it subverts the dominant theories of migration, that characterises it as a flow from underdeveloped areas to more prosperous areas (South-North migration) and represents the phenomena of South-South migration. Postel argues, especially for the Zambian case, that the South-South migration also means that unlike in traditional cases, where migrants occupy low paying jobs, leaving the upper rung to the 'educated natives', Chinese migrants do occupy managerial posts, and other 'primary' jobs and then often engage in skill transfer and capacity building projects (Postel 2017). It is then of interest to investigate the kind of jobs that native African citizens get in large-scale, employment generating projects funded and executed by the Chinese.

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The idea of 'Chain migration' has also been under consideration of scholars tracking global migration flows. Chinese migration historically follows a 'chain' pattern where a first batch of migrants are followed by friends, family and relatives to the destination country (Rush 2018). This family-sponsored migration is a complicated web of resource sharing, China's growing population and a shift in manufacturing processes to China, a phenomenon discussed by Irene Yuan Sun in her book, 'The Next Factory of the World: How Chinese investments

are reshaping Africa'. Sun argues that with rising costs of production in China, manufacturing is largely being offshored to other destinations, and Africa is one of the more promising locations vying to be the 'next factory of the world' (Sun 2017). This manufacturing turn in Africa's development trajectory, according to Sun is a unique moment in history, where growth is directly affected and influenced by independent Chinese entrepreneurs willing to take certain risks that are associated with setting up a factory in Africa, something their western counterparts do not take.

LOANS, DEBT AND RESPONSES TO DEFAULT

The actual financing offered by China represents the most contentious issue. As a broad subject, it is more easily considered when divided into two: the nature and conditions of the loans, and their size and related sustainability. Considering the nature of Chinese loans, it is widely agreed that there is demand for infrastructure finance which has not been met by traditional international sources. Some non-Chinese organisations give low-interest loans to only the poorest countries, excluding the likes of Kenya and Nigeria since they are considered to be middle-income countries, meaning the cost of some projects becomes too high. Negotiations can take many years, with conditions linked to human rights records and structural adjustment programmes limiting uptake. By contrast, China does not consider the income levels of a country but rather the financial viability of the loan, so including middle-income countries (Ryder 2018) is not an issue. The time taken to arrange Chinese loans tends to be significantly lower. As mentioned, China considers resource-based payments, so

offering an alternative repayment structure for those countries with low credit ratings (Ryder 2018). Rather than speaking down to African countries, interactions are framed as South-South cooperation; the willingness to overlook governance issues allows important projects to proceed (Were 2018).

However, there is substantial criticism of general Chinese loan conditions. The tendency – on occasion requirement – that Chinese companies receive construction contracts has already been noted. Less contentious but still worth highlighting is the frequent necessity that borrowing countries support mainland China over Taiwan, so contradicting the claim that loans do not have political prerequisites. Further, there is increased scope for political and diplomatic pressure when a country's dominant creditor is or has ties to a sole sovereign government (CGD 2018). Su (2017) points to a history of China leveraging favourable economic positions for political gain. There have also been instances where seemingly exploitative terms have been tied to financing, Benita Van Eyssen (2018) citing loans to Zimbabwe where Chinese companies were to be exempt from local labour laws, and given first right to exploitation of minerals.

Secretive negotiations and the lack of detail surrounding final agreements contribute to the argument that borrowing countries may be exploited, failing to get value for money. Without the ability for proper scrutiny, doubt is inevitably read into motives, effectiveness, affordability, and debtor understanding. Elsewhere in the Global South, for example Ecuador, 'government ministers have confessed ignorance about the terms of Chinese loans' (Were 2018). Allowing countries to pay through resources rather than cash is not necessarily a positive step, since the

borrower might not be able to extract enough to service the debt, while commodity prices might plunge (Friedman and Snyder 2018). Occasionally loans are collateralised against important assets, often the output of the infrastructure project itself; the most famous example is Hambantota Port in Sri Lanka, a controlling stake of which was subsequently ceded to China on a 99-year lease after Sri Lanka failed to keep up with loan repayments. Fears abound across the African continent that similarly important strategic infrastructure might be taken from sovereign control.

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Turning to the sustainability of debt levels, there is a general concern about the nature of this debt. Although debt ratios are below those which led to debt relief programmes, according to Masood Ahmed, president of the Center for Global Development, current ‘risks are higher because much more of the debt is on commercial terms with higher interest rates, shorter maturities, and more unpredictable lender behaviour than the traditional multilaterals’ (Financial Times 2018). Previous debt crises had a greater share of concessional debt, held by multilateral institutions at better-than-market borrowing rates; today, roughly USD 325 billion of sub-Saharan Africa’s USD 450 billion total debt is private debt (Friedman and Snyder 2018).

The Center for Global Development’s (2018) paper Examining the Debt Implications of

the Belt and Road Initiative from a Policy Perspective, represents the most thorough general examination of the sustainability of African infrastructure debt (CGD 2018). They find that BRI ‘is unlikely to cause a systemic debt problem.’ However, there are particular countries which will have dangerously high debt levels if anticipated BRI projects go ahead. In sub-Saharan Africa, while Ethiopia and Kenya are the only two countries determined to be at ‘significant risk’, it is Djibouti which is highlighted as being of particular concern, one of eight countries globally CGD identify as ‘high risk’. Djibouti’s public debt to GDP ratio has risen from just over 50 per cent in 2013 to almost 90 per cent in 2017; China has provided almost USD 1.4 billion of Djibouti’s infrastructure projects, equivalent to around 75 per cent of GDP, with further projects planned (CGD 2018). Separate from this report, high proportional interest repayments are also cited as an indicator for concern – Moody’s state that interest repayments represent more than 20 per cent of government revenue in Angola, Ghana, Nigeria, and Zambia (Searcey and Barry 2018).

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The full consequences of apparent debt unsustainability will only become clear once China’s responds to any default. Without full membership of the Paris Club, China is not subject to rules binding other sovereign and multilateral lenders, and so will likely take a case-by-case approach (CGD 2018). Existing evidence suggests cause for both concern and optimism.

The case of Hambantota Port has led to fears that similar strategic assets might be claimed in the event of default; as an example, Kenya's Standard Gauge Railway is collateralised against part of Mombasa Port. More critical commentators believe this is either a fortunate by product or conscious strategic underpinning of BRI, where indebtedness leads to the opportunity to increase geopolitical and economic control over Africa. Although China has repeatedly refuted such accusations, fuel was added to this fire by the state-run China Xinhua news tweeting in December 2017 'Another milestone along the path of #BeltandRoad. Sri Lanka officially hands over southern port of Hambantota to China on 99-year lease.' However, there have been several instances of China showing a willingness to renegotiate and extend loans, such as for the Addis-Djibouti railway.

A development to watch in the short-term is the potential for Chinese-held African debt to be repackaged as securities and traded on international markets; as an example, in November 2018 the Hong Kong Mortgage Corporation proposed to buy billions of dollars of infrastructure loans (Liu 2018). While freeing Chinese capital for further infrastructure investment, this would also pose several questions about how African debtors might be treated by creditors.

Ultimately, though, despite misgivings, it appears that many African countries are 'stuck between a rock and a hard place', opting for the conditions contained within Chinese loans since traditional sources of finance are too expensive or restrictive (Ryder 2018). Western critics of Chinese infrastructural financing might well have grounds for their concern, but they should seek to provide sufficiently favourable alternatives (Shepherd and Blanchard 2018).

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THE BELT & ROAD INITIATIVE IN AFRICA

China does not participate in the OECD's Creditor Reporting System and does not share official data on loans, meaning precise lending figures are unknown. However, according to Johns Hopkins University's China Africa Research Initiative (CARI), which has carried out the most meticulous analysis of Chinese state-linked loans and investments, between 2000 and 2017 the Chinese government, banks and contractors extended around USD 143 billion in loans to African governments and state-owned enterprises (CARI 2017). Of this, around USD 80 billion might be termed as relating to infrastructure, having been directed towards communication, power, transportation, and water projects.

The rapid increase in Chinese lending has coincided with the extension of China's Belt and Road Initiative (BRI) to the African continent. BRI represents an effort to improve regional cooperation and connectivity through an extensive network of energy, telecommunications, and transportation infrastructure across 68 countries, linking Africa, Asia, and Europe (Hurley, Morris and Portelance 2018; World Bank 2018). While for Eurasia this consists primarily of overland rail and pipeline connections, for Africa the focus has been on port and internal transport infrastructure projects, special economic zones, and industrial estates (Chen 2018; Were 2018). The Mercator Institute for Chinese Studies' (MERICS 2018) overview,

below, shows the most prominent existing and planned projects.

Thus far, BRI's African focus has been concentrated on East and North Africa, reflected by several high-profile projects, including but not limited to:

- **Djibouti:** Doraleh multipurpose port and Damerjog livestock port construction.
- **Ethiopia:** Addis-Djibouti electric railway; Addis Ababa light railway.
- **Kenya:** Mombasa port extension, Lamu port construction; Standard Gauge Railway linking Mombasa and Nairobi.
- **Tanzania:** Bagamoyo port construction.
- **Uganda:** Entebbe-Kampala expressway.

Chinese infrastructure projects are now being undertaken across the continent, with planned port construction from Senegal to Namibia. Importantly, though not all are branded 'BRI', almost all new major infrastructure projects in Africa are funded by Chinese commercial loans; official BRI designation should not become a fixation (Hurley, Morris and Portelance 2018).

Several reasons have been given for China's increased interest in funding African infrastructural improvements. For a start, it makes economic lending sense, as explained by Columbia Business School's Shang-Jin Wei. When BRI was first proposed in 2013, China held USD 4 trillion in foreign-exchange reserves, earning less than 1 per cent per annum; returns were actually negative when considered in RMB due to its appreciation versus the US Dollar. Thus, although the risk of default remains, 'a cost-benefit analysis shows that the economic case is...very strong' (Wei 2017). Globally, there has also

been an increased appetite for African debt in international markets (Were 2018). With developed markets growing slowly, African growth figures have drawn creditors seeking higher returns expected off the back of growing populations and middle classes, and the high cost of credit domestically; China has not been the only country extending infrastructure loans to the continent.

However, accepting that China's role need not be solely altruistic, beyond these more basic commercial incentives there is a continued polarised debate as to China's motives for lending for infrastructural projects in particular – and the associated risks for African debtors. China's intent is at least partly driven by strategic objectives, but to what extent, how, and what are the consequences?

The positive view of BRI and associated infrastructure financing is well summarised in a speech by Lin Songtain (2018), China's Ambassador to South Africa. This referred to 'win-win cooperation for common development'. It is 'completely different from the Western colonialism', 'does not export ideologies, does not attach political strings, and does not seek the politics of a small circle'; 'certainly there is no such thing called "China first" or "China only".'

Critics suggest a more Machiavellian strategy which seeks to beholden African countries to Chinese influence through 'a carefully laid debt trap' (Harris 2018), former US Secretary of State Rex Tillerson accusing China of 'predatory loan practices' (Brautigam 2018). Some commentators suggest Chinese neo-colonialism: for example, Alemayehu Mariam (2017) of California State University believes: 'In 2017, China cares as much about Africa as the European colonial powers did at the Berlin Conference in 1894.' With supporting

evidence, Mariam goes on to suggest 'creeping neo-colonialism through outwardly benign economic relations and exploitation', matching Kwame Nkrumah's description of neo-colonialism, where investment 'increases, rather than decreases, the gap between the rich and the poor countries of the world (Nkrumah 1965). The suggestion is that China's primary motivation is not 'common development', but expansion of its global influence through economic control. In between these two narratives is space for consideration of the extent to which BRI and infrastructural loans represent a 'win' for both China and Africa, and whether debt levels and loan conditions reflect more selfish motives.

CHINA'S ENGAGEMENTS IN KENYA AND TANZANIA

China's engagement with Kenya is steeped in history, with archeologists tracing remains of Chinese products on the East African Coast as far back as the 10th century. It is largely believed that Zheng He's exploratory voyages in 1419 were the earliest diplomatic contact between the regions (Rice 2010). In modern times, diplomatic ties were established between the nations in 1963 and since then relations have taken significant leaps. There have been several high level diplomatic and political exchanges between the nation with General Liu Jingsong leading China's first military visit to Kenya in 1996 and General Nick Leshan paying a visit to Beijing in 1997. Chinese premier Li Keqiang visited Nairobi in 2014 as a part of his Africa trip and several meetings have taken place between President Xi and President Kenyatta on the sidelines of the Belt and Road Forum and the FOCAC. The Kenya-China comprehensive strategic partnership is expected to provide a blueprint for Chinese engagement not only in the country, but the rest of East Africa (Xinhua 2019). China's interest

in Africa has significantly impacted Kenya: growing trade, people to people contact and more recently infrastructure investments since the unveiling of the Belt and Road initiative. The Standard Gauge Railway (SGR), parts of which are currently operational, is a turnkey project marking the intensification of Chinese presence in the country.

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The project, a part of the BRI, aimed at improving regional connectivity and boosting the local economy extending itself to landlocked Uganda. A study indicates the road highways and railways that Chinese companies are working on: Nairobi-Thika Highway, Airport road in Nairobi, Kipsigak - Serem - Shamakhokho in Rift Valley, Kima-Emusustwi Road and Gambogi-Serem road in Western Kenya. However, it has also come under significant fire from local observers as well as traditional Western partners for creating what is being increasingly viewed as a white elephant project. The sudden retraction of funds from China Exim has resulted in suspension of certain segments of the track and plans to revive a 90 year old colonial line to fill in the gaps. This is apparently a response to allegations against China about creating debt trap economies and loaning money for the construction of unsustainable projects in an attempt to export its excess capacity, a narrative that occupies much of the Western understanding of Beijing's engagement in the continent (Herbling 2019).

This understanding of China's lending process and neocolonialism narrative has affected China's interaction with African countries

especially in multilateral platforms like FOCAC. China's USD 60 billion finance support to Africa, promised in the 2018 summit, has taken the form of 'grants or interest-free loans, and less through interest-bearing credit lines' in an attempt to gain some control over the debt narrative. According to a 2018 report China controls 72 per cent of Kenya's bilateral debt and its rapid penetration of the country's market for manufactured goods is supposedly putting local industries in jeopardy apart from creating a looming trade deficit (Dahir 2018). The value of Kenya's total imports from China in 2018 was USD 3.67 billion while the exports only amounted to USD 1.1 billion (Comtrade 2019). Interestingly, China is also shaping contours of public opinion in Kenya through its several undertakings in media and broadcasting, mainly characterised by private capital. StarTime's success in broadcast infrastructure has been termed as 'soft power campaign' and 'China's political and cultural success story', an opinion that is supported by the flourishing of Confucius institutes in the country (Kaiman 2017)

Tanzania has always been one of China's important partners in the continent. Apart from having ancient ties that date back to the Tsang dynasty (New African 2015) China has been an all weather friend to Tanzania, right through the Socialist era to the more recent spurts of globalisation. The 1970s was the highpoint of the relationship when Tanzania practically led the African consolidated vote in the United Nations to secure China a seat in the Security Council. China's earliest inroad in African infrastructure is marked by the construction of TAZARA in the 1970s connecting landlocked Zambia to Tanzanian ports. Although the now controversial rail network is almost abandoned, it cemented the beginning of a long tryst of

infrastructure investments from China that would subsequently flow into Tanzania. There have been several high-level diplomatic visits from both ends, with Tanzania being the second country President Xi visited after assuming office in 2012. While TAZARA was constructed using Chinese Aid money, most of the current investments are in the form of commercial loans (Nyabiage 2019). Tanzania hoped to benefit from the "Maritime Silk Road" which led to talks about port projects, of which the Bagamoyo port was to be developed by the China Merchants Holding International. The group recently announced that the project has been stalled due to 'disagreement over terms' (Oirere 2019). This is an addition to the list of projects that have failed to take off the ground, or have had successful results after being operational.

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The election of the new Tanzanian president John Magufuli has created several ripples in the narrative of the 'benign BRI'. President Magufuli has called the port project "exploitative and awkward", pointing out that once the port is built Tanzanian officials might have no say in its operation for up to 99 years (Oirere 2019). This is a shift from Tanzania's previous position in FOCAC 2018 where then Prime Minister Majaliwa expressed active interest in being a part of the BRI (AllAfrica 2018). Yet, China continues to remain an important trading partner for Tanzania. Total imports from China in 2018 were USD 1.78 billion and exports amounted to USD 1.45 billion (Comtrade 2019).

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INFRASTRUCTURE AND GROWTH IN AFRICA: THE ROLE OF CHINA

Jumanne Gomera and Uday Khanapurkar

The objective of this chapter is to examine whether China's infrastructure initiatives have a role in the growth and development of the African continent's constituent economies. While more granular analyses of particular cases will follow in the forthcoming chapters, the purpose, here, is to ascertain, firstly, general trends in China's infrastructure initiatives in Africa, and secondly, the relations this bears to economic activity on the continent. Before addressing these issues however, it is necessary to justify why this study focuses on infrastructure as opposed to other sectors of engagement between China and Africa.

As with most inputs, the salience of infrastructure in Africa is a function of scarcity, ie. demand, relative to supply. As such, China's role in providing infrastructure to the continent (and especially the attendant political implications) cannot be adequately understood without examining why African countries require infrastructure (demand side) in addition to why they lack it (supply side). In order to understand the motivations behind the prevailing demand for infrastructure among African countries it is imperative to justify why infrastructure, in particular, is a distinctive element in the economic trajectory of a society with reference to Africa.

THE DEMAND FOR INFRASTRUCTURE

While ascertaining the role that infrastructure plays in an economy has ostensibly proven to be a divisive subject for generations of development economists, a subtle consensus can arguably be gleaned from the discourse over the decades - when utilised correctly, an increase in the stock

of infrastructure generates greater economic growth (Romp and de Haan 2005).

Theoretical backing for this claim is abundant and fairly intuitive. According to one school of thought, hard infrastructure levels, which consist of physical infrastructure such as roads, airports, ports, railways and other mass transit facilities, as well as Information and Communications Technology (ICT) (World Bank 2010), are believed to be inversely proportional to a host of transaction costs (Arrow and Kurz 1970; Barro 1990). Another school emphasises that soft infrastructure, consisting of education and healthcare facilities, and institutional mechanisms, condition the quality and productivity of human capital in an economy. As such, infrastructure facilities benefit not only the productivity of enterprises within an economy but also contribute to aggregate welfare of society. Moreover, public spending on infrastructure is theoretically associated with a "crowding in effect" on private investment (Ahmed and Miller 1999; Ahmed and Miller 2000; Conrad and Seitz 2006), ie. on account of the productivity gains it creates, infrastructure spending induces private investment, as opposed to some other types of government spending which crowd it out by raising interest rates. Others have linked infrastructure to greater specialisation in production (Bougheas et. al. 1999).

As such, infrastructure facilities benefit not only the productivity of enterprises within an economy but also contribute to aggregate welfare of society.

Infrastructure has also been associated with greater growth and productivity by utilising

the popular framework of the 'big push theory' developed by Rosenstein Rodan. According to this theory of economic growth, large, en masse public spending, especially in infrastructure, prompts the entry of a large multitude of manufacturing firms, which in turn lowers the costs that each firm must incur to utilise the facilities, thereby creating a positive feedback loop between infrastructure spending and industrialisation (Murphy, Shleifer and Vishny 1989). The 2005 Report of the Commission for Africa consistently articulates Africa's infrastructure requirements in the lexicon of the big push theory, indicating the popularity of the concept in policy making circles and among world leaders (Commission for Africa 2005). Buttressing the theoretical linkages between infrastructure and growth are a host of empirical works which envisage a more direct relationship between stocks of infrastructure and economic growth, and have also vindicated the intuition.

In a widely influential paper, David Aschauer observed that falling rates of public capital investment in the US - which includes both hard and soft infrastructure - were associated with the declining growth rate in that period (Aschauer 1989). Having opened the floodgates to more rigorous academic analysis of the subject, a slew of data-driven, cross-country studies followed, demonstrating the salutary effects of public capital investment and accumulation on an economy's growth (Munnell 1992; Munnell and Cook 1990; Canning and Pedroni 2008; Canning 1999; Easterly and Rebelo 1993). While the productivity gains generated by infrastructure in developed economies have been treated with a notable amount of skepticism (Holtz-Eakin 1994; Holtz-Eakin 1992), little disagreement exists regarding the effect in developing and underdeveloped economies.

In a meta-analysis of the literature examining the relationship between infrastructure and

growth in 2008, the World Bank found that 63 per cent of the studies reviewed observed a positive relationship between infrastructure and growth and, more importantly, the positive relationship held more frequently in works pertaining specifically to developing countries (Straub 2008). In another such meta-analysis for developing countries, all of the papers reviewed observed a positive relation between infrastructure and productivity and growth (de la Fuente and Estache 2004). Being largely populated by developing economies, this reality is especially pertinent to the case of Africa, and ostensibly forms the conceptual foundation for its appetite for infrastructure.

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A number of studies forcefully drive home the concept of a growth-maximising level of infrastructure, and contend that productivity gains are significantly higher if the investing economy possesses a low stock of infrastructure (Canning and Pedroni 1999; Canning and Fay 1993; Rioja 1998). Poverty in developing economies, as well, was observed to have an inverse relation with various types of infrastructure, albeit to varying degrees (Ali and Pernia 2003; Estache, Foster and Wodon 2002; Calderon and Servén 2008). Calderon and Servén (2014) even found that, in addition to having a positive and statistically significant relationship with income growth, infrastructure spending also facilitated greater distributive equity-a salient policy objective of African countries.

In the particular case of Africa, the infrastructure-growth nexus is in fact less controversial. Investment in transport capital in Africa has been found to be more productive than investment on average, and is associated with large positives for the private sector (Boopen 2006). Similarly, telecommunications infrastructure in Africa has been positively associated with economic growth (Lee, Levendis and Gutierrez 2009; Aker and Mbiti 2010; Donou-Adonsou, Lim and Mathey 2016) and also with increasing returns to scale (Batuo 2015). Both of these results are corroborated by Estache, Speciale and Veredas (2005) in a popular study examining the impact of various types of infrastructure on economic growth in Sub Saharan Africa. Furthermore, infrastructure spending in Africa has been found to be a significant factor in attracting much-needed FDI, and thereby generating economic growth (Babatunde 2011; Khadaroo and Seetanah 2009). Additionally, vindicating the theory of the crowding-in effect, Richaud, Sekkat and Varoudakis (1999) observe that “positive externalities account for about 25 per cent of total gains generated by an infrastructure investment” in Africa, and act as a “transmission channel of growth among neighbouring countries.”

Given the demonstrable benefits of infrastructure stocks, growing economic activity in Africa has increased its appetite for infrastructure commensurately. However, despite the consensus surrounding the benefits of infrastructure accumulation in Africa, budgetary constraints, fragmentation and other structural disadvantages have precluded the proverbial ‘big push’ and economic transformation has long eluded the continent’s economies (Collier 2006). Economic growth has not been accompanied

by an increasing manufacturing output share and a shrinking share of agriculture, as would generally be expected (Ajakaiye and Ncube 2010). More recent data from the World Bank illustrates that this stagnation has sustained over time (See Table 2.1). This outcome has been attributed to the supply side and Africa’s glaring infrastructure deficit, which the following section examines in detail.

Table 2.1: Structural Composition of GDP, Sub Saharan Africa

	2000	2010	2017
Services, value added	51	52	53
Manufacturing, value added	13	10	10
Agriculture, forestry, and fishing, value added	19	17	16
Industry (including construction), value added	34	26	23

Source: World Bank (2019), Open Data

THE SUPPLY SIDE-AFRICA’S INFRASTRUCTURE DEFICIT

Like all developing countries, the stock of infrastructure in African economies trails behind the remainder of economic activity, condemning its constituent economies to operations at a level lower than capacity. The extent of this deficit in infrastructure, and the rate at which it has expanded over the last two decades, sets Africa apart. Estimates made in 2005 that were supported by the World Bank pegged Africa’s infrastructure spending requirements at USD 40 billion per year which was 4 per cent of the continent’s GDP at the time (Estache 2005; World Bank 2009). Three years later, in 2008, a World Bank report estimated the gap to have risen to USD 75 billion (Foster 2008). At the end of the decade, estimates were reassessed by the Africa Infrastructure Country Diagnostic

project (AICD) set up by the Infrastructure Consortium Africa (ICA), and driven up to 15 per cent of African GDP at USD 93 billion per year (Foster and Garmienda 2010; AfDB 2011). The AICD report, however, gives this number as a requirement for reducing disparity with developed countries and not attaining universal access to infrastructure facilities. More recently, the Africa Development Outlook 2018 gauges Africa's infrastructure requirements for optimal access as ranging anywhere between USD 130 and 170 billion, far exceeding previous estimates (AfDb 2018).

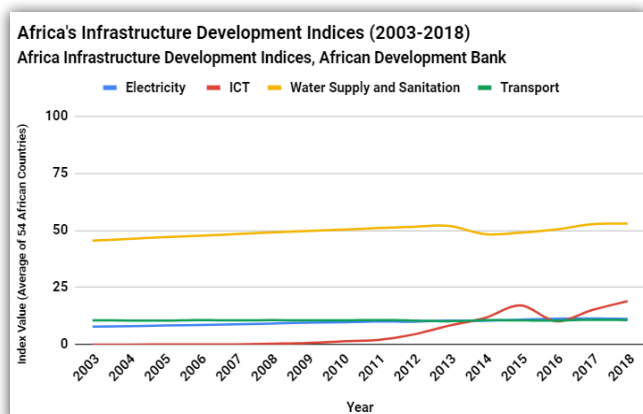
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Rough estimates abound for the costs to growth that are incurred on account of the persistent infrastructure gap. At the firm level, productivity in Africa reportedly fell 40 per cent due to infrastructure inadequacy (Foster 2008). Esfahani and Ramirez (2003) found at the start of the millennium, that if Africa's growth in power and telecommunications had been as much as East Asia's, growth in per capita income would have been 0.9 per cent higher than otherwise. Another study during the same time observes that if infrastructure stocks in African countries were the same as those in South Korea, continental growth per capita would be 1.04 per cent more on average (Calderon and Serven 2004 quoted in Estache 2005). The 2018 AfDB report pegs the costs even higher, at two per cent of per capita income, on average (AfDb 2018).

The most glaring deficiency prevails in the domain of power generation and distribution (Yepes, Pierce and Foster 2008). As per 2003 data, access to electricity is abysmally inadequate with an access rate of only 46 per cent as compared to 88, 100 and 99 per cent in Asia, Europe and Latin America respectively (AfDB 2018). By 2014, this had climbed by only one percentage point. Furthermore, regional disparities are huge - figures that exclude the wealthier economies of North Africa are likely to reflect even lower infrastructure facilities. Foster and Garmendia (2010) estimate that power shortages shave off anywhere between one and two percentage points off of Africa's GDP. As of 2011, only 15 per cent of Sub Saharan Africa's roads were paved (Kodongo and Ojah 2016). Similar shortfalls exist in railways, ICT, water supply, sanitation etc (Kodongo and Ojah 2016; AfDb 2018; Foster 2008).

More contemporary insights can be drawn from the Africa Infrastructure Development Index constructed by the AfDB, which includes composite indicators ranging from 0 to 100 for electricity, transportation, ICT and water supply and sanitation in all 54 countries of Africa. Figure 2.1 depicts the average composite index for each infrastructure type of all African countries during the period 2003-2018. The indices for electricity and transport languish at a remarkably low base of 10 and close to no improvement has taken place in either measure over the 15 year period. While the ICT index has, indeed, shot up, it has done so from an extremely low, near-zero base and much is left to be desired.

Figure 2.1



The lack of infrastructure in Africa and the inertia witnessed in its development, has a multitude of causes. It has been contended that the ultimate cause can be traced back to Africa's colonial history (Acemoglu and Robinson 2012). While Western colonialists did contribute to Africa's stock of infrastructure by constructing ports and railways (Jedwab and Moradi 2012; Settles 1996), these were largely interior-to-coast facilities whose primary purpose was the transportation of natural resources out of the continent (Sachs et.al. 2004; Okoth 2006; French 2014). According to one author, "two thirds of the African railways built in the colonial period connected mines to a coastal harbor" (Platteau 1996 quoted in Sachs et.al. 2004). The colonial powers also used different gauges in order to monopolise the gains from infrastructure and deter invasion from other colonialists (Forsyth 2005). Africa's anemic levels of regional integration have been empirically linked to the colonialists' extractive modus operandi (Bonfatti and Poelhekke 2012). Effectively, natural resource exports were thus rendered the only profitable preoccupation for a number of African countries, depleting the incentive and ability to invest in infrastructure. Colonial contributions to African infrastructure have thus been considered "incomplete," and not of the beneficial kind (Arewa 2016).

Spawning from this legacy are a host of proximate causes for Africa's poor infrastructure that are of a structural nature. The African Development Bank identifies corruption, lack of legal and institutional frameworks as well as deficient human capital as the more immediate causes of the infrastructure deficit (AfDB 2018). Corruption, for instance, is a direct result of the de industrialisation concomitant to a primary dependence which reinforces the status quo by rewarding rent-seeking behaviour and stifling institutional reforms. As a result infrastructure development in Africa has taken place largely through concessional debt as opposed to foreign investment, and construction has been significantly constrained by the continent's internal fiscal exigencies (Sobjak 2018; AfDB 2018). In the case of Africa's state-owned railways, institutional inefficiencies such as lack of autonomy and mismanagement are considered responsible for the uncompetitiveness (Gwilliam 2011). Fragmentation in Africa, election-oriented infrastructure planning and the prioritisation of narrow national interests over regional ones is also responsible for the persistent infrastructure deficit.

The African Development Bank identifies corruption, lack of legal and institutional frameworks as well as deficient human capital as the more immediate causes of the infrastructure deficit (AfDB 2018).

As a result of this, plugging the infrastructure gap has long been a top priority for the economies of Africa. The Africa Infrastructure Country Diagnostic chaired by the AU Commission, was founded in 2005 in order to conduct extensive research on Africa's infrastructure imperatives, with a comprehensive report being released in 2009 (AfDB n.d.). In 2012, the African

Union (AU) Heads of State and Government endorsed the Programme for Infrastructure Development in Africa (PIDA), a joint initiative of the African Union Commission (AUC), the New Partnership for Africa's Development Planning and Coordination Agency (NPCA), and the African Development Bank (AfDB). Under PIDA, Africa's infrastructure gaps were meticulously mapped and plans for the short, medium and long terms respectively were set with an emphasis on regional integration and African unity. The objectives and aims of previous frameworks such as the NEPAD Short Term Action Plan, the NEPAD Medium to Long Term Strategic Framework and the AU Infrastructure Master Plan were consolidated under this single policy document. Under PIDA, the Priority Action Plan (PAP) aimed at pumping a total of USD 68 billion into infrastructure by 2020, while the target for 2040 has been estimated at USD 360 billion (PIDA). Nevertheless, while African countries have gained proficiency over the years in mobilising domestic resources for infrastructure spending, it has been consistently below requirements, thereby necessitating external assistance (AfDB 2018). Overseas financiers have played a large role in Africa and have been acknowledged profusely in Africa's infrastructure policy.

Precise numbers for national spending of African countries are hard to come by, making it difficult to discern the split between external and internal finance for infrastructure. According to the IMF, external funding for infrastructure in Africa accounted for 37 per cent of total funding in 2012 (Gutman, Sy and Chattopadhyay 2015). The AfDB offers an even higher estimate for the year 2016 - roughly half of Africa's total infrastructure financing commitments were said to have been made

by external financiers including multilateral and regional financial institutions as well as funders from Asia and Europe (AfDB 2018). During the 1990s Africa's external financing for infrastructure came almost entirely from Official Development Finance (ODF), consisting of loans by multilateral development banks such as the World Bank and the African Development Bank as well as finance extended by the European members of the Infrastructure Consortium of Africa (ICA) (Dollar 2016).

The USA's engagement with Africa, in particular was undertaken largely via international financial institutions. With the turn of the century however, external finance has undergone a diversification, with private investors and the Chinese gaining share quite rapidly. As per the African Economic Outlook report for 2018, Chinese funding now accounts for 20 per cent of the total, making it the single largest financier of African Infrastructure (AfDB 2018). Competition from China has changed the dynamic of infrastructure financing dramatically. France, for example, which was a prominent supplier of infrastructure to Africa owing to colonial-era ties, has been compelled to lower its aid and restrict construction activities to areas where it enjoys a comfortable competitiveness margin, namely agriculture, clean energy and water supply and sanitation (Melly and Darracq 2013).

As per the African Economic Outlook report for 2018, Chinese funding now accounts for 20 per cent of the total, making it the single largest financier of African Infrastructure (AfDB 2018).

While China's role as a financier of Chinese infrastructure has undeniably posted a dramatic increase, finance is but one component of its infrastructure development

on the continent. For instance, Chinese private companies are also undertaking projects in Africa without necessarily providing loans to national governments. Moreover, some Chinese contracting companies are working on finance from international financial institutions of the West. As such, while conceptualising China's infrastructure development in Africa, it is necessary to account for these other modes of engagement as well. This is covered in more detail in the next section.

CHINA'S INFRASTRUCTURE DEVELOPMENT IN AFRICA- GENERAL OVERVIEW AND TRENDS

On account of the numerous ways in which infrastructure provision can be conceptualised, defining and operationalising the term is imperative for the scope of this study and a prerequisite to analysing general trends. 'Infrastructure' is a nebulous catch-all term that could apply to anything that brings down transaction costs and, therefore, boosts productivity in an economy. As such, it includes physical elements such as connectivity and telecommunications infrastructure (hard infrastructure) as well as less direct enhancers of productivity such as healthcare, education, contract enforcement and even other less-tangible institutional aspects such as transparency and standardised procedures (soft infrastructure). This heterogeneity means that some components of infrastructure are more easily measurable than others, resulting in the requirement to use quantifiable proxies while broadly analysing infrastructure as a key variable (more specific analyses on particular cases will be performed in the coming chapters).

For the broad analysis which is the subject of this chapter, revenue data of Chinese

construction companies (values of contracts signed), as it accrues to Africa, is used as a broad measure of China's infrastructure activities on the continent. This data, collected by the China-Africa Research Initiative at the School of Advanced International Studies (SAIS), Johns Hopkins University, is a fairly close proxy for the variable at hand. In order to qualify this claim, it is necessary to offer a commentary on the precise manner and form in which China engages with Africa in the context of infrastructure.

Firstly, since China's infrastructure activities in Africa are largely concentrated in the domain of hard infrastructure, using revenues of construction of Chinese companies in Africa as an indicator of China's engagement in the sector does not particularly run the risk of omitting soft infrastructure. As per data released in a report by the Infrastructure Consortium for Africa (ICA) in 2017, 89.3 per cent of China's infrastructure commitments to Africa in the period 2012-17 fell under the hard sub-categories of transport, energy, water and ICT (ICA 2017). This is intuitively palatable - soft infrastructure, comprising of institutional and structural elements are less likely to be as exportable as hard infrastructure, particularly in the short-run. Therefore, while soft infrastructure plays an undeniably integral role in productivity, China's complementarity with Africa lies more in the realm of hard infrastructure.

Secondly, it is imperative to clarify that an overwhelming majority of China's infrastructure activities in Africa are not conducted in the form of Foreign Direct Investment (FDI), and therefore cannot be adequately captured by investment data released by China's Ministry of Finance and Commerce (MOFCOM). China's

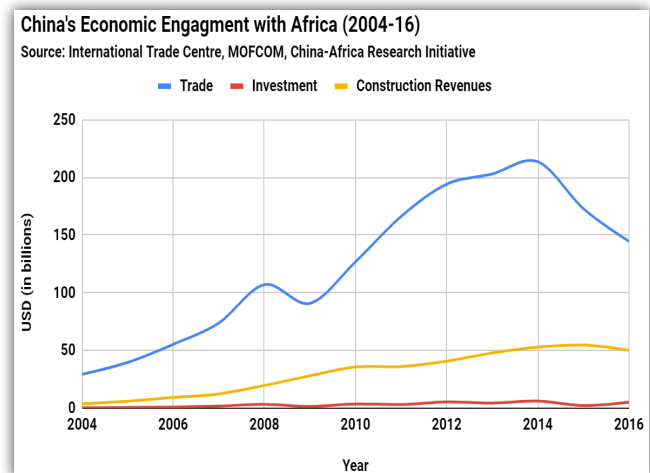
investment activity in Africa, which is the smallest among the world's continents and has been relatively stagnant from a low base (Zoo 2018; Nutter 2017; Yun 2014), actually belies the extent of engagement in infrastructure. Pairault (2018) illustrates that construction revenues of Chinese companies from Africa were 25 times the FDI outflow figures in the year 2016, thus driving home the point that China's infrastructure engagement in Africa is primarily comprised of contracting services as opposed to investment. Figure 2.2 depicts China's trade, investment and construction revenues with Africa and illustrates this point. Furthermore, a 2018 Deloitte report found that Chinese infrastructure in China averaged USD 11.5 billion in the period 2012-16 - construction revenues in Africa during the same period averaged 4.3 times that figure, at USD 49.3 billion (Deloitte 2018). Much of the commentary on the subject appears to conflate China's financing commitments towards African infrastructure - which is essentially debt provided to avail contracting services - with investment.

Pairault (2018) illustrates that construction revenues of Chinese companies from Africa were 25 times the FDI outflow figures in the year 2016, thus driving home the point that China's infrastructure engagement in Africa is primarily comprised of contracting services as opposed to investment.

Moreover, with equity purchases of resource extraction and mining firms forming a salient part of Chinese investments in Africa (Dollar 2016), using it as a measure of infrastructure, or even including it, would be inappropriate. Similarly, funding commitments made by China to Africa in a particular year may or

may not reflect actual construction, nor do they include the entire gamut of private sector engagement in infrastructure. Trends in the revenues of Chinese infrastructure companies, which generally begin construction upon fund disbursement, are more likely to reflect the development of infrastructure on the ground.

Figure 2.2



Nevertheless, this measure is far from perfect, and two of its limitations are immediately apparent. Firstly, being in dollar terms, it fails to account for the heterogeneity in infrastructure, which has been observed to be a significant predictor of growth (Estache, Speciale and Veredas 2005). Moreover, the measure is significantly dependent on the terms of negotiations between the suppliers and consumers. The case of Chinese railway constructions in Kenya and Ethiopia illustrate this lacuna - Ethiopia's longer, more modern railway line has cost Addis Ababa a sum not much in excess of that of Kenya's less sophisticated SGR (Kacungira 2017). Secondly, it cannot indicate whether hard infrastructure, once supplied, is used in an effective manner by its African recipients. This is a particularly glaring limitation since Hulten (1996) finds that more than 40 per cent of the growth differential between Africa and East Asia is attributable

to the varying degree of efficiency with which infrastructure resources are utilised. Even so, these limitations will be mitigated, to some extent, in the case-study approach adopted by the subsequent chapters.

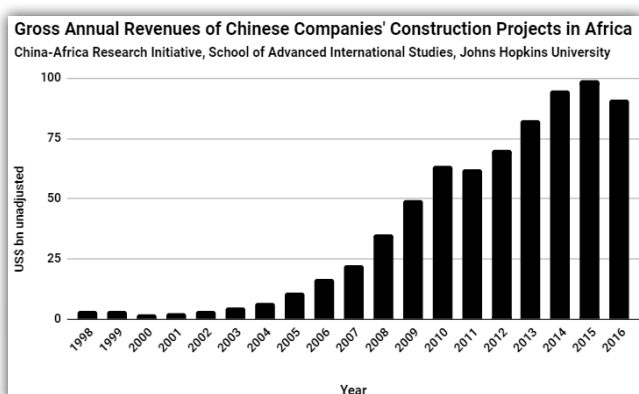
CONSTRUCTION CONTRACT TRENDS, 1998-2016

Proceeding to the trend analysis, Figure 2.3 displays annual construction revenues of Chinese firms in Africa for the period 1998-2016. As is observable, contract values have risen fairly consistently since 1998 with minor reversals in 2011 and 2016, both of which can be explained by the business cycle and strengthened investment regulations. China's infrastructure activities in Africa recorded a swift uptick particularly after the National Development and Reform Commission's (NDRC) 2004 bulletin encouraging the financing of projects in Africa (United Nations 2007). Posting a Compound Average Growth Rate (CAGR) of 28.9 per cent during this period, infrastructure construction has clearly been on a secular upward trend during the period in question. This is in stark contrast to investment figures which, as mentioned above, have remained relatively low and stagnant.

As a result, China's contribution to Africa's stock of infrastructure during the period 2003-2016 period amounted to an overwhelming USD 408.8 billion - the comparable figure for outward FDI is a meagre USD 39.9 billion (MOFCOM 2018).

To be sure, it is uncertain whether this growth can continue, in light of the macroeconomic headwinds China has come to expect in recent years (Partington 2019). Going forward, China's financing activities in Africa promise to be increasingly subject to its domestic economic fundamentals. Downward pressure on the Chinese economy will likely compel its policymakers to devote its shrinking credit capacity to maintain internal buoyancy, stifling the growth of China's capital commitments to Africa. Hints of this have already surfaced - China's commitments to Africa during the Forum on China-Africa Cooperation (FOCAC) in 2018, for example, were less concessional and stood at the same level as those made during the 2015 Forum, bucking the trend of manifold increases in subsidised lending that were promised during previous iterations (Yun 2018). Additionally, with China's impending slowdown promising to suppress commodity prices on which African economies are dependent, their creditworthiness is also likely to take a hit and deter lending.

Figure 2.3



China's commitments to Africa during the Forum on China-Africa Cooperation (FOCAC) in 2018, for example, were less concessional and stood at the same level as those made during the 2015 Forum, bucking the trend of manifold increases in subsidised lending that were promised during previous iterations (Yun 2018).

Furthermore, China's stimulus options are also not particularly conducive to increases in

financing activities in Africa. With its debt to GDP ratio at dizzying heights and an urgent imperative to deleverage, China's policymakers are more likely to opt for greater fiscal stimulus as opposed to credit expansion (Tang 2018), leaving little room for greater capital injections into Africa. China's plans to replace debt-financing with equity investments in Africa will likely mitigate the drop in financing to a certain extent. Although, only USD 10 billion of the 60 billion committed during the 2018 FOCAC are allocated to such investments (Xinhua 2018), China's private sector champions appear willing to pick up part of the tab. Huawei, for example has committed to invest a billion, out of the ten, over the next three years (Reuters 2018). Alibaba is reportedly slated to follow suit (Forbes 2017). Additionally, apart from FDI, Huawei and ZTE, have commissioned more than 40 fibre optic projects valued at USD 13 billion in the period 2015-2018 (Olingo 2018). Nevertheless, investments are also likely to be restrained by returns imperatives in the face of a slowdown in 2019.

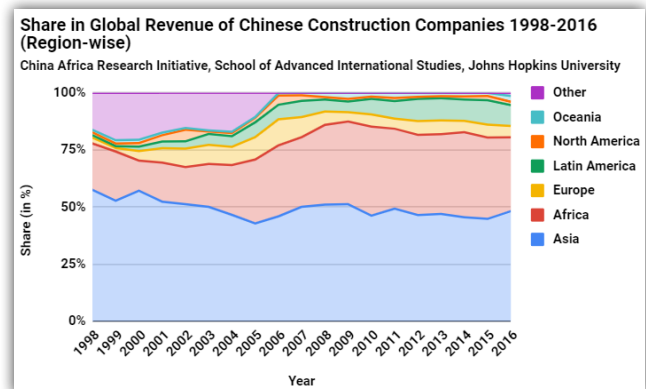
External dynamics could also emerge as an obstacle to the maintenance of the trend. Particularly influential could be the USA's newfound commitment to countering Chinese influence in Africa, as expressed in the Trump Administration's Africa Strategy of December 2018 (Schneidman and Signe 2018). Opposition to and competition with, China's infrastructure initiatives in Africa, should it manifest in discernable form, could reduce construction revenues of Chinese companies. While part of this would be explained by an improvement in the price or terms of negotiations between African countries and China, a certain level of attrition could be expected in the quantity of infrastructure supplied as well. Given these realities, while China will certainly contribute to

an increase in Africa's stock of infrastructure, the rate at which it does so is unlikely to match that of previous years.

AFRICA'S SALIENCE IN CHINA'S GLOBAL CONSTRUCTION CONTRACTS

Not only has China's construction activity in Africa during the last two decades increased in absolute terms, but it has also increased relative to other destinations where the Chinese build infrastructure. Figure 2.4 depicts the share in global revenues of Chinese construction companies, in various parts of the world, for the period 1998-2016. For most of this period, Africa has been China's second largest source of construction contracts. Naturally, construction in Asia accounts for the largest share during this period. However, Asia's overwhelming preponderance has been gradually whittled down by Africa, whose share in revenues rose to 32.3 per cent in 2016 from 20.2 per cent in 1998.

Figure 2.4



It is worth asking why the salience of Africa in China's construction contracts rose considerably more, relative to other developing parts of the world such as Asia and Latin America where demand for infrastructure is high. To this end, it is useful to acknowledge China's overseas infrastructure development as an export of a service and a continuation

of its Export Led Growth strategy. The case of Asia is, therefore, fairly simple to explain - the market for infrastructure in China reached saturation, particularly in the aftermath of the stimulus delivered to the Chinese economy in response to the financial crisis in 2008. Africa's salience relative to Latin America, however, requires more elaboration.

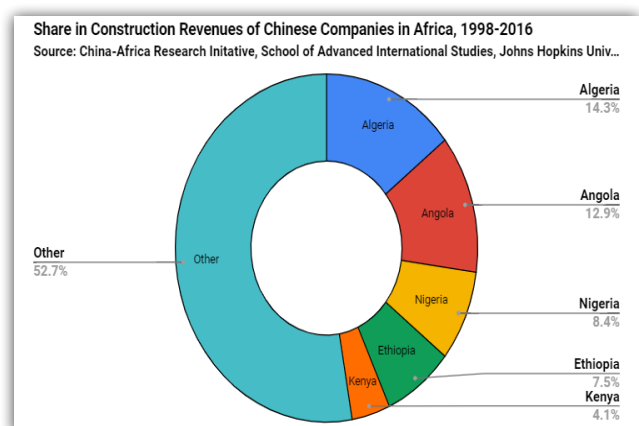
When understood as a service export, it is self-evident that while investments are dependent, for the most part, on the mobility of capital, China's overseas construction activities depend on the mobility of a larger range of factors of production. As such, the discrepancy in the salience between Africa on the one hand and Latin America and Asia on the other is explained by a multitude of contingencies. First, and most rudimentary, geographical proximity plays a significant, albeit partial, role in determining transaction costs of an export, based on the assumptions of the popular gravity model of exports in international economics. Additionally, the scarcity factor arguably plays a large role - gross capital formation per capita in Africa is about half of Latin America's and less than a third of Asia's (AfDB 2018). Labour is another factor that leads to increased transaction costs for the export of infrastructure to Latin America relative to Africa - while, to a certain extent, Chinese labourers (managers, in particular) are utilised towards construction in Africa, such a substitution of domestic labour is often not tolerated in Latin America (Ferchen 2015; Mendez 2016). China has also had to compete for markets with the US and Europe, which have a comparative advantage in Latin America (again due to proximity), although this situation appears to be changing (Nolte 2018). In Africa, on the other hand, China derives an advantage relative to the West on account proximity and anti-colonial sentiments.

Assessing the distribution of China's global construction contracts going forward is not easy. While a slowing economy, as mentioned above, could prompt China to devote more attention to infrastructure in its periphery, the BRI is increasingly inspiring ambivalence within Asian governments. Construction in Latin America could very well eat into the shares of Asia and Africa in such a scenario, although in absolute terms the hierarchy is likely to sustain.

REGIONAL DISTRIBUTION OF CONSTRUCTION WITHIN AFRICA

China's construction activity in Africa has remained fairly concentrated in certain countries. During the 1998-2016 period, 47.2 per cent of construction revenues accrued from five countries - Algeria, Angola, Nigeria, Ethiopia and Kenya, in that order (See Figure 2.5). The first three out of these accounted for 35.7 per cent of all construction activity. Prima facie, this would appear to vindicate the oft held claim that China's infrastructure development in Africa is primarily motivated by energy security imperatives.

Figure 2.5



A number of academic studies analysing Chinese outward FDI to African countries, for example, observe a statistically significant relation between investment and natural

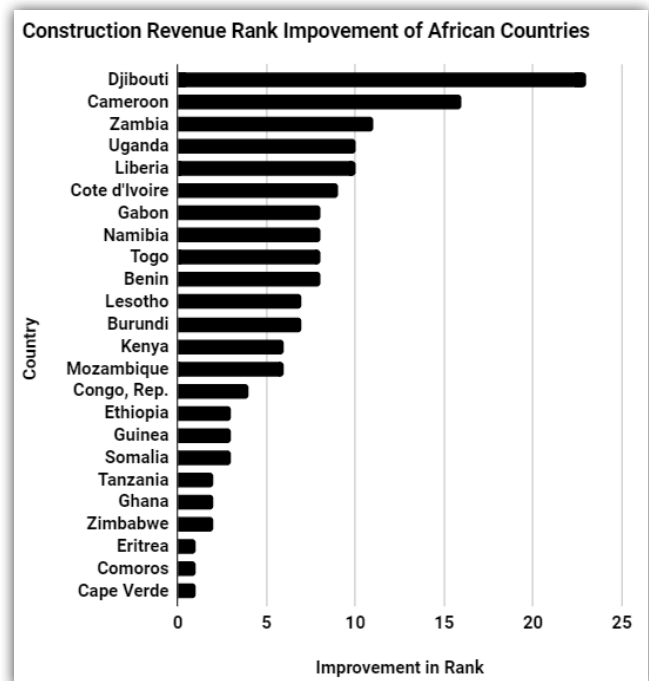
resource stocks (Kolstad and Wiig 2011; Shoham and Rosenboim 2009; Soumare, Gohou and Kouadio 2016). Broad reportage has subscribed to this view and policymakers as well have come to diagnose China's engagement with Africa in this manner (Forbes 2017; Yun 2014; Albert 2017; Economy and Levi 2014). However, while static analyses of construction and investment trends in Africa appear to support the argument for extraction, a dynamic analysis offers more insights into China's changing priorities.

In order to perform a dynamic analysis, the time period was split in two components, the first being from 1999-2011 and the second from 2012-2016. Chinese construction revenues in 53 African countries during the two respective time periods were ranked. The change in rank of each country from the former period to the latter was calculated and is depicted in Figure 2.6. Out of the 24 countries that recorded an improvement in their rank, only five - Cameroon, Côte d'Ivoire, Gabon, Republic of Congo and Ghana - were major oil producers, while one - Zambia - was a major cobalt producer. Moreover, while the 1998-2011 period saw Libya and Sudan - both oil producing countries - occupy the third and fifth spot respectively, during 2012-16 these had been replaced by two non oil-producing countries, Ethiopia and Kenya. While resource security is certainly a priority for China in Africa, it has come up against another economically crucial imperative - that of deleveraging its construction companies while domestic demand for infrastructure languishes.

Chinese construction companies were encouraged to engage in extensive domestic infrastructure building following the 2008 financial crisis in a bid to maintain demand and buoyancy in the economy. Naturally, this injection was financed through debt and

low interest rates. While demand remained robust in the short run due to this stimulus, the infrastructure market was quickly saturated and construction companies were left with large debt obligations. Unable to generate revenues within China in order to service their debt, these construction companies have turned to the developing world and Africa in particular.

Figure 2.6



As such, in the aftermath of the 2008-09 economic stimulus, China's efforts in many parts of Africa has been to gain market share in local construction and infrastructure markets by leveraging its competitiveness. In illustration of this, Deloitte, in 2016, reported that while China funded 12.6 per cent of infrastructure projects during that year, it built 22.4 per cent of them, becoming the largest non-African contractor (Deloitte 2016). This particular motivation will be covered in greater detail in subsequent chapters. That China, since the 2008 stimulus, is undertaking construction in Africa for its own sake, is also suggested by the sub-regional distribution of construction contracts within the continent as depicted in Figure 2.7.

As such, in the aftermath of the 2008-09 economic stimulus, China's efforts in many parts of Africa has been to gain market share in local construction and infrastructure markets by leveraging its competitiveness.

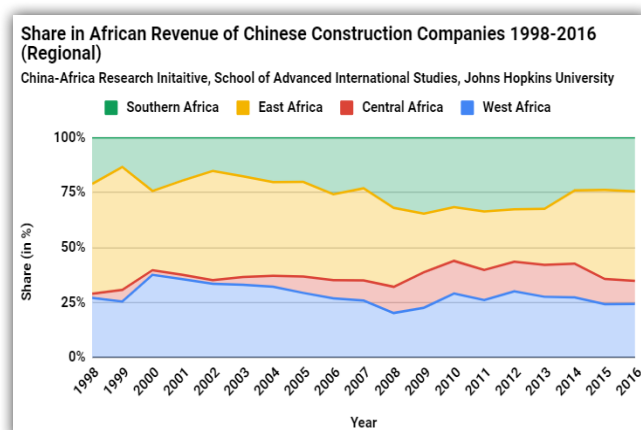
In the period prior to 2012, Chinese construction contracts appear to have shifted their concentration away from relatively resource-scarce East Africa, in favour of the oil and mineral abundant regions of Southern and West Africa (Angola and Nigeria, in particular). In 2009, Southern Africa attracted 34.7 per cent of Chinese construction contracts and overtook East Africa, whose share had fallen to 26.7 per cent from 50 per cent in 1998 - a trend driven almost entirely by construction in oil-rich Angola in Southern Africa. After 2012, however, the share of East Africa in Chinese construction began to recover at the expense of each of the other three regions. Construction revenues in both Angola and Nigeria fell during this period. Therefore, while resource extraction continues to be a mainstay in China's infrastructure engagement with Africa, the data suggests that China's interests in the region have undergone a rebalancing.

CHINA'S INFRASTRUCTURE DEVELOPMENT IN AFRICA- STATISTICAL RELATION WITH ECONOMIC PARAMETERS

While China is undeniably playing a significant role in plugging Africa's large infrastructure gap, that these projects bear a positive association with desirable economic outcomes is not a foregone conclusion. As noted at the start of the chapter, an economy faces a growth maximising level of infrastructure, at a particular point of time. Therefore, whether or not an economy is able to translate infrastructure resources into economic development is incumbent on what can be called its absorptive capacity at that point in time. This is particularly true in the case of foreign financing and can be elucidated by way of a hypothetical example. An infrastructure-scarce economy with a low level of economic activity could bridge its infrastructure gap by borrowing internationally and facilitating construction. However, should economic activity fail to live up to expectations, for whatever reasons, the government will be compelled to service the debt through tax hikes or bond sales, both of which are leakages from the economy and contribute to deflationary pressures. In such a scenario, the net effect of an endeavour to plug the infrastructure gap could ultimately stifle positive outcomes. As such, whether China's infrastructure development in Africa is associated with broader economic development is not simply a function of the extent to which it has remedied the continent's infrastructure gap. It is, rather, an empirical matter.

Convention would entail performing cross-country panel regressions of GDP levels of African countries on the stock of infrastructure contributed by China at a given point in

Figure 2.7



time. Most of the studies cited at the start of the chapter adopt this method. However, this study takes a different track, focusing more on broader development. According to Kodongo and Ojah (2016), increments to the stock of infrastructure in regions such as Sub Saharan Africa “where traditional antecedents of economic growth are either significantly inadequate or lacking,” are likely to contribute to growth in an indirect manner. Another way of understanding this is that increases in infrastructure stocks may improve conditions of certain development indicators which may or may not be entirely in sync with GDP growth, but are desirable nonetheless. As such, observing the association between China’s infrastructure stocks and economic growth might not serve the purposes of this study. Instead, this chapter focuses on two development indicators most germane to the case of Africa: industrialisation and regional integration. This allows for the exploration of the channels through which infrastructure contributes to economic development. The relation between innovation in Africa and China’s infrastructure development will be discursively addressed in the case study chapters. This chapter will restrict itself to observing the empirical relation between China’s infrastructure development in Africa and industrialisation and regional integration respectively.

INDUSTRIALISATION

Sustainable growth in African countries is incumbent on their success at industrialising their economies. The impact infrastructure is expected to have in Africa is, in fact, often that of growth via structural transformation as opposed to growth for its own sake (AfDB 2018). According to the Africa Economic

Outlook 2018, industrialisation will be imperative to alleviate poverty as well as to achieve near full employment with 12 million individuals joining the workforce every year. This outcome has long eluded the economies of Africa. As observed in Table 2.1, manufacturing value added as a percentage of GDP for Sub Saharan Africa has actually fallen since 2000. Africa’s deindustrialisation has received a fair deal of academic attention. An excessive dependence on primary sector exports for economic growth is considered one of the main causes of what has been called Africa’s ‘pre-industrialisation deindustrialisation’ (Tregenna 2015).

Also known as the ‘Dutch Disease,’ the consensus among development economists is that resource endowments tend to negatively affect development outcomes, through a multitude of channels (Sachs and Warner 1995). Volatility in commodity prices, for instance, deal unpredictable shocks to resource exporting economies and preclude extensive business activities which demand stability. Additionally, large inflows of foreign reserves that accrue from resource exports generally cause the domestic currency to appreciate, rendering the remainder of the manufacturing export base less competitive in foreign markets (Fleming, Measham and Paredes 2015). Another study identifies as many as nine ways by which resource endowments contribute to low growth which include corruption, rent seeking and inducements to conflict (van der Ploeg 2011). As such, resource demand from China has undeniably been a factor in Africa’s industrialisation woes in the last two decades.

Not only has demand from China enabled the entrenchment of the primary sector in Africa, but imports of cheap manufactures

from China have reportedly crowded out local manufacturers, resulting in more downward pressure on industrialisation (Deloitte 2015; Broadman 2007; Kaplinsky, McCormick and Morris 2010). Moreover, it has been questioned whether African leaders possess complete agency over their economies' dependence on Chinese resource demand, in light of the structural exigencies that arise from abundant resource endowments (Phillips 2019). Nevertheless, China's engagement with Africa has undergone a notable transformation, particularly during the recent decade. For example, structural shifts in China itself, wherein costs faced by Chinese manufacturers are increasing and prompting the migration of capital to low cost locations, have reportedly proven propitious for African industrialisation (Brautigam, Tang and Ying 2018). It has been contended, for instance, that China is actively pursuing an African industrialisation strategy (Pilling 2017).

Not only has demand from China enabled the entrenchment of the primary sector in Africa, but imports of cheap manufactures from China have reportedly crowded out local manufacturers, resulting in more downward pressure on industrialisation (Deloitte 2015; Broadman 2007; Kaplinsky, McCormick and Morris 2010).

More importantly, as discussed in the previous sections, China's engagement with Africa is now characterised by an increased focus on infrastructure development. With China's infrastructure development in Africa having substantially increased in the last decade, leaders and policymakers in both regions unequivocally contend that industrial activity has been catalysed due to the projects.

Chinese leaders and policymakers have placed particular emphasis on their commitment to enabling speedy industrialisation in Africa (Jun 2016; Xinhua 2018). As such, empirically examining the relation China's infrastructure development in Africa has with levels of industrialisation on the continent will shed light on whether reality matches the rhetoric.

To this end, a cross-country regression analysis is conducted on a panel sample of 45 African countries (see Appendix) for the years 2003-2016. As such, the unit of analysis employed in this study is the country-year, for example Tanzania 2000, Kenya 2016. A total of 617 country-year observations were thus obtained. While Africa consists of 54 countries, data for Low Income Developing Countries (LIDCs) is generally scant and requires some countries to be dropped from the sample. Additionally, Eswatini was dropped in lieu of its diplomatic ties with Taiwan, making it an outlier within the sample. China's infrastructure development, as in the section above, was coded as construction contract revenues in each of the 45 countries every year. This is in line with the contention of Kodongo and Ojah (2016) who observe that increments in infrastructure stocks are responsible for the variation in growth as opposed to the stock level. Industrialisation was defined as the Manufacturing Value Added as a percentage of GDP (MVA) for each country-year. The statistical model includes certain commonly utilised control variables in order to best mitigate omitted variable bias. Definitions and sources of the data used in the modelling as well as the tests used are detailed in the Appendix. The Hausman test indicates that the results of the fixed effects model are relevant to this model. Table 2.2 discloses the results of the statistical tests performed.

Table 2.2 - Model of China's Infrastructure Development in Africa and Industrialisation

Variable		Pooled	Fixed Effects	Random Effects
Chinese Construction Contracts	B p	0.000914 0.078	-0.017741 0.000	-0.0018344 0.000
Energy Consumption		-0.2134292 0.021	-0.1899673 0.280	-0.2365545 0.126
Trade Openness		.12306 0.000	0.033668 0.000	0.0411738 0.000
Gross Domestic Product (current USD)		3.85e-11 0.000	1.44e-11 0.014	-1.53e-11 0.009
Gross Domestic Product Per Capita		0.0023977 0.000	0.0005565 0.001	0.0007075 0.000
Gross Domestic Product (Logged Value)		3.590201 0.000	0.8965588 0.136	1.245629 0.023
Constant		-68.07692 0.0000	5.206773 0.714	-3.403919 0.793
R-squared		0.5332	0.2890	0.3641
N		617	617	617

Note. Results computed using Stata 13.0

Contrary to expectations, the results depict a statistically significant, negative relationship between China's construction revenues in Africa and levels of industrialisation. Specifically, a million dollar increase in Chinese construction contracts in a particular country is associated with a reduction in MVA of 0.02 per cent, on average, after accounting for size, energy consumption and trade openness. These results also hold when the construction revenues variable is lagged by a year - while longer lags would have been welcome, paucity of data made it impossible to do so. This is a limitation of the findings. To be sure these results generalise across African states and makes no conclusions as to which way the causality runs. Some possible explanations are elaborated below.

Firstly, the negative relation between China's infrastructure development and industrialisation could also reflect the fact that resource extraction is a major motivation behind construction and that resource rich economies in Africa tend to suffer from the Dutch disease and low industrialisation levels.

It could also lend to the hypothesis that Africa's rapid expansion of externally sourced infrastructure raises the risk of deindustrialisation. Deindustrialisation could take place through a variety of channels. For instance, inviting competitive construction firms from overseas to enter local infrastructure markets can lead to a crowding out of local contractors as well as local manufacturers of industrial commodities such as steel and cement. If heavy industry forms a large part of manufacturing activity in such an economy, it is highly likely that competition from foreign firms will drive down manufacturing. A negative relationship between manufacturing and infrastructure could also be reflective of bottlenecks in other areas pertaining to the ease of doing business. Particularly, institutional hindrances to the establishment of enterprises could result in non entry by potential manufacturers despite a greater infrastructure stock, even as the heavy industry sector reels from increased competition, leading to decreases in industrial production overall.

Additionally, and importantly, productivity is ultimately determined by how well the infrastructure is utilised in an economy (Hulten

1996). Economic agents in charge of operating and utilising infrastructure are responsible for generating productivity out of the facilities. As such, a lack of know-how or training can result in what can be called an effective infrastructure deficit, wherein infrastructure stock increases do not lower business costs. The purpose for which infrastructure is utilised could also determine levels of industrialisation. For example, if most of the gains from physical connectivity accrue to the resource extraction industry, capital will likely flock to those sectors, thus increasing costs of capital for non-resource industrialists and manufacturers. Connectivity infrastructure built with the express purpose of transporting natural resources, therefore, could contribute to deindustrialisation via an exacerbation of the economy's primary dependence. Moreover, externally financed infrastructure development could also stifle activity, if the debt service burden should prompt tax hikes, whether on consumers or producers.

A negative relation with industrialisation could also reflect lack of absorptive capacity in Africa, relative to its demand for infrastructure. As the African Economic Outlook 2018 admits, it would not be pragmatic for Africa to plug its entire infrastructure gap all at once (AfDB 2018). China's imperative to construct for constructions' sake, in a bid to relieve its leveraged construction companies of debt, leads to a low level equilibrium as infrastructure is being supplied to Africa as it is being demanded, irrespective of whether the demand is based on sound fiscal and commercial logic. Not all big pushes are equally desirable from a policy standpoint and, like most solutions, are prone to excesses.

REGIONAL ECONOMIC INTEGRATION

Closely linked to economic growth and industrialisation in Africa is the level of regional

economic integration within the continent. In a conventional sense, greater regional integration allows African enterprises to expand beyond national borders and benefit from economies of scale (United Nations 2009). The gains from operations of scale are particularly discernible in Africa since the continent is fragmented into numerous small, landlocked countries meaning that gains from industry agglomeration have not yet been fully exploited (DFID 2011; Kayizzi-Mugerwa, Anyanwu and Conceicao 2014; Foster and Garmienda 2010). However, the benefits of regional integration are witnessed above the level of the firm as well. Intra-regional trade within Africa has been credited with strengthening resilience to shocks in the global economy, since African countries' regional trade tends to be far more diversified in nature than their trade with non-African countries (Ncube, Brixiova and Meng 2014; Ancharaz, Mbekeani and Brixiova 2011). Conversely, extra regional trade with China in particular has rendered the continent - especially the oil-exporting countries - more susceptible to negative spillovers from China (Drummond and Liu 2013). With commodity prices facing a protracted slowdown, the necessity of such structural safeguards are inexorably heightened. Social benefits follow - according to Anyanwu (2014), a one per cent increase in intra-African trade results in a 1.47 per cent reduction in overall youth unemployment.

To be sure, African governments have made notable strides in promoting regional integration through a slew of Regional Integration Agreements (RIA) and regional tariff reductions. Africa's intra-regional trade grew at a higher rate than trade with the rest of the world in the period 2000-07 (Douillet and

Pauw 2012). Africa also exhibits higher intra-industry trade index than most other parts of the world, although this is likely a function of the continent's low share in world trade (DFID 2011). Nevertheless, it has been acknowledged that more must be done to expand intra-regional trade and integration, and that the results, while encouraging, have not matched the expectations and the magnitude of the efforts (Jordaan 2014; Abuka 2005; Limao and Venables 2001). Africa's intra-regional exports and imports stood at 17 per cent and 13 per cent on average respectively in 2016 (African Union 2017). South Africa's relatively outsized levels of intra-Africa trade, inflate the average, meaning that integration levels are in fact even lower. While the share of intra-exports in total exports has certainly increased, they are still lower than the levels in developing parts of Asia and Latin America (Ancharaz, Mbekeani and Brixiova 2011).

Infrastructure plays an integral role in enhancing regional integration in Africa, for obvious reasons. A lack of it effectively acts as a tariff on intra-African trade by raising costs of transportation and energy consumption (Hailu 2014). Moreover, infrastructure development in a particular country generates positive externalities for neighbours, just as depletion creates negative externalities (Easterly and Levine 1998). This is especially true for landlocked countries. In the case of the countries of the West African Economic and Monetary Union, for instance, it has been predicted that regional trade would increase by a factor of three if all intrastate roads were to be paved (Coulibaly and Fontagne 2005 quoted in UNCTAD 2009). As such, the development of trade-supporting infrastructure, in particular, has been given special significance in Africa's

policy priorities (African Export Import Bank 2018). Indirect effects are postulated as well. In theory, to the extent that infrastructure promotes manufacturing and structural transformation in Africa's constituent economies, it will apply a downward pressure on final consumption goods imports from countries outside Africa (World Bank 2016). Naturally, China's infrastructure engagement has emerged as a vital factor in Africa's articulation and implementation of a strategy for regional integration.

It is being recognised, in Africa, that China's infrastructure development on the continent generates opportunities as well as challenges with respect to regional integration. While African leaders and policymakers have commended China's contributions to plugging the continent's infrastructure gap, it has been noted that bilaterally undertaken projects sometimes amount to a prioritisation of narrow national interests over regional ones (Centre for Chinese Studies 2008; Schiere and Rugamba 2011; Omoruyi et. al. 2016). Bilaterally negotiated projects tend to be preferred partly due to the vast number and overlapping nature of regional groupings on the continent, which effectively increase the transaction costs of implementing jointly developed projects. As such, it is admitted that the extent to which Chinese infrastructure projects support regional integration is incumbent on Africa's success in streamlining its institutional frameworks. Given the inertia witnessed in this regard, a study commissioned by the AfDB in 2011 even recommended circumventing the requirement through joint bargaining by African countries within the FOCAC framework (Schiere and Rugamba 2011). The need for unity among African countries in infrastructure negotiations has been highlighted (Ndzendze

and Hoeymissen 2018; Solomon 2018). The complexity of regional frameworks and vast multitude of national and sub-national actors on the continent, however, have meant that this recourse has remained elusive (van Staden, Alden and Yu-Shan 2018). The AU prioritising collective negotiations in Africa's external engagements at the 28th Summit in 2017, gave an impetus to regionally integrative infrastructure development (van Staden, Alden and Yu-Shan 2018).

From the Chinese side, there are unlikely to be major hesitations in undertaking jointly developed infrastructure projects. China's leveraged construction companies fervently covet the development of grand mega-projects and are known to lament the level of fragmentation in Africa that preclude this (Financial Times 2018). The AU Commission was made a full member of the FOCAC in 2012, and three years later China set up a diplomatic mission to the AU in Addis Ababa (van Staden, Alden and Wu). China's endorsement of the African Union's Agenda 2063, which aims to bring intra-African trade to 50 per cent of the continent's total trade by that year (AU 2015), is ostensibly motivated by its economic imperative to construct for constructions' sake. China's commitment to bolstering African regional integration is stated clearly in the FOCAC Action Plan 2019-21, with its emphasis on "continental, regional and sub-regional connectivity" (MOFA 2018).

As in the previous model, cross-country panel regressions were conducted, this time on 38 African countries for the period 2003 to 2016, due to data constraints. A total of 494 country-year observations were thus obtained. Regional economic integration has been

defined as the ratio of a country's intra-African trade to its total trade in a particular year. China's infrastructure development is defined as construction contracts as in the previous model and a different set of control variables are included (see Appendix). The Hausman test indicates that the results of the fixed effects model are relevant to this model.

The results indicate a statistically significant negative relationship between China's infrastructure contracts in an African country and its levels of regional trade integration. The extent of the reduction, however, is fairly modest. A million dollar increase in construction contracts are associated with a regional trade reduction of 0.008 per cent after controls. Using a one year lag, however, eliminates the negative relation and renders it insignificant, meaning that the negative association erodes over time.

The most ready explanation for this observation is that China's infrastructure development in African countries has, on average, spurred extra-regional trade at a rate faster than that of intra-regional trade, at least in the short-run. Africa's expanding trade with China in the years since 2000 has been associated with a reduction in intra-African trade in a number of empirical studies (Giovanetti and Sanfilippo 2009; Khosla 2015). Infrastructure in particular, has played a role in this trade diversion. Khosla (2015), for instance, obtains results which suggest that while China's infrastructure projects in Africa have had a salutary effect on intra-regional trade in absolute terms, the increments in China-Africa trade have been larger. Indeed, from 2001 to 2017, China's exports to Africa grew at a compound annual growth rate of 17.48 per cent while intra-African

exports grew at 10.05 per cent. Moreover, the negative relation has been found to hold especially true for oil-exporting African countries (Montinari and Prodi 2011). That China's infrastructure development in Africa was configured to serve individual bilateral relationships is hardly surprising, given that for the years between 2003-16 its priorities circled around demand for natural resources on the one hand and exports of cheap manufactures

to African markets on the other (Sy and Copley 2017). The nature of China's finance to Africa may also be partially responsible for the negative relationship observed. A third of China's loans to Africa are said to have been tied to commodities whether it be in the form of African resource exports to China or imports of goods and services from China (Dollar 2016). Such financing would invariably promote extra-regional trade over intra-African trade.

Table 2.3 - Model of China's Infrastructure Development in Africa and Regional Economic Integration

Variable		Pooled	Fixed Effects	Random Effects
Chinese Construction Contracts	B p	-0.0017984 0.010	-0.0008956 0.012	-0.00559 0.073
Gross Domestic Product Growth		0.284185 0.755	0.2181971 0.574	-0.2587922 0.506
Trade Openness		0.3576632 0.000	0.016355 0.469	0.0322158 0.173
Coastal State		-22.00816 0.000		-21.28117 0.000
Gross Domestic Product (current USD)		7.07e-12 0.476	1.55e-11 0.046	
Democracy		0.1370213 0.001	-0.1563948 0.000	-0.1239007 0.000
Market Efficiency		3.206375 0.208		
GDP Per Capita		-0.0023252 0.000		
GDP Per Capita Growth		-0.4413878 0.637	0.2041786 0.608	0.2351839 0.555
Constant		6.310677 0.556	32.357 0.000	45.03113 0.000
R-squared		0.5429	0.0171	0.2412
N		286	494	494

Note. Results computed using Stata 13.0.

These findings also concur with the concerns that have been expressed in African and Chinese policymaking circles regarding the fragmented nature of infrastructure planning on the continent. In addition to the fragmentation on the African side, China's infrastructure development on the continent is being undertaken by a multitude of distinct actors including the China Development Bank, China Exim Bank, MOFCOM as well as a host of large construction companies (AfDB 2011). Many of

these actors compete amongst themselves for projects, often in a haphazard fashion, meaning that China's construction activity in Africa is not coordinated seamlessly from Beijing (World Economic Forum 2018). Visible impetus to coordination within the Chinese foreign aid process began in 2018, with the establishment of the China International Development Cooperation Agency (CIDCA), a body answerable to the State Council which is meant to consolidate fragmented processes.

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APPENDIX

Table 2A.1- Definitions of Variables Used in Statistical Models

Variable	Operational Definition	Unit	Source
Chinese Construction Contracts	Revenues of Chinese construction companies in African countries	USD million	China Africa Research Initiative, School of Advanced International Studies, Johns Hopkins University
Industrialisation	Manufacturing Value Added as a per cent of GDP	%	World Bank
Regional Integration	Intra-African trade as a per cent of a country's total trade	%	International Trade Centre, Geneva
GDP	Real Gross Domestic Product at current value	USD	World Bank
GDP Growth	Real rate of change in GDP	%	World Bank
Energy Intensity	Ratio between energy supply and GDP measured at purchasing power parity	%	World Bank
Trade Openness	Total Trade as a per cent of real GDP	%	International Trade Centre, Geneva; World Bank
GDP Per Capita	Real GDP divided by population size	USD	World Bank
Coastal State	Nation-state that is not landlocked	N/A	
Democracy Level	Freedom House Democracy Scores, composite index of 10 political rights and 15 civil liberties indicators	N/A (0-100 range)	Freedom House
Market Efficiency	Global Competitiveness Report Scores	N/A (1-7 range)	World Economic Forum

Table 2A.2 Summary Statistics for Industrialisation Model

	Mean	Median	Standard Deviation	Minimum	Maximum	Observations
Chinese Construction Revenue (in USD million)	504.15	127.73	1020.45	0.00	8434.21	630
Industrialisation (in %)	26.42	22.50	16.20	2.07	87.80	644
Energy (in %)	7.49	5.92	5.55	1.91	33.05	644
Openness (in %)	76.57	69.90	35.19	19.10	311.36	631
GDP (in USD million)	35333.87	10045.10	75518.53	317.56	568498.94	644
Per capita GDP (in USD)	2133.26	839.11	3132.58	112.85	22742.38	639
GDP (logged value)	23.05	23.03	1.56	19.58	27.07	644

Table 2A.3: Summary Statistics for Regional Integration Model

	Mean	Median	Standard Deviation	Minimum	Maximum	Observations
Chinese Construction Revenues (in USD million)	519.45	129.81	1075.22	0.45	8434.21	532.00
Regional Integration within Africa (in %)	24.86	21.77	18.43	1.59	93.47	494.00
GDP Growth Rate (in %)	4.55	4.64	4.19	-36.70	33.74	532.00
Openness Index (Trade to GDP ratio in %)	59.08	53.34	26.29	17.44	156.83	532.00
GDP (in USD million)	38496.03	9966.48	81993.23	317.56	568498.94	532.00
Democracy Level (Index Value, 0-100)	51.44	49.00	21.18	6.00	91.00	532.00
Market Efficiency (Index Value, 1-7)	3.98	3.97	0.37	2.98	4.92	299.00
GDP Per Capita (in USD)	2153.97	933.57	2728.01	112.85	15060.99	532.00
GDP Per Capita Growth Rate (in%)	2.14	2.17	4.03	-36.83	30.36	532.00

Table 2A.4: Major Chinese Construction Projects in East Africa

Project	Country	Sector	Amount (USD)	Company
Addis Ababa Light Rail Transit (AA-LRT)	Ethiopia	Transport and Storage	475 million	China Railway Engineering Corporation Limited
Addis Ababa-Djibouti Railway	Ethiopia, Djibouti	Transport and Storage	3400 million	China Civil Engineering Construction Corporation Ltd, or CCECC, and China Railway Group Limited
AU Headquarters	Ethiopia	Government	200 million	China State Construction Engineering Corporation
Bagamoyo Port	Tanzania	Transport and Storage	2000 million	China Merchant Holding (International) Company
CNBM Zambia Cement Plant	Zambia	Real Estate	500 million (estimated)	China National Building Material
Dar es Salaam Maritime Gateway Project	Tanzania	Transport and Storage	421 million	China Harbour Engineering Company
Garissa Power Plant	Kenya	Power Generation and Supply	135 million	China Jiangxi
Kampala-Entebbe Road	Uganda	Transport and Storage	350 million	China Communications Construction Company (CCCC)
Kigamboni Bridge	Tanzania	Transport and Storage	135 million	China Railway Construction Engineering Group (CRCEG) and China Railway Major Bridge Group (CRMBG)
Konza Tech City	Kenya	Real Estate	666 million	Huawei, China Road and Bridge Corporation
Mtwara Gas Pipeline	Tanzania	Power Generation and Supply	1297 million	China Petroleum Technology & Development Corporation (CPTDC) and the China Petroleum Pipeline Engineering Corporation (CPPEC)

National ICT Backbone	Tanzania	Communications	263.7 million (to date)	China International Telecommunication Construction Corporation
Standard Gauge Railway	Kenya	Transport and Storage	3800 million	China Road and Bridge Corporation
Zanzibar Airport	Tanzania	Transport and Storage	73.85 million (to date)	Beijing Construction Engineering Group
Zimbabwe Parliament	Zimbabwe	Government	100 million	Shanghai Construction Group

Sources: Xinhua (2017); CGTN (2019); Reuters (2018); Ge (2019); World Bank (2019); China Daily (2017); Reuters (2018); Xinhua (2018); Reuters (2019); Aiddata (2017); Kenya Railways (n.d.); China Daily (2017).

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BUILDING AND DEVELOPING PORT INFRASTRUCTURE

Veda Vaidyanathan and Jumanne Gomera

DAR ES SALAAM PORT: CHINESE CONTRACTOR WORKING WITH FOREIGN FUNDING

The foundation of Dar es Salaam, the archetypal port city took place in the late 18th century and is attributed to the erstwhile Arab rulers of Zanzibar as increasing ship sizes created a requirement for port draft deeper than was available at Bagamoyo (Hoyle 1978). The German, and later the British, colonialists went on to cement the position of Dar as one of East Africa's most prominent ports. In less than two decades after Tanzania achieved independence in 1961, throughput at Dar quadrupled (Honke and Cuesta-Fernandez 2018).



Photo: Leaving Dar es Salaam en route to Zanzibar, October 2018

Along with the port at Mombasa in Kenya, Dar es Salaam port is one of the few major ports on the Eastern African seaboard. This translates into a dependence on the port for trade, not only for Tanzania, but also its landlocked neighbors including Zambia, Burundi and Uganda. Indeed, the surge in traffic experienced in

the 1960s was, in large part, facilitated by the transit of Zambian resources such as copper, which resulted in the construction of new berths at Dar es Salaam financed by the Zambian government and the International Bank for Reconstruction and Development (IBRD) (Hoyle 1978). While 90 per cent of Tanzania's foreign trade takes place from this node (Tanzania Port Authority 2009), 30 per cent of the port's traffic corresponds to the foreign trade of Zambia, Malawi, the Democratic Republic of Congo (DRC), Burundi and Rwanda (Honke and Cuesta-Fernandez 2018).

Economic growth and opening up in East Africa over the decades has placed further pressure on the port. Total cargo traffic grew at breakneck rates of 5.56 and 8.97 per cent during the periods 2007-09 and 2009-16 respectively (World Bank 2016). Container traffic grew at an even faster 12-13 per cent during the period, with Tanzania's share reducing relative to its landlocked neighbours (World Bank 2016).

With East Africa incrementally integrating itself into the global trading economy, burdening the port beyond its wherewithal, the antiquated port at Dar es Salaam became beset with operational inefficiencies. According to the World Bank appraisal of the port, the waiting time for a berth for dry bulk vessels reached an average of 4.5 days in 2013, while in 2014, transit containers recorded an average dwell time of 10.2 days and domestic containers

recorded an average dwell time in port of 7.7 days, compared to, for example, 4 days in the port of Durban in South Africa (World Bank 2017). According to the World Bank's 2013 Tanzania Economic Update, "trade costs are 60 per cent higher between Tanzania and China than between Brazil and China where the distance involved is almost two-fold." With its efficiency deteriorated, Dar es Salaam lost its position as East Africa's most efficient port to Mombasa. The same study calculates that, were the Dar es Salaam port to achieve the operational efficiency level of Mombasa, Tanzania would gain USD 1.8 billion per year, whereas the rest of East Africa would gain USD 0.8 billion per year (World Bank 2013).

With East Africa incrementally integrating itself into the global trading economy, burdening the port beyond its wherewithal, the antiquated port at Dar es Salaam became beset with operational inefficiencies.

The reason behind the inefficiency of the port is primarily its antiquity. According to the International Development Association, "Dar es Salaam port is considered to be a first generation port, merely acting as an interface location between land and sea transport for cargo." Such an arrangement served colonial extractors; in today's global economy, competitiveness derives more from efficiency. Mwendapole finds that the port's inefficiencies are also caused by poor hinterland rail and road connectivity, lack of ICT-based management, inadequate human resource quality and incompatibility with large ships (Panamax) (Mwendapole 2015). According to Hoyle, "from a navigational standpoint Dar es Salaam is in some respects the most difficult of the East African ports, for in spite of its deepwater

facilities the harbor is relatively small and the entrance constricted. Furthermore, vested interests have been responsible for delaying solutions with respect to the port's efficiency". Port inefficiency, insofar as it is effectively a 22 per cent, unofficial tariff on imports, protects domestic producers and generates rent seeking opportunities for corrupt officials (World Bank 2013). One study states, "investment in the direct port requirements within the existing port footprint will require more than USD 1 billion which is beyond the current capacity of Tanzania Port Authority (TPA) to provide" (Hoyle 1978).

In 2009, the TPA which owns Dar es Salaam port and operates part of it (berths 1-7, while 8-11 has been operated by Tanzania International Container Terminal Services since 2000), released the Tanzania National Ports Master Plan, which analysed the scope of the problems facing Tanzania's ports and devising an effective and feasible solution. The Master Plan also highlighted the imperative to develop the port into a multimodal corridor by improving rail and road transport (Tanzania Ports Authority 2009). As per the Tanzania Ports Handbook 2016-17, 99 per cent of the cargo of Dar es Salaam port leaves by road, resulting in congestion, and a reliance on truck turn around times. Enhancing the capacity of Tanzania's two principal railway lines, the TAZARA and Tanzania Railway Line (TRL) has been afforded priority in both the documents. Most importantly, however, the Master Plan called for the expansion of the port at Dar es Salaam which was to serve as a placeholder until a larger port is built at Bagamoyo. The objective is recasting the port of Dar es Salaam from port-as-checkpoint to gateway (Tanzania Ports Authority 2017).

The Dar es Salaam Maritime Gateway Project (DMGP) was conceptualised on the findings of the World Bank's Tanzania Economic Update 2013 and the National Port Master Plan 2009. The initiative had been launched under the banner of President Kikwete's Big Results Now initiative, which aims for Tanzania to become a middle income country by 2025, and is aligned with the Tanzania Development Vision 2025. In 2014, the TPA signed an MoU with the World Bank, TradeMark East Africa (TMEA) and the UK's Department for International Development (DFID), to "expand and modernise" the Dar es Salaam port in what the Tanzania Port Handbook declares to be a USD 565 million project. The Dar es Salaam Maritime Gateway Project avowedly aims to establish the port as the world's gateway to East Africa and includes the deepening and strengthening of berths 1-7, the construction of a new ro-ro berth, further dredging of the entrance channel and capacity building of human resources to boost operational efficiency.

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The International Development Association (IDA) project appraisal calculates the total cost of the project at USD 421 million, out of which it will fund to the tune of 345 million, with the remainder being furnished by TMEA and DFID. Out of the total funds, USD 400 million is towards the improvement of the port's physical infrastructure, while the remaining USD 20 million will go toward institutional and human

resource development. Under this second component, the TPA will receive training to improve its capability to operate berths 1-7 (acclimatisation to information systems, management), as well as institutional training to encourage private sector participation in the future. As such, the skill training and technology transfer aspect of the Dar es Salaam port expansion is being taken care of by the financiers of the project. According to the financial agreement between TPA and the Bank, the interest charged on the credit will be 4.5 per cent and is to be paid over a period of 30 years ending in 2047 (World Bank 2017). The lending terms, therefore, are not particularly concessional. A German company, INROS Lackner, has been awarded a contract to provide consultancy although a TPA interviewee refers to Sellhorn as consultant; according to WB procurement documents however, Sellhorn is a rejected bidder and INROS is the winner.

The IDA's project appraisal document states that "the qualification criteria will be set to allow only for the selection of reputable contracting firms with proven experience in similar works and sound financial footing to undertake these works." Securing the USD 145 million contract for the refurbishment of berths 1-7 and the ro-ro terminal is, therefore, a boost to the credentials of the China Harbour Engineering Company (CHEC). CHEC competed with three Chinese, one Greek, one South African, one Portuguese and one Dutch company. The importance of winning a World Bank financed contract is heightened by the fact that China Communications Construction Company, of which CHEC is a subsidiary, was blacklisted by the Bank in 2009 on charges of collusion, only to be disbarred in 2017.

The CHEC has come against charges of corruption in a number of projects in countries such as Bangladesh, Zimbabwe, Uganda, Sri Lanka etc. The company was disqualified from undertaking construction in Mumbai, India, due to its links to the CPEC. CHEC has also signed a USD 350 million contract for the construction of a liquefied natural gas (LNG) terminal in Ghana as well as a contract for the construction of a railway line connecting Kampala, Uganda, Malaba, Kenya, and Nimule in South Sudan (Construction Review 2015). Other projects across Africa include the Lobito Port Project (Angola), Port Abidjan Project (Ivory Coast), Beira Port (Mozambique), Walvis Bay Port (Namibia) and Kraba Port Project (Cameroon) (Xinhua 2017). CHEC was also the contractor for the controversial Hambantota port in Sri Lanka and is involved in construction in Colombo. The company has bagged contracts worth USD 9.5 billion in over 70 countries worldwide. This company appears to be the Chinese governments go-to company when it comes to BRI related projects.

Strict environmental and social safeguards are known to be tied to World Bank finance. In the DMGP, the TPA is to prepare a progress report for the Bank which will include a summary of the status of the Environmental and Social Management Plans (ESMPs). A comprehensive Environmental and Social Impact Assessment (ESIA) was carried out by Indian state run consultancy WAPCOS Ltd (World Bank 2015). Contractors such as CHEC will incur certain costs in adhering to these standards. The IDA project appraisal states that, as part of their Environmental, Health and Safety Management Plan (EHSMP), contractors/ construction companies will establish an HIV/AIDS/STD management plan that includes education and sensitisation on HIV/AIDS/STD, zero-tolerance

on sexual harassment, exploitation of minors, etc., which will be implemented in collaboration with the relevant existing district systems and structures (World Bank 2017).

Another goal is to ensure that “all improvements are climate-smart and consistent with the aspiration to become a ‘green port,’ with the TPA endeavouring to secure an ISO 14001 Certificate for the Dar es Salaam Port. As such, it is unlikely that the CHEC is in a position to opt for the cheapest solutions on the table when it comes to construction. In fact, according to a CHEC executive, it does not even expect that its involvement in the project will be profitable overall. The company’s professed aim is to salvage its reputation and make entry into the market for multilateral finance. Navigating the Bank’s conditionalities is a short term cost the company will have to pay for long term benefit. This experience is bound to diverge from construction under Chinese financiers such as China Exim.

Out of the contractors participating in World Bank funded projects, 30 per cent are Chinese (Hillman 2017). It is undeniable that Chinese infrastructure companies are remarkably competitive. The same percentage for Chinese funded projects, however, is 89 per cent (Hillman 2017). This is disproportionate to competitiveness and results from the ‘tied’ nature of Chinese lending. The World Bank is much more zealous in ensuring that all contract bidders are at a level playing field.

With respect to environmental safeguards, the China Exim Bank’s White Paper on Green Finance 2016, does mirror standards of the World Bank. However, in practice, the adherence to such safeguards is suspect in the case of Chinese funded projects. Chen

and Landry (2016) compare two Chinese contractors working on hydropower projects in Cameroon, where one is World Bank funded and the other is financed by China Exim. They find that although China Exim has put in place environmental and social safeguards, these fall far short of those adhered to by the World Bank. Moreover, the World Bank is far more adamant in enforcing these standards as opposed to the Chinese and will freeze disbursements until standards are met (Chen and Landry 2016). Information disclosure is also taken very seriously by the World Bank at every stage of a project; China Exim, for example, does not adhere to strict disclosure. According to one report, Chinese investment are “not accompanied by grievance and enforcement mechanisms, which makes it difficult for affected communities to hold the investors accountable” (Inclusive Development International 2017). Conceptual frameworks exist in the form of guidelines which broadly address safeguards. These include the clumsily titled ‘Guidelines for Environmental Protection in Foreign Investment and Cooperation (2013)’ and ‘Guide on Social Responsibility for Chinese International Contractors (2012).’ Enforcement mechanisms, on the other hand are scant as are grievance mechanisms.

CHEC is treading uncharted waters with the DMGP. It is likely enjoying implicit state guarantees against defaulting on loans back at home and is, therefore, in a position to sacrifice financial fundamentals in the short term for revenue in the long run. However, if the companies fundamentals weaken in the future, this should serve to imperil its ability to qualify for World Bank bids. It is also likely that the sheer scale of CHEC’s operations render it resilient to losses in any particular project.

The TPA is also set to undergo reforms on account of engagement with the World Bank. This is bound to have ruffled the feathers of some at the TPA. As per the DMGP, the TPA is to be transformed into a landlord authority, while port operations are to be incrementally handed over to private sector actors. While Chinese contractors may be tied to Chinese finance, privatisation and liberalisation requirements do not feature. This results in a competitive relation between Western and Chinese financiers. One study finds that African borrowers “receive 15 per cent fewer conditions (for World Bank finance) for every percentage-point increase in Chinese aid.” (Hernandez 2017). China’s broadening of environmental and social standards could also be viewed as a necessary response to competition.

The refurbishment and expansion of the Dar es Salaam Port, a Design & Build (D&B) project costing USD 154 million, funded by the World Bank and undertaken by the CHEC was announced on the 10th of June 2017, construction began on the 30th of June 2017 and is expected to be completed on the 20th of June 2020. It includes 7 berths, the first four of which are normal berths and the last three of which are container berths. Thus far, it employs 500 people consisting of 350 jobs for locals and 150 Chinese. Currently, the foundation of the first berth has been laid, while two thirds of the superstructures of berths 4-7 have also been completed.

While the general contractor is China Harbour, the biggest subcontractor is the 4th HEC (based in Guangzhou), both subsidiaries of CCCC. Company executives admitted that the challenge of building a 13700m berth was daunting: “Everyone said at the beginning that

because the berths are so large, we will not be able to complete on time. But we are putting in additional resources, and working overtime to make sure that it is done within the agreed time.” In terms of the technology, CHEC is utilising techniques including Pre Coastal High Stress (PhC) and Pre tension High Stress Concrete Pile on water- methods that have never been used in Africa before.

Regarding the sustainability of the project, CHEC maintains that the TPA has the capacity to Operate and maintain the port after its completion. However, the expansion of berth five (5) to seven (7) will install new features requiring capacity building for local technicians to run and maintain it. However, such training is, surprisingly, not part of part of the project contract. Only basic on-the-job training was provided. Therefore, skill transfer to the local workers was not systematically addressed. Moreover, engineers at the TPA said that since all the design work is carried out in China, locals have had to familiarise themselves to the new equipment through self learning. This has involved poring over project documents, methodology statements, drawings submitted and on site observation. Locals admitted that there were serious cultural and language barriers as well. “Many Chinese experts from China only speak Chinese. Only few speak English, which cause communication problems. All the documents are in Chinese too”, a Tanzanian engineer at the site, who did not wish to be identified said. Due to a lack of technical skills in Tanzania, the TPA had enlisted the services of SailHorn, a German consultancy, to complete the site supervision. “With regard to supplies, a few things like cement, sand, stones, fuel were procured locally but almost all other raw materials - including mosquito nets and masks- were procured from China”.

One of the major challenges facing the Dar port expansion project is that the berths need to be built while the port operates at full capacity which complicates construction operations. Berths need to be released one at a time, the handover process is complex and because the construction vessels and containers use the same space, the crowding is exacerbated. This makes achieving the 36 month deadline an uphill task. However, the Chinese managers seemed prepared to pour in additional time and resources - “We won the bid, so we will complete it”, is what a Chinese supervisor at the project site said.

The case study of Dar es Salaam is critical because CHEC executives were in a position to compare the experience of working on a World Bank sponsored project as well as a China Exim project. Some of the major differences included:

Standards: The World Bank projects required working on American or British standards, which meant alterations in the mode of operations. Western standards are more detailed than those CHEC is accustomed to. Managers admitted that it was “more difficult to work on foreign standards.” Employing new standards also increases costs as there is a need to hire technical staff, in this case the British consultancy, Roughton. Additionally, there is also a strong emphasis on adherence to environmental, health safety & quality standards, which involves more checking and inspections.

Increasing cost overheads: The World Bank had several requirements including hiring more technical staff, more site inspections and there was an emphasis on cleanliness of the project sites.

Creating better work environments: It was pointed out that communication with the staff had to be civil and professional. Salaries - higher than local labour market price- had to be paid on time and workers insured. The provision of a host of social services was also mandated - contraceptives had to be distributed freely to workers and awareness training on HIV/AIDS provided by the labour occupation and health department. Moreover, changing rooms, restrooms and canteens had to be built along with a centre for skills transfer.

Despite the increased cost burden, however, the Chinese managers conceded that stricter requirements from the World Bank improved the quality of construction as compared to projects completed with funding from China Exim. The project is estimated to be done up to 50 per cent as of August 2019, whereby construction of berth one to three is completed, while the remaining berth number four to seven still under construction and expected to be completed by June 2020 (Telephonic Interview with Site Engineer 2019).

BAGAMOYO PORT: CHALLENGES IN STRIKING THE DEAL

The port city of Bagamoyo was arguably the most prominent trade hub in East Africa in the 18th and 19th centuries, prior to the entrenchment of the German colonialists who, thereafter, developed Dar es Salaam as the region's main major port and power centre. In the 1830s, the Sultan of Oman moved his administration from Muscat to the island of Zanzibar in a bid to take control of East African trade consisting of transactions in slaves and minerals. The port at Bagamoyo was the source of 60.9 per cent of Zanzibar's ivory trade, and 96.1 per cent of its copal trade (Brown 1971). Bagamoyo,

at that time, was already a thriving hub and harboured a robust indigenous ecosystem of suppliers and merchants. By 1870, it had the largest number of Asian merchants living along the central stretch of the East African coastline. As a result, the Sultanate struggled and ultimately failed to secure control of the East African supply chain.

It was at this juncture that the development of Dar es Salaam as a rival port city was first attempted. Not home to a major port at the time, the objective was to disrupt supply chains by competing with Bagamoyo and create an opening for the establishment of control over trading activities. The Omani attempt failed however, and Bagamoyo continued to occupy pride of place in East Africa. Another futile attempt at crippling Bagamoyo and taking control of East African trade was made by the British in the late 19th century. It was the construction of railways in East Africa by the Germans in the early 20th century that ultimately succeeding in disrupting the incentive structures for traders, which lead to Bagamoyo's fall from grace. Bagamoyo has been eclipsed by the port of Dar es Salaam, which now handles over 90 per cent of all of Tanzania's foreign trade, and has been relegated to a small fishing village, albeit with a rich historical heritage.

However, Bagamoyo's fortunes may be changing once again. The province was earmarked to be developed as a Special Economic Zone in a programme declared by the Government of Tanzania (GoT) in 2006. A Bagamoyo SEZ Master Plan was prepared in 2013, which envisioned constructing infrastructure throughout the province, although specific details of exclusive large scale projects were not included in the document. During his

2008 visit to China, President Kikwete urged President Hu Jintao to invest in the Bagamoyo SEZ (Embassy of PRC in Tanzania 2015).

Meanwhile, with East Africa increasing trade engagement with the rest of the world, the port at Dar es Salaam is increasingly beset with operational inefficiencies. According to a 2013 Price Waterhouse Cooper report, “the cost of using the port is 24 per cent higher than other port facilities in sub-Saharan Africa” (PWC 2013). While the World Bank is financing a project to refurbish the port at Dar es Salaam, the extent to which it can accommodate the expected growth in trade is limited. Its colonial era infrastructure lacks the wherewithal to sustain trade in a modern global economy. Moreover, the development of a sprawling urban settlement around the port has limited the space available for port expansion.

Taking these factors into account, the Tanzania National Ports Master Plan released in 2009 acknowledged the need to develop a greenfield port, unencumbered by a heritage of outdated infrastructure and woes of land availability. The Plan stated that the proposed expansion of Dar es Salaam port would, at best, suffice until the year 2020, whereafter a new area would have to be developed. A greenfield port at Bagamoyo was preliminarily identified as the most profitable method of handling the spillage of Dar es Salaam port. In addition to the natural and topographic advantages, Bagamoyo also had a historical significance as it followed the central corridor, a natural course during the slave trade, it connected to the great lakes region, DRC, Zambia and Walrus bay. Notably, the Master Plan estimated the total cost of building the greenfield Bagamoyo port at USD 680 million.

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In the years after the 2009 Port Master Plan, however, Tanzania's ambitions with respect to the Bagamoyo port increased significantly. Tanzania's commitment to construct a fourth generation port at the location was likely also fuelled by the fact that Bagamoyo was the hometown of then President Kikwete. In 2013, with President Xi Jinping picking Tanzania as his first stop in his first overseas visit as head of state, the Bagamoyo port project inched a step closer to materialisation. It was during this visit that President Xi proposed the four principles of “sincerity, real results, affinity and good faith,” (Xinhua 2018) and signed an agreement for the construction of a USD 10 billion megaport at Bagamoyo (Reuters 2013). Notably, this far exceeded the cost envisioned by the Tanzania Port Master Plan and signified an uptick in the ambition surrounding the project.

The new megaport is to possess a capacity of 20 million TEUs, much larger than the 800,000 TEU capacity of the port at Dar es Salaam. It would also dwarf the port at Mombasa, Kenya. Moreover, the upgraded project is also slated to involve the extensive construction of infrastructure to support the port. The infrastructure around Bagamoyo will connect the project area to the national road network, with the first road from Tageta to Bagamoyo, as also roads from Bagamoyo to Portside in the

Imbegazni region, and Bagamoyo to Mlandezi in the Morogoro area. Preliminary studies have been conducted to connect the region to the TAZARA and the SGR, to ensure the smooth movement of cargo. Proposals to develop a power plant and connect it to the national grid, connecting natural gas from Tageta to Bagamoyo and developing the Kidunda water project as a major water supplier will ensure uninterrupted water and electricity to the project site. Linking the Bagamoyo project area to the National ICT Backbone (NICTBB) will ensure connectivity and communication.

Tanzania contracted Hamburg Port Consulting (HPC) to conduct a feasibility study which was completed in 2010. An MoU was signed with China Merchants Holding International (CMHI) in 2012. The following year, when President Xi visited Tanzania and signed the “strategic partnership framework,” implementation began. In 2014, a tripartite agreement was signed between the GoT, CMHI, and Oman’s State Government Reserve Fund (SGRF) with CMHI holding 80 per cent and SGRF possessing 20 per cent of the ownership. It is an engineering, procurement and construction contract (EPC) on the Built Operate and Transfer model. The government will possess ownership of land, while ownership of the port structure will revert back to it only after investors have recovered their investments. Until such a time, the government of Tanzania will get a land concession fee as well as royalty for business from the investors.

In addition to Bagamoyo, CMHI owns a 23 per cent stake in a port at Djibouti and was also reportedly eyeing ownership stake in the Ethiopian Logistics & Shipping Enterprise (ESLSE) (Daily FT 2013). The parent company of CMHI, China Merchants Group, was behind

the development of a port at Shenzhen which paved the way for its transformation into a high income area. Replicating Shenzhen’s success in Africa is the proclaimed objective of CMHI (China Daily 2017). In 2012, CMHI purchased a 50 per cent stake in a port at Togo in West Africa and later, in 2014, it purchased a stake in the Tin-can container terminal at Lagos, Nigeria (Daily FT 2012). Outside Africa, CMHI has been involved in the purchases of the ports of Kumport in Turkey and Colombo in Sri Lanka. It also owns a large stake in the French company Terminal Link which owns ports in Ivory Coast, Nigeria and Morocco in addition to ports in France, Belgium, South Korea and China (CMA CGM). As such, CMHI is a prominent player in China’s ‘Going Out’ strategy. The Bagamoyo project, too, is emblematic of this. It was espoused as a prominent addition to China’s flagship Belt and Road Initiative (BRI).

As such, CMHI is a prominent player in China’s ‘Going Out’ strategy. The Bagamoyo project, too, is emblematic of this. It was espoused as a prominent addition to China’s flagship Belt and Road Initiative (BRI).

The Bagamoyo project is to consist of an SEZ, industrial park and port. These will occupy 9800, 2200 and 887 hectares respectively. The business model is cargo focused and is expected to generate sizeable revenues in 7-8 years as business in the Indian Ocean expands. The agreement stipulated that in the event of unexpected growth, there will be a review of terms. However, if the project underperforms and there is significant variation between actual business and the projected numbers, the shareholders will collectively share the losses. On the contrary, if the payback is faster

(2-3 years), it will enable the developer to invest in the next phase. As the land had already been earmarked and an MoU signed, the message to CMHI was “lease it or lose it”.

Despite the fanfare in Tanzania's political circles, however, certain concerns were expressed regarding the USD 10 billion incarnation of the Bagamoyo port project. According to one report, greenfield construction at Bagamoyo was redundant due to its proximity to Dar es Salaam and its distance from Tanzania's natural gas reserves. Others contend that there is plenty of room for expansion of the port at Dar es Salaam and that a megaport at Bagamoyo is wasteful and redundant, especially since it would require continuous dredging (Honke and Cuesta-Fernandez 2018). The disutility of unilaterally undercutting other ports in Africa was also pointed out as a pitfall of constructing a port of such a large capacity (Nabee and Walters 2018). Furthermore, it has been pointed out that at Tanzania's current rate of economic growth, it is not going to attract the large container vessels for which the Bagamoyo port is being built (Freight Logistics 2018). It has also been alleged that the project's approval had more to do with the political aspirations of President Kikwete, being located in his hometown, than sound economic calculations (Honan 2015).

Moreover, the foundation stone for the Bagamoyo port was laid in 2015 by then President Kikwete, only two months prior to the transition of power to the current incumbent, John Magufuli. Thereafter, the rectitude of constructing a megaport at Bagamoyo was brought into question as President Magufuli introduced austerity measures and Tanzanian opposition members went up in arms over

Parliament being sidetracked. The primary cause however was that the new administration deemed it prudent to focus on the construction of other ports such as Dar es Salaam and Mtwara, since the Bagamoyo port involved huge costs and demanded more attention. This led to the alleged suspension of construction in early 2016. Construction was reportedly intended to resume once again in July 2016, after a tranche of negotiations, roughly a year behind schedule. These negotiations, however, overshot this time frame. Tanzanian authorities ran into trouble once again, this time in providing compensation to local population who were expected to be affected by the construction. Under the MoU signed in 2014, the TPA was to retain a share of port ownership (along with the investors CMHI and SGRF) provided that it bore the expense of rehabilitating and compensating local residents in Bagamoyo. Out of the USD 28 million that were to be utilised towards compensation, Tanzania managed to raise just 1.5 million, and was compelled to approach CMHI to cover the charge (Kang'ereha 2018). The negotiations resulted in Tanzania losing ownership rights to Bagamoyo port (Tairo 2018). China will reportedly run Bagamoyo as one of its overseas ports, with Tanzania enjoying taxes from the land and fees from the investors. As such, the construction of the project falls under the Build-Own-Operate-Transfer (BOOT) model, with the CMHI having leased the port; the company will operate the port until it recovers its investment and earns a stipulated profit and therefore does not qualify as debt for the Tanzanian government.

Interviews with local government stakeholders corroborated the prevalence of challenges. One of the officials involved with the negotiations, speaking on condition of anonymity identified, said that there were several challenging aspects of striking the deal with CMHI:

Lack of transparency: “They say one thing to us and mean something else. Total change of (the) goalpost,” the local official lamented. “Particulars that have been agreed to after lots of deliberations completely change by the next meeting, so now after every meeting, we write down the outcomes and have it signed by everyone in the room.”

Gap in Understanding: Tanzanian officials suggested that there were significant misunderstandings stemming from cultural and linguistic dissimilarities.

Terms: “The Chinese have asked for additional incentives over and above the existing ones - some have been agreed to, but not all,” the official explained. For example, the concessional period was set according to international benchmarks. Considering that green field projects usually take 30-35 years, Tanzania agreed to a 33 year lease for Phase 1. However, CMHI also pushed for the second and third phases to include a 35 year lease, something that the Tanzanian negotiators found unfair. “This is the first port that we are building since independence, our exposure to the dynamics of the port business has been limited. It will take us 33 years to learn and

meanwhile the business of phase 1 will inform us”. Thus, the government wanted to review the 33 years or period of full repayment, while CM perceived this as a critical uncertainty and an unnecessary risk, thereby delaying negotiations.

Legal framework: Considering the quantum and time line of investments, and the ‘perceived inefficiency of the laws of Tanzania’, CM prompted the GoT to pass a few legal protective measures specifically for the Bagamoyo project, a request that was denied by the government as “passing laws/acts are time consuming and would set a dangerous precedent.”

The Bagamoyo project is still under negotiation has not commenced. Only preliminary studies have been conducted. Technical and geospatial studies will be conducted after the agreement is signed. Since interviewing Tanzanian officials in Dar es Salaam regarding this project, news has emerged that negotiations have reached an impasse. According to the director of the Tanzania Port Authority “The conditions that they have given us are commercially unviable. We said no, let’s meet halfway. It would have been a loss...they should not treat us like schoolkids and act like our teachers” (Reuters 2019).

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CONNECTIVITY AND TRANSPORT INFRASTRUCTURE

Tong Wu, Jumanne Gomera and Veda Vaidyanathan

MOMBASA-NAIROBI STANDARD GAUGE RAILWAY (SGR)

The flagship BRI project in Kenya, the Mombasa-Nairobi Standard Gauge Railway (SGR) is the biggest infrastructure project in Kenya since its independence and a salient state priority. It was launched before President Uhuru was re-elected in August 2017 and was completed in 32 months-much quicker than the 60 months stated in the contract (Reuters 2017) and was projected to be critical to the growth of Kenya and regional economies.



Photo: Nairobi, SGR Terminus, September 2018

According to the Kenya National Bureau of Statistics (KNBS), Kenya is an economy that is highly dependent on agriculture,

trade, and tourism (KNBS 2019). The SGR allows consumption of cheap foreign goods, and enables enterprises to export locally manufactured coffee, tea, and leather with lower cost. Additionally, it generates improved tourism opportunities and boosts industrialisation. Besides these efforts, the Ministry of industry is building the Naivasha industrial park simultaneously with the second phase of the SGR to enhance economic growth. The SGR connects Mombasa, the seaport city housing the largest port in East Africa to the capital, Nairobi. Mombasa is Kenya's oldest and second-largest city, with a population of 1.3 million in 2017 (Mombasa Invest 2017). Before the construction of the SGR, transportation between Mombasa and Nairobi relied on a meter-gauge railway built between 1896 and 1901 (Kenya Railway) during the colonial era, and a highway called the A109.

The rationale for the SGR stemmed from the fact that the railway was not able to handle the increasing cargo load with some lines removed from service while the A109 highway had high maintenance costs and was accident-prone due to the concentration of heavy-duty transport vehicles. For traveling between these two biggest cities, Kenyans either took very expensive flights (USD 150-200 round trip) or opted for a 12 hour long road trip. The SGR was proposed to remedy these hindrances. The Mombasa-Nairobi SGR has shortened passenger travel time to a little more than four hours and freight transportation to less than eight hours (Global Railway Review 2017).

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Photo: SGR Terminus, Trains Transporting Passengers & Cargo, September 2018

The SGR was first proposed in 2008 by the Kenyan government as a part of the East African Railway Master Plan. The initial plan was to connect Mombasa to Malaba on the border with Uganda and continue onward to Kampala, Uganda's capital city. It will further run to Kigali in Rwanda with a branch line to Juba in South Sudan, giving these countries access to the Mombasa port. A year after the cabinet approval of the project, on October 2009, the government of Kenya and Uganda signed an MoU for construction of the SGR from Mombasa to Kampala (Mutethya 2018). On 28th August 2013, the governments of Kenya, Uganda, and Rwanda signed a tripartite agreement committing to fast track the development of the railway to their respective capital cities. South Sudan came on board soon thereafter (The East African 2014).

As per the agreement, each country will develop the section of railway line falling within its borders. Kenya is developing the Mombasa – Malaba section of the entire proposed network to Kigali through Uganda. The Mombasa – Malaba section is being developed in two phases (Kenya Railway Corporation):

**Figure 4.1. Standard Gauge Railway
New East African railway**



Phase 1: Mombasa – Nairobi: The Mombasa to Nairobi Standard Gauge Railway line.

Phase 2: Nairobi – Malaba: This has been divided into three sub-phases:

- Phase 2A – Nairobi – Naivasha
- Phase 2B– Naivasha – Kisumu including the development of a new high capacity port at Kisumu
- Phase 2C–Kisumu–Malaba (Kenya-Uganda Border)

China Road and Bridge Corporation (CRBC) a subsidiary of China Communications Construction Company (CCCC) - one of the largest State-owned companies that first

entered the international contracting market - was contracted by Kenya Railways to undertake Phase 1 of the Mombasa-Nairobi SGR Project. While China Exim Bank provided the loan, the China Railway Development Company, Apec Consortium Limited and Edon Consultants International (CRDC/APEC/EDON Consortium) won bids for design review and construction supervision (Ayaga 2014).

CRBC's experience covers contracting, investment, development, and operation of a number of roads, bridges, ports, railways, airports, tunnels, real estate, and industrial park projects. Its business extends to nearly 60 countries and includes regions in Asia, Africa, Europe, and the Americas (Wei 2018). Since CRBC entered the Kenyan market in 1984, it has been contracted to build two ports, two railways, and 23 road projects that stretch the total distance of more than 1,200 km in Kenya (China Daily 2014). In fact, a section of the Mtito Andei-Voi-Bachuma Gate Road of the A109 National Highway is known as the "China Road" (China Daily 2014).

According to Kenya railway, the first phase of the SGR to build a 385 km modern railway between Mombasa and Nairobi cost KSH 327 billion (USD 3.8 billion), 90 per cent of which was funded by the Exim Bank of China. The funding was part concessional and part commercial. The loan's interest rate stands at 3.6 percentage points above the six month average of London Interbank Offered Rate (Libor) which serves as an international benchmark, and is to be repaid in 15 years with a grace period of five years (Business Daily 2018). The government contributed 10 per cent of the cost, financed by the Railway Development Fund (Kenya Railways 2017).

SGR phase 1 began operation on the 31st of May 2017 and by the end of November 2018, over 2 million passengers had taken the Madaraka Express (CGTN 2018). The SGR's cargo services were up and running on January 1, 2018, with an average of eight trains per day. It accounts for 44.67 per cent of the total 11,462 Twenty Foot Equivalent Unit (TEUs) lifted by both rail and road transport (KPA 2018). Importantly, it costs only USD 500 to transport a 20ft container from Mombasa to Nairobi on the SGR, half of the USD 1,000 that truck owners charge (Personal Interview 2018).

SGR PHASE II

In 2015, Kenya and China Communications Construction Company (CCCC), CRBC's parent entity, signed an agreement for the construction of the SGR phase 2A, a 120 kilometer railway from Nairobi to Naivasha, which cost USD 1.48 billion (Wanjohi 2019). SGR phase 2A is also financed by the Exim Bank of China, and the construction is expected to be completed within 18 months. CRBC commenced the laying of the railway track on June 2018 (Mghenyi 2018).

SGR phase 2A will link the planned Naivasha Export Processing Zone (EPZ) and Ol Karia geothermal fields to the Nairobi-Mombasa railway. Therefore, Kenya's upcoming export-driven manufacturing and processing industry will not only take advantage of competitively priced geothermal electricity but also benefit from direct transportation to the Mombasa port for export. For the final subphases of SGR phase II (Phase 2B and 2C), Kenya and CCCC had signed an agreement for the construction from Naivasha to Malaba in 2016 (Business Daily 2018). However, the expected loan from China Exim Bank has not been approved yet.

Due to this, the future of SGR phase 2B and 2C and the initial plan to build connectivity from Mombasa to Kigali through Kampala is uncertain. Uganda has completed the feasibility and design for the 293 km long SGR between Malaba (border of Kenya) and Kampala (The East Africa 2016). However, in late 2016, Uganda dropped the plan to connect with Kenya and is considering an alternative line to Tanzania through Port Bell harbor (The East Africa 2017). Simultaneously, Uganda's ability to repay its debts has become an issue since the World Bank suspended lending to Uganda in 2016 (Mwesigwa 2017). According to recent reports in January, 2019, Uganda is still in talks with Kenya and the Exim Bank of China over the construction of SGR as planned (The East Africa 2019). Meanwhile, Rwanda deems this delay unacceptable. Tanzania and Rwanda have, thus, announced the construction of a 571km SGR linking Isaka of Tanzania with Kigali last December (Onyango 2018). After Rwanda's exit and Uganda's uncertainty, Kenya's SGR 2B and 2C may no longer be necessary. As such, operational planning of the SGR's construction has not been up to the mark.

In other domains, more due diligence has been observed. Taking lessons from Tanzania-Zambia railway, which experienced challenges of inadequate manpower to manage the railway, the Kenyan government has signed a 10-year operation and maintenance contract under a "5+5 model" with CRBC (Yun 2017). It includes a service agreement including the train dispatch system, maintenance of the equipment and rail track, and the locomotives. The "5+5 model" means that the Kenyan railway will conduct a performance evaluation of the service by CRBC by the fifth year (Yun 2017).

Data suggests that the SGR project had created over 46,000 local jobs (Mutethya 2019). The SGR project also brought around 2,071 Chinese employees, mainly in management and engineering (Kenya China Economic and Trade Association 2017). Additionally, according to the chairman of CCCC, for the on-going construction of Nairobi – Naivasha SGR line (Phase 2A), has already hired 26,000 locals (Zhongming 2018).

One of the most important elements of the contract signed by the Kenya government and CRBC was the emphasis it placed on training. At the beginning of the Mombasa-Nairobi SGR project, CRBC set up a three-pronged training program for Kenyan railway experts (Personal Interview 2018). The three focus areas included on the job training for local employees in the construction stage, training for railway engineering personnel in the operation stage, and promoting joint education programs in related majors between Chinese and Kenyan universities respectively.

CRBC also worked in cooperation with the Kenyan government to sponsor 60 Kenyan high-school graduates to study at prestigious universities in China (four years in English or five years in Chinese) in railway related majors (Kenya China Economic and Trade Association, 2017). The first group of 25 Kenyans took up the course in 2016 and another 35 enrolled in 2017 (Mutethya 2018). At least 2,000 youth are set to be trained in the operation and maintenance of the SGR, according to the transport secretary of Kenya (Business Daily 2017). Besides training programs, CRBC launched a railway technology transfer training centre at Voi in 2015 to build the capacity of Kenyan technical laborers (Daily Nation 2015).

A Chinese manager, who did not wish to be identified, explained: “Kenya needs a pool of expertise for the future infrastructure projects, the expertise that has been adequately tooled to not only operate the railway, but also to maintain and repair it. We would love to contribute our experience and work on it with Kenyans.”



Photo: Containers at the SGR Terminus, October 2018

The commencement of SGR freight operations have boosted cargo transportation and enhanced efficiency at the port of Mombasa, positioning it as a regional logistics hub. Moreover, the SGR shortened the travel time between the two largest cities and has already ferried two million passengers, significantly increasing local business and leisure trips (Omusula 2018). Ultimately, these will boost the country's economic growth.

Nevertheless there are some serious challenges associated with the operations of the SGR that impede its ability to realise its potential. According to some interviewees, the government forces them to use the SGR for major transportation between Mombasa ports to Nairobi even if this involves delays, thus distorting the logic of supply chains. The new Nairobi clearing office is unable to handle increasing cargo and when the cargo is not cleared in four days, the company is burdened with an onerous USD 25 per day fine. Although using the highway was more expensive than the SGR, businesses had relationships with truck companies which ensured fast and efficient movement of goods.

According to some interviewees, the government forces them to use the SGR for major transportation between Mombasa ports to Nairobi even if this involves delays, thus distorting the logic of supply chains. The new Nairobi clearing office is unable to handle increasing cargo and when the cargo is not cleared in four days, the company is burdened with an onerous USD 25 per day fine. Although using the highway was more expensive than the SGR, businesses had relationships with truck companies which ensured fast and efficient movement of goods.

Considering the quantum of investments going into funding the SGR, it would be natural to assume that opportunities for construction-related local industries would be tremendous as demand for materials such as cement, steel, railway sleepers, and sand required for construction would increase. Interviews with Kenyan officials and Chinese managers confirmed this hypothesis as the terms of the contract indicate that the SGR project is required to purchase all the construction

material locally and utilise 40 per cent of local content in terms of construction materials, civil works, and job opportunities. However, interviews with local entrepreneurs, including cement and steel manufacturers suggested a different reality where they could not compete with raw materials imported from China and were therefore losing business.

Furthermore criticism regarding the cost of the SGR are also aplenty. Kenya's SGR has been compared with Ethiopia's 756-km Addis Ababa-Djibouti line launched in 2016. Both projects were financed by Chinese loans. Ethiopia's rail line is powered by electricity and is more than 250 km longer than Kenya's SGR, which is considered to be more expensive, but it only cost USD 3.4 billion (Kacungira 2017). A report by BBC claims that "at USD 5.6 million per kilometer for the track alone, Kenya's line cost close to three times the international standard and four times the original estimate. Freight costs per kilometer in the region are more than 50 per cent higher than in the United States and Europe, so a more affordable rail option is a relief for businesses" (Kacungira 2017).

When brought up, an official at the Kenyan Ministry of Industry claimed that the SGR has a superior design catering to robust and low-maintenance requirements, thereby making it costlier than the Ethiopian rail. The Kenyan government has claimed that "the design of the SGR given by Kenya are Class 1. Instead, Ethiopia's is Class 2. Kenya's SGR can take double stack containers, which Ethiopia's can't. Kenya also factored in terminals/stations/infrastructure – total of 33 stations, which Ethiopia did not. Therefore, he says, the two projects are not directly comparable."

The question of cost naturally inspires debt-related concerns. Last year, the IMF changed Kenya's debt distress risk from low to moderate

because of its higher level of debt and rising reliance on non-concessional borrowing (Nyang and Changole 2018). Kenya has taken loans from the Exim Bank of China since 2014. While these loans allowed for a five-year grace period, the year 2019 will be the first year the Kenyan government will have to start repaying the loan (Munda 2018). Treasury data tabled in the National Assembly last year shows that principal payments to Exim Bank of China will shoot to nearly Sh34.8 billion (approx. USD 338 million) in the financial year 2019/20 from Sh6.07 billion (approx. USD 58 million) 2017-18, and Sh8.39 billion (approx. USD 81 million) in 2018-19, which raised fears that Kenya may soon become unable to pay the large amounts owed on existing loans (Kangethe 2018).

Additionally, reports accusing Chinese companies of racism and mistreatment of Kenyan workers have also emerged since the SGR project took off. According to reports of the local media, some employees from the SGR project say that Chinese and Kenyan employees are segregated at the workplace and that employment standards are designed in a way that Chinese engineers are suited for better jobs than locals (Wafula 2018). Moreover, construction sites of Chinese contractors in Africa, like in China, contain motivational slogans that appear to alienate local African workers. Meanwhile, some Chinese engineers don't speak fluent English and often cannot explain technical terms precisely. Chinese workers' strict attitudes towards deadlines are also a source of animosity. However the fact that the 'Madraka Express' remains one of the most high-profile Chinese infrastructure projects in the country and even the continent ensures that its success is deemed imperative. Therefore, following up on its progress and examining how challenges are addressed is important.



Photo: SGR Mombasa Terminus, September 2018

Notable developments in the SGR have taken place since the fieldwork for this study was conducted. The SGR phase 2A - Nairobi to Navasha was made operational in October, 2019 (Xinhua 2019). However, SGR phase 2B Navasha to Kisumu and 2C Kisumu to Malaba has not received funding from China Exim Bank. Instead, the government plans to upgrade its 120-years old metre gauge railway to Malaba on the border with Uganda (Olingo 2019) at a cost of USD 210 million with funding from private sector (Okoth 2019).

BUILDING AN AIRPORT IN ZANZIBAR: EXAMINING CHINESE CAPACITY

Zanzibar, a semi-autonomous archipelago in Tanzania, 32 km off the mainland is made up of the island of Unjuga, Pemba and a number of smaller islands. While exports of spices make up 45 per cent of the region's GDP, 25-27 per cent is contributed by the burgeoning tourism sector (Government of Zanzibar n.d.). Understanding the potential of the tourism sector, the Zanzibar Commission for Tourism was set up in 1987 and the Zanzibar Investment Promotion Agency was set up in 1992 to attract foreign investment, especially into tourism projects.

According to the Minister for Information, Tourism and Heritage, Mahmoud Kombo, in 1995, over 56,000 people visited Zanzibar annually - contributing USD 1,971 million to the economy. By the end of 2005 that number had exceeded 100,000 and at the end of 2018 stood at 500,000 (Kombo n.d.). The tourism sector has created around 22,000 direct and 48,400 indirect jobs and contributes to 27 per cent of the Zanzibar's GDP (UNICEF Tanzania 2018). It is projected that by 2020, over half of the island's population would be involved in tourism related activities. This influx of tourists has resulted in the island housing over 20 five star hotels and 263 beach side hotels, thereby competing with other islands like Seychelles, Mauritius and the Maldives. In addition to the 8721 rooms available currently, 5000 more rooms are required to cater to rising demand (Kombo n.d.). One of the critical points of entry for tourists visiting the island are the Zanzibar and Pemba airports which together handled 800,000 passengers as per 2013 data, where 50 per cent of the traffic is from Dar es Salaam while the rest are international passengers.

As the expanding tourism sector necessitated increasing the capacity of the airport, the construction of a second terminal, which upon completion would handle bigger aircrafts, more cargo and serve up to 1.5 million passengers per year was proposed. In 2013, the Chinese government extended a 30 year, USD 73.85 million (CNY 480 million) preferential loan to the government of Zanzibar for expansion work to Abeid Amani Karume International Airport (AAKIA) on Pemba Island (AidData 2017) where the total project area is approximately 23,368 square meters (Personal Interview 2018). The airport construction work includes expansion of the runway, a new apron of

100,000 sq meters that will replace the existing 21,000 sq meters (The Citizen 2018), a 17,000 square meter terminal, the building of Terminal II, a utility house, a generator house, fire fighting water tanks, civil works, electrical and mechanical installations, fittings, fixtures and furnishings, operational and immigration counters, passenger seats and associated accessories (Personal Interview 2018).

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Although this is one of the most high profile Chinese projects in the island, Zanzibar has already been a recipient of Chinese investment. Three main projects including one on economic and technical cooperation, another for the rehabilitation and upgrading of Abdullah Mzee Hospital in Pemba and one providing scanning equipment for container inspections at Zanzibar Port were signed, among 16 agreements entered into between the governments of Tanzania and China (China 2013). Cooperation has also included a fisheries training programme at the Fujian Institute of Oceanography, funded by the China's commerce ministry in 2017 (Godfrey 2018). 26 medical teams from Jiangsu province have visited Zanzibar to treat local patients and train local doctors, with the first team arriving in 1964 (Zhongming 2016).

The designing of the Zanzibar Airport Terminal 2 project began in 2010 after the agreement was signed in 2009 in the design and build format and was expected to be operational

in 2014 (Khamis 2018). The feasibility study for the project that included an environmental impact assessment was carried out by the government of Zanzibar after which China Exim hired a consultant and 'improved on it' (Personal Interview 2018). No local companies or technical staff from the ministry (MOICT) or Zanzibar Airports Authority (ZAA) were part of the design team. Beijing Construction Engineering Group (BCEG), a company with a contract volume of USD 2.39 trillion in Tanzania from 2004 to 2010, is the main contractor while design was performed by the Beijing Architectural & Engineering Design Co. Ltd (BAED). According to a BCEG representative, "the new terminal will be the landmark of the Zanzibar region and the whole of Tanzania" (Ying, 2011).

However, after spending half the loan amount of USD 35.2 million on building the new terminal it was found that while the airport was designed for Code E aircrafts like Boeing 777, there wasn't sufficient space between the taxiway and the aerobridge (Personal Interview 2018). This incredibly expensive mistake was attributed to lack of oversight and coordination and resulted in the dismissal of the Turkish consultant hired for the project (Personal Interview 2018). They were replaced with a French consulting company Aeroport De Paris Engineering (ADPI) which provided two mitigation options; the first involved demolition and restarting construction. The second entailed retaining it and shifting the code to the south. As USD 35.3 million had already been spent, the second option was deemed more suitable. The contractor blamed the delay in construction to varying expectations of client - from the initial building area of 17, 000 sq. m, it was later increased to 25,000 sq m. and original

capacity of 1.1 million was later augmented to 1.6 million (Personal Interview 2018).

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70.4 million. They are working on good faith, although the money hasn't come through." (Personal Interview 2018).



Photo: Zanzibar Airport Construction site, 2018

However, it was found that to complete construction, additional funds of USD 58 million were required which increased cost of the project to 128.147 million, much higher than the originally projected 70.4 million (Personal Interview 2018). Due to failures incurred in the design and the substantial variation in costs, the project was suspended in 2013 and later again in 2015. According to the project coordinator for the Zanzibar government, suspension of the project was a big blow. "We had told the President that we would do it before elections in October 2015", the coordinator said. Although there were fears that China's Exim bank would not release the additional funds and the project would have to be abandoned midway, a high level official from the Communist Party of China who visited the project site, assured its completion (Personal Interview 2018). Importantly, however, it needs to be noted that the contractor for the project continued working on the site even after China Exim had suspended funding. According to an official, speaking on condition of anonymity "... although 35.2 million was already spent, total value of work done by contractor exceeded

In conversations between the contractor and the new French consultant, ADPI, one of the challenges pointed out was of language (Personal Interview 2018). As there were substantial communication lapses between the Tanzanian operator, the French consultant and Chinese contractors, they created their own code names for various components so that ideas do not get lost in translation. "It's like we created own personal dictionary", said an interviewee. Conflict of interests between the consultant and the contractor was also highlighted, "the contractor tries to work cheapest while the consultant emphasises on the quality, this naturally leads to differences in approach". In addition to these challenges, there was also a difference in standards. Design and execution of the works comply with local laws and other standards specified in the employer's requirements while Chinese standards prevail over other local and international standards in remaining areas. Although 90 per cent of Chinese standards are recognised by ILAC, IATA, ICAO and the British Standards were applied to the fire and safety systems (Personal Interview 2018).

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The definition of training by the Chinese contractor did not seem to be in sync with that of the officials. “We are not here to provide a five year engineering degree...we will provide training on specific parts of machines to those who are already familiar but not provide general training” (Personal Interview 2018). However, according to the consultant, the ZAA technicians do not have the capacity to operate and run the terminal as per the required standards. Capacity development, though required, is not part of the contract.

Additionally, only a small part of materials such as cement, food, transport services, cables, pipes and aggregates were locally procured. Most of the materials were sourced from China. This was partly because local inputs did not meet quality specifications of the project (Personal Interview 2018). It was also pointed out, however, that China EXIM bank funding requires Chinese contractors to source some of the material from China. Interestingly the elevators, which were sourced from a French company, were also manufactured in China (Personal Interview 2018).

Currently, 51 per cent of the work has been completed and the aim is to finish construction before elections in 2020 (Personal Interview

2018). The funding agency, China Exim has also made it clear that it will not be providing any additional funds, so the stakes are high to finish the project on time and within financial constraints. As for the repayment of the loan, the plan is to create an escrow account with a percentage paid to Exim and another percentage to operators. Tanzania Civil Aviation is to be the relevant regulator involved while the Tanzania Airport Authority and the Zanzibar Airport Authority will be the operators and managers of the airport respectively (Personal Interview 2018). According to officials, there is considerable demand from Arab countries to introduce carriers like Emirates to the island, so Tanzanian officials are positive that the loan can be repaid on time.

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The case of the Zanzibar Airport project is interesting on many counts and provides a unique perspective into evolving China-Tanzania relations. What sets this particular case apart is the several funding constraints, delayed construction and despite the suspension of funding, the Chinese contractor continued construction, suggesting that tacit support from the Chinese state has been forthcoming. Another important point that the case highlighted was the use of Chinese construction standards over local or international standards.

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POWER AND COMMUNICATION INFRASTRUCTURE

Veda Vaidyanathan and Jumanne Gomera

NATIONAL ICT BROADBAND BACKBONE (NICTBB)

A developed Information and Communications Technology (ICT) sector is generally a salient priority of developing nations. Numerous studies observe a significant positive relationship between economic growth and investments in ICT, and the internet in particular ('Vu n.d.; Farhadi et. al. 2012; Kundishora n.d.; McKinsey Global Institute 2011). According to a study sponsored by Vodafone, an extra 10 phones per 100 heads results in GDP growth of 0.6 per cent per annum (Vodafone 2005). Another study by the World Bank observes a 1.38 percentage point increase for each 10 per cent

increase in ICT penetration (World Bank 2009). Greater internet usage is also associated with the profitability, productivity, competitiveness and internal organisation of Small and Medium Enterprises (SMEs) (Guerriero 2015). It enhances productivity in diverse activities ranging from agriculture to education (Chavula 2013; Butcher 2003). ICT advancement in the form of mobile phone penetration is also associated with a positive income-redistributive effect in Africa, attenuating inequality (Asongu, 2013). Emphasising the imperative to avert a "digital divide," Castell (1998) states that ICT is "the critical factor in generating and accessing wealth, power, and knowledge in our time."



Photo: Research Team at NICTBB Office, October 2018

This is particularly true in Africa. As per a 2013 report, "Internet could transform sectors as diverse as agriculture, retail, and health care - and contribute as much as USD 300 billion a year to Africa's GDP by 2025" (McKinsey 2013). Moreover, a recent Pew poll finds that in Sub Saharan Africa "large majorities say the increasing use of the internet has had a good influence on education in their country, and half or more say the same about the economy, personal relationships and politics" (Pew Research Centre 2018). Conversely, a 2017 report estimates that internet disruptions have cost Africa USD 237 million per year since 2015 (CIPESA 2017). As such, development of ICT, internet connectivity and its application is receiving a lot of attention from policymakers on the continent.

The United Nations Economic Commission for Africa (ECA) has identified ICT as a major thrust since 1996 and has called upon African leaders to develop plans to bridge the digital divide and herald an information age in Africa (UNECA 1996). Grasping the benefits of ICT, numerous African countries have designed and implemented their telecommunication and internet development plans accordingly through many phases. Collective efforts have intensified as well. The African Union's New Partnership for Africa's Development (NEPAD) established two organisations, namely the African Telecommunication Union (ATU) and the African Connection, to facilitate the process. These efforts include introducing ICT to education and enterprises in order to reduce poverty. Tanzania has been no exception and China has emerged as a crucial partner in its endeavours.

Grasping the benefits of ICT, numerous African countries have designed and implemented their telecommunication and internet development plans accordingly through many phases. Collective efforts have intensified as well. The African Union's New Partnership for Africa's Development (NEPAD) established two organisations, namely the African Telecommunication Union (ATU) and the African Connection, to facilitate the process.

GENESIS OF THE NATIONAL ICT BROADBAND PROJECT

ICT has been a major thrust in Tanzania's effort to achieve middle income status. It features prominently in some of Tanzania's most important policy documents such as the Tanzania Development Vision 2025, Rural Development Strategy of 2001 and the National Strategy for Growth and Poverty Reduction (Mkukuta) of 2006, which calls for all villages to have access to telecommunications services by 2020 (Economic and Social Research Foundation 2008). Likewise, the Tanzania National Long Term Perspective Plan sought to provide telecommunication service facilities to every village by 2020 (Planning Commission 1999). Conceptual momentum was achieved with the release of the National ICT Policy in 2003 which envisioned making Tanzania a hub of ICT infrastructure and ICT solutions that enhance sustainable socio-economic development and accelerated poverty reduction both nationally and globally (NICTP 2003). The principle of "Universal Access" was emphasised in the policy, with the aim of consciously endeavouring against

the exacerbation of the digital divide within Tanzania and extending connectivity to the last mile.

The NICTP 2003 came at a time when reforms in the telecommunications sector had begun picking up momentum. A decade earlier, with the Communications Act 1993, Tanzania paved the way for liberalisation of the telecom sector away from the monopoly of the Tanzania Telecommunications Company Limited (TTCL). Concomitant to the NICTP, in 2003, the Tanzania Telecommunications Regulatory Agency (TRCA) was established to “promote competition and economic efficiency, protect consumer interests, grant licenses and enforce license conditions, regulate tariffs, and monitor performance” (Behitsa and Diyamett 2010). As such, the policy provided a much needed impetus in its transition to a knowledge and information based economy. Thereafter, Tanzania witnessed a surge in mobile network providers under a liberalised licensing arrangement. With exclusivity in the telecommunications sector all but extinguished by 2005 (Esselaar and Adam 2013), mobile penetration figures rose from 10 per cent in 2005 to 41 per cent in 2009, a fourfold increase (Pazi and Chatwin 2013). According to Behitsa and Diyamett (2010), “Tanzania’s telecommunications sector was the fastest growing sector of the economy in 2009, recording 21.9 per cent growth, up from 20.5 per cent in 2008.”

With respect to internet connectivity, however, Tanzania came up against significant hurdles. It became abundantly clear that Tanzania’s ICT policy lacked robust implementation mechanisms (Economic and Social Research Foundation 2008). This is further evidenced by the trends in internet penetration at the time.

While internet penetration increased from a negligible 0.3 per cent in 2000 to a meagre 6.7 per cent in 2005, by 2009 the figure slid back to 1.3 per cent (Makondo and Wang 2015). Tanzania lost about a third of its internet users during that period, while the population tripled. The Tanzania National ICT Policy (NICTP) 2003 highlighted the fact that a lack of ICT infrastructure in Tanzania and the resultant reliance on expensive global internet networks and satellites had the effect of excluding much of the nation’s population from data services (NICTP 2003).

Prior to the installation of Backbone, Tanzania depended entirely on expensive satellite bandwidth and low capacity for domestic and international linkages (Main 2001: 94). In addition to that, it was deprived of advanced and modern technologies, primarily due to high costs of sourcing and updating to modern technology; restrictive patent rights acquisition, and limited knowledge on new technologies (Main 2001: 94). Moreover, due to limited contribution of the private sector to R&D, mainly due to weak incentives to invest, there was low understanding and appreciation of the financial and economic advantages of adopting new technologies and weak multi-stakeholder platforms and partnerships.

The National ICT Backbone (NICTBB) was formulated in this backdrop. It consists of 25,954 kilometres of optic fibre cable (OFC) backbone covering 26 regions of mainland Tanzania and Zanzibar (see Appendix A5A.1 and 5A.2). Planning for the NICTBB had started in 2005, with a feasibility study conducted by the government of Tanzania (GoT), Worldtel and the China International Telecommunications Construction Corporation (CITCC). This resulted in the signing of a Technical Contract

in 2007 between GoT and CITCC. Meanwhile, in 2006, the GoT had implemented a modest refurbishment of existing transmissions being utilised by electricity, railway and natural gas companies in the country (Esselaar and Adam 2013). Project implementation was split up into five main stages and construction commenced in 2009. The NICTBB is operated by TTCL as a wholesale business that is engaged in lease of capacity to Tanzania's licensed operators, i.e. mobile network operators, Internet Service Providers (ISPs), local television and radio stations, Fixed Network, Fixed Wireless, and Voice and Data Service Providers. OFC allows for scaling up the broadband connectivity, access, and the provision of various services nationally and abroad to landlocked countries in the region, as was outlined in Tanzania Five Year Development Plan I 2010/2011-2014/2015 (Personal Interview 2018).

According to the Ministry of ICT, the NICTBB project implementation processes underwent the following steps:

- In 2005 the feasibility study was conducted by the GoT, Worldtel and China International Telecommunications Construction Corporation (CITCC);
- In 2007 the feasibility study was carried-out by the GoT and CITCC in order to divide the project into two components;
- The Technical Contract (No. 010/CONT/GJB/2007) was signed in 2007 between the GoT and CITCC;
- In 2008, the GoT signed the Concessional Loan Agreement with a total amount of USD 70 Million from the Exim Bank of China for the implementation of the NICTBB Phase I; a Steering Committee and Technical Team was also set up for

the supervision of the NICTBB project implementation; TTCL was asked to be fully involved in project implementation;

- In 2010, a Concessional Loan Agreement of USD 100 Million was signed with the Exim Bank of China for the implementation of the NICTBB Phase II;
- In 2011 the feasibility study was conducted between the GoT and CITCC to establish the project requirement and cost for the implementation of Phase III project;
- In 2013, the GoT signed the Concessional Loan Agreement with a total amount of USD 93.77 Million from the Exim Bank of China for the implementation of the NICTBB Phase III Sub phase I;
- In 2014 the review of the feasibility study report of 2011 was conducted in order to reflect the current situation and include new requirements for the implementation of the NICTBB Phase III Sub phase II. The review of the feasibility study report was done between the GoT and CITCC; and
- The feasibility study of 2014 reviewed in 2017 by the GoT through an independent Consultant. Recommendation to form PPP arrangement between GoT and a Consortium of Operators already working in the country to include other fibre optic infrastructure initiatives.

The NICTBB project involves a number of local stakeholders, from government, business and consumer society, as well as external players such as financiers and contractors. Each of these players has a varying degree of influence and interest as far as ICT development is concerned. The government operates mainly on

the policy level and ensures availability of ICT infrastructure. On the business side, it is more utilisation and services provision. Consumers desire to have untrammelled access and affordable tariffs. China's intervention plays a role in placating each of these stakeholders (Personal Interview 2018).

Chinese companies are among the most important players in the Tanzanian ICT sector. Companies such as Huawei provide a range of goods and services that include Wireless Network, Fixed Network, Cloud Core Network, Carrier Software, IT, Network Energy; Enterprises products such as Cloud Computing, eLTE Broadband Trunking, eLTE Broadband Access, Intelligent Video Surveillance, Routers, Security, Servers, Storage, Switches, Telepresence & Video Conferencing to industries such as banks and Government departments. The National ICT Broadband Backbone (NICTBB) is being implemented in five main phases. Phase I, II and III Sub-Phase I are completed and operational. Other NICTBB activities include expansion and optimisation of the existing transmission network, the overlaid IP/MPLS networks built to provide high-speed data/internet services, as well as commissioning of the National Internet Data Centre (IDC) for hosting IT services.

According to the Tanzanian ministry of finance and planning, the major network elements of the NICTBB infrastructure are being constructed by the China International Telecommunication Construction Corporation (CITCC) at a total cost of CNY 1,825 million; equivalent to USD 263.8 million. As elaborated above, the project is mainly financed with a concessional loan extended by the Export-Import Bank of China (China Exim Bank) (World Bank 2018) and the various phases of its operation are illustrated below.

NICTBB PHASE I

The implementation of the NICTBB Phase I commenced in 2009 and its construction was completed in 2010. It covers a total distance of 4,330 km, of which 2,280 km belongs to a newly built Optic Fibre Cable (OFC) network while 2,050 Km of cables were existing OFC network from TANESCO. During this Phase, the NICTBB was connected to the international submarine cables of EASSy & SEACOM and cross-border connectivity was achieved through linkages with neighbouring countries namely Kenya (at two points of Sirari na Namanga), Uganda (at Mutukula), Rwanda (at Rusumo), Malawi (at Kasumulo), Burundi (at Kabanga) and Zambia (at Tunduma). The construction cost USD 70 million.

NICTBB PHASE II

The implementation of the NICTBB Phase II commenced in 2010 and was completed in 2012 with a total distance of 3,230 km from which 3,168 km of a newly build OFC network while 62 km of the existing OFC network from TANESCO. During this Phase, the NICTBB was connected to neighbouring countries namely Kenya (at Horohoro) and Burundi (at Manyovu). An amount of USD 100 million was spent in this phase. The implementation of the NICTBB Phase I and II brought the total distance of 7,560 km which comprised of 5,448 km of the newly built OFC network and 2,112 km of the existing OFC network from TANESCO. It became operational in June, 2012.

NICTBB PHASE III

Phase III is enhancing the national backbone infrastructure to have a footprint and a service point at each district headquarters; establishing a full-mesh Internet Protocol

Layer, Multiprotocol Label Switching (IP-MPLS) to the existing Dense Wavelength Division Multiplexing (DWDM) and Synchronous Digital Hierarchy (SDH) layers; implementation of Data Centres for hosting IT services, implementation of the public key Infrastructure, and connecting Zanzibar to the NICTBB infrastructure.

The total investment required for Phase III of the NICTBB is estimated at USD 403 million. In 2013 an amount of USD 93.77 million was secured for implementation of the first sub phase (Sub Phase I) of Phase III. The implementation of Phase III Sub Phase I started in December, 2013 and comprised expansion of the existing NICTBB network and connecting Zanzibar and Pemba to the NICTBB, establishing a full-mesh Internet Protocol layer Multiprotocol Label Switching (IP-MPLS) to the existing Dense Wavelength Division Multiplexing (DWDM) and Synchronous Digital Hierarchy (SDH) layers, as well as the implementation of one Data Centre in Dar es Salaam for hosting IT services. The sub phase was completed in June, 2016, and become operational in September, 2016.

The implementation of the NICTBB Phase III Sub Phase II also includes the construction of two Internet Data Centres in Dodoma and Zanzibar, extending the NICTBB infrastructure to have a footprint and a service point at each district headquarters, and implementation of Public Key Infrastructure (PKI). A total amount of USD 309 million is required for the implementation of this and construction is yet to start as China Exim has not yet disbursed the required funds.

NICTBB PHASE IV

Phase IV involves a public private partnership arrangement between the GoT and the Consortium of Operators namely Tigo, Zantel

and Airtel. Vodacom is also in the process of joining this arrangement. The project components include building the Metro Optic Fibre Cable Networks in Urban Areas and Missing Links in areas where the NICTBB does not yet reach. The project aimed to cover 3,000 kilometers using a total amount of USD 80 million. To date, the total distance completed is 2,595 kilometers at a cost of USD 53 million, covering the administrative regions of Dar es Salaam, Mwanza, Arusha, Dodoma, Morogoro, Shinyanga, Tanga, Moshi and missing links from Dar es Salaam to Arusha, Dodoma to Mwanza and Morogoro to Ifakara.

NICTBB PHASE V

This phase includes implementing the last mile broadband connectivity nationwide and is intended to provide access to the metro networks in urban areas. Moreover, initiatives like GovNet projects whereby 72 MDAs and 77 LGAs are connected to the NICTBB. It includes the Higher Learning and Research Institutions (HERIs) project whereby 32 campuses were connected to the NICTBB. Other PPP projects such as connecting 150 district councils, 150 district hospitals, 150 district police stations, 65 post offices and provision of mobile services to 4,000 villages will be implemented in this phase. The estimated investment for this Phase is USD 1.35 billion (World Bank 2017).

The benefits of ICT advancement facilitated by the NICTBB accrue to numerous sectors of Tanzania's economy including banking, education, tourism, health, agriculture. Interviewees revealed that the NICTBB is expected to bring connectivity prices down by 99 per cent. In addition to e-services, the NICTBB allows for information based operation in government and has improved fiscal management (Pazi and Chatwin 2014) - it was

learnt through interviews that the NICTBB will connect 72 central government and 77 local government agencies - thus allowing for better coordination. Local stakeholders expressed satisfaction with the Chinese intervention in Tanzania's ICT sector, stating that the project's financial obligations were made manageable by the low interest rates and long maturity periods offered by the Chinese financier (although precise figures were not disclosed by the interviewee). In other domains, however, the outcomes are more of a mixed bag.

The benefits of ICT advancement facilitated by the NICTBB accrue to numerous sectors of Tanzania's economy including banking, education, tourism, health, agriculture.

The ICT industry faces both opportunities and challenges across countries (Bakari, et.al 2005; Bakari 2007). Tanzania is not an exception. Cyber attacks, crime and national security have come to the attention of African countries. While Tanzania has enacted a number of laws to cope with ICT development (The Cybercrimes Act 2015; The Statistics Act 2013; The Media Services Act 2015; The Access to Information Act 2015), there are still concerns about national security and it is one of the key issues the ministry of ICT is trying to tackle.

It was noted that while some locals were sent to China to get trained to operate the NICTBB and others were provided on-the-job training, most of the experts were still called in from China. Moreover, local suppliers were tapped only for the construction of the building that houses the National Data Centre, meaning that Chinese companies handled all production of assets at the higher end of the value chain. Chinese contractors cited issues such as limited education levels, low skill levels, weak

monitoring of quality and standards of hardware and software and low awareness and usage of open-source software, as impediments to a more meaningful transfer of technical know-how to Tanzanian stakeholders.

While there is general agreement that capacity development and skills transfer to locals is crucial for operating, maintaining and sustaining the project, these still remain inadequate (Bessant and Rush 1995). While the Tanzanian stakeholders have expressed a preference for skill transfer, the contractor has been ambivalent over whether the Tanzanian stakeholders could be trained sufficiently to operate and maintain the project. For the contractor, skill transfer is contingent upon the prevailing quality of human resources and the contractors in the case of the NICTBB were convinced that the locals were not sufficiently endowed to grasp the high-tech training.

This observation aligns with that made by Makundi, Huyse and Develtere (2016), who find sub-optimal levels of technology transfer in the NICTBB despite a 60 per cent labour localisation rate of the Chinese companies. The same factors also threaten the post-development operation of the NICTBB - paucity of skilled human resources has resulted in the lack of a supervisory budget for the project, casting significant doubts on whether the benefits from the project will be fully realised. The Chinese financiers of the NICTBB did not see it fit to include monitoring and evaluation as part of the contract, and were more intent on proceeding with construction. This is arguably a point of departure vis-a-vis World Bank projects, wherein the operability of funded infrastructure is generally contractually ensured and monitored. In the case of the NICTBB, while Chinese stakeholders have certainly built ICT capacity in Tanzania, they have not done enough to enhance the capabilities of local stakeholders that will operate it - both are required in order to derive benefits from the project.

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In addition to the above challenges pertaining to human resources, certain costs pertaining to the NICTBB have been elevated due to the tied nature of Chinese financing. For instance, the Backbone is constructed in a manner that only Huawei routers are compatible, precluding substitutability by cheaper routers such as those produced by Cisco (Vota 2011). This is of significant consequence. Firstly, in the long run, such construction serves to cement Chinese technical standards in the East African ICT ecosystem. Huawei is poised to enjoy a competitive edge in subsequent bids to construct ICT infrastructure in the region due to its existing construction. Secondly, it causes broadband prices, which are already volatile (Esselaar and Adam 2013) to remain high relative to rural incomes (Byanyuma et. al. 2018) leading to lower demand and a persistent digital divide.

Aspersions are already being cast over whether the NICTBB is actually contributing as much as was expected. It is estimated that as much as 70 per cent of the Backbone goes unutilised (Kasumuni 2017). Sedoyeka and Sicilima (2016), in stakeholder interviews, found that high prices

were the most frequently cited reason behind under utilisation of the NICTBB, indicating that inefficiencies have not been ironed out even as construction continued apace. Observers find it likely that Tanzania's internet penetration figures are considerably overstated for political reasons (Esselaar and Adam 2013). The World Economic Forum estimated Tanzania's internet penetration at 13 per cent in 2017-18 (TCRA claims it to be 45 per cent), ranked 126th out of 137 countries (World Economic Forum 2018). Similarly, BMI Research, estimated penetration levels in 2016 to have been merely 4.4 per cent, well below TCRA's estimated 40 per cent (BMI Research 2016). Even as per more optimistic figures, Tanzania lags behind its East African neighbours - Kenya and Uganda both had higher internet penetration in 2014 (Haji et. al. 2017).

Some instances of vandalism of the infrastructure have also raised maintenance costs of the digital infrastructure. One interviewee emphatically stated that recipients of infrastructure are to blame for ensuring quality and efficient operation as opposed to the Chinese contractors. This is certainly true. Financiers, however, are another story, and must be held to a higher standard than contractors. It would appear that the Chinese Exim Bank did not deem it necessary to factor in Tanzania's institutional antecedents while sanctioning funds towards the NICTBB, arguably lending credence to the hypothesis that China's priority has been to "construct for constructions' sake" and, thus, applies less conditionalities to projects. Currently the project is 100 per cent operational for phase I to III and part of phase IV, while the remaining phases are waiting for funds. Additionally, a draft of cyber security strategic plan has been sent to stakeholders for awareness and opinion before it is approved and become operational (Personal Interview 2019).

MTWARA – DAR ES SALAAM NATURAL GAS PIPELINE PROJECT

Energy supply is widely acknowledged to play an integral role in an economy and in more than one capacity. Not only is it utilised as an input in manufacturing activities, it is also an essential final consumption good for households. It is, therefore, considered a necessary condition for facilitating economic growth (IEA 2004). In the case of households, energy demand is said to be mainly driven by income levels. As such, should the aggregate economy grow at a rate faster than energy generation, it will reflect in slower welfare growth. This is reportedly the case in Sub Saharan Africa, where only 23 per cent of the continent has access to electricity, with large disparities between countries and between urban and rural areas within countries (UNECA 2007). Likewise International Energy Agency (IEA) (2002) reports that the urban and rural electrification rates in SSA up to year 2000 were approximately only 51.3 per cent and 7.5 per cent, respectively.

With respect to producers, energy is usually regarded as the key driver of output growth. As highlighted in a 2003 report, not a single country in the world has advanced from a subsistence economy without access to energy (World Bank 2003). Numerous studies have vindicated the overweening importance of energy generation in economic growth (Ghali and El-sakka, 2004; Wolde-Rufael, 2009; Lee and Chien, 2010; and Lorde et al 2010). Theory also supports the case for a linkage between energy and growth. One standpoint proposes that energy is an indispensable factor of production because other sources such as labour and capital cannot function without it. Masih (1997) posited the feedback hypothesis which states that energy consumption and Gross Domestic

Product simultaneously impact each other in a mutual feedback. In this case shocks (whether positive or negative) to either one of the variables would have impacts, sometimes even permanent, on the other. While there is skepticism among proponents of the neutrality hypothesis, which holds that changes in energy consumption have very little explanatory power in GDP growth, this ignores the national heterogeneity of the energy consumers.

IEA (2005) has stipulated that, the link between energy consumption and economic growth is highly influenced by the stage of economic development and living standard in a certain region. As stated by Toman and Jemelkova (2003) “...the linkages among energy, other input, and economic activity clearly change significantly as an economy moves through different stages of development”. This implies that the causal link is likely to vary among countries at different stages of development with increasing returns likely to be incurred at a lower stage. Tanzania’s energy infrastructure operates at a level well below the growth maximising level. For this reason, China’s intervention in Tanzania’s energy generation infrastructure is of much consequence.

Tanzania is proactively diversifying its energy basket with the help of natural gas, which in 2015 accounted for 34 per cent of electricity production, a marked departure from the previous domination of hydroelectric power (Planning Commission 2016). Diversification has long been an imperative for achieving a consistent power supply in the country, since hydro power generation is generally faced with a substantial degree of uncertainty on account of the unpredictability of weather and climate change factors. It has been reported that electric capacity generation increased from 900 MW in 2010 to 1,246.24 MW in June, 2015 (Planning Commission 2016).

Completion of the Mtwara-Dar es Salaam gas transmission pipeline and production plants in Dar es Salaam such as Kinyerezi have been instrumental in narrowing the gap between supply capacity and demand (Planning Commission 2016). The main challenges plaguing the energy sector in Tanzania include low access (for both urban and rural populations), high costs of power production, distribution and transmission (Ahlborg and Hammar 2011). Excessive reliance on Hydroelectric Power (HEP) has crowded out investment in other sources of energy generation, impeding diversification. Moreover, state monopolies in generation and distribution have stifled competition and tolerated entrenched inefficiencies in electricity supply. Inefficiencies of the parastatal organisation overseeing electrification, the Tanzania Electric Supply Company Limited (TANESCO) result in costly emergency power production contracts and have adversely affected industrialisation and economic transformation. With respect to distribution, inadequate efforts to expand customer base and optimally serve clients have also effected the sector's productivity.

The main challenges plaguing the energy sector in Tanzania include low access (for both urban and rural populations), high costs of power production, distribution and transmission (Ahlborg and Hammar 2011). Excessive reliance on Hydroelectric Power (HEP) has crowded out investment in other sources of energy generation, impeding diversification. Moreover, state monopolies in generation and distribution have stifled competition and tolerated entrenched inefficiencies in electricity supply.

Swift reform is required to further revamp performance of this critical sector in order to support industrialisation. Currently, there are

proposed reforms intended to separate powers in the following key functions: determining power purchasing tariffs, management of the power master plan, and power transmission.

While the Mtwara region has been known largely for its cashew nuts production, the discovery of natural gas in the area promises to alter its role in the national economy. Thus, the Mtwara – Dar es Salaam Natural Gas Pipeline Project implemented under the National Natural Gas Infrastructure Project (NNGIP) has emerged as a salient component of the overall national energy strategy that embodies Tanzania's desire to diversify its energy basket. The construction of the pipeline is expected to increase government tax revenues as well as improve the living standards of the local population in Mtwara. Multinational companies are vying for a stake in the region, making Mtwara a destination for foreign capital.

That being said the expected windfall has also emerged as a source of contention within the country and the region. Certain types of conflict over natural gas resources are frequently and readily observable. As Ndimbwa (2014) describes, disputes have arisen over the manner in which the energy is distributed, with the local authorities in Mtwara expressing displeasure over the transportation of natural gas resources out of the region. They naturally prefer the construction of a power plant in their area in order to maintain control over the use of the resources. Swanepoel and De Beer (2006) emphasise that local communities in the vicinity are likely to agitate if the profits accrued from their lands do not visibly alter living standards. Furthermore, ambiguity in the construction process also creates dissonance between the central and local authorities in Tanzania.

Table 5.1 Tanzania Electricity Production Plan

Sl. No	Indica Target	2014/15	2020/21	2025/26
1	Electrical Power (generation in MW)	1501	4,915	10,000
2	Electricity – Regions connected to national grid	19	23	26
3	Electricity – national grid length (in km)	4901	9511	13,165
4	Electricity – Per capita consumption (KWh)	108	377	490
5	Reduced Power losses (%)	19	14	12

Source: Tanzania National Five Year Development Plan 2016/17 – 2020/21

China has played an instrumental role in the construction of the Mtwara – Dar es Salaam Natural Gas Pipeline Project. The project started with a government to government agreement, where it was decided that funding would be of the non-concessional type. The primary funder for the USD 1.2 billion initiative is the EXIM bank of China, with the contractors, China Petroleum Technology & Development Corporation (CPTDC) and the China Petroleum Pipeline Engineering Corporation (CPPEC), acting as additional donor agencies. Tanzania signed a contract with the three Chinese companies on 21 July 2012 to start construction of the 512 km pipeline leading from Mtwara to Dar es Salaam. In addition to the loans from the Chinese funders, grants were disbursed by the World Bank (USD 300 million) and the African Development Bank (USD 200 million) (Anthony 2012).

Most officials interviewed reported that more than 75 per cent of the project materials came from the Chinese contractors, CPTDC and CPPEC as no local companies had the capacity to undertake the project's main components. The locals were involved in the supply of food, transportation, aggregates and cement. Two feasibility studies were conducted, first by TPDC and then by the Chinese funders. The Chinese contractor was responsible for Engineering, Procurement and Construction (EPC model). The CPPEC has extensive

experience undertaking construction in Africa. They have constructed over 20 projects in more than ten African countries. The Mtwara to Dar es Salaam gas pipeline construction is expected to turn Tanzania into the third largest gas exporter in the world. However, the project encountered a series of violent protests from local communities residing in the region.

In December 2012, prior to the commencement of construction, there were plans to build a gas processing plant in the city of Mtwara. The local authorities and community were, thus, expecting to reap the benefits of the newly discovered natural gas directly. During planning phases, promises were made that such a processing site would boost local community development. As such, the decision to construct a pipeline to transport the resources from Mtwara to Dar es Salaam, was regarded by the local community as an act of marginalisation.

The management, distribution and protection of natural resources and other related ecosystems has often been a contentious issue among African communities (Mwesiga and Mikov 2017). These conflicts hamper centre-state relationships and have debilitating impacts when conflicting parties fail or refuse to engage in dialogue or dispute resolution (Lake and Rothchild 1996). Societies without institutional settings for smooth conflict resolution can be drawn into years of agitation and violence,

particularly in instances of instability (Anthony 2012). Therefore, natural resource discoveries presents both an opportunity and a challenge to societies and policymakers.



Photo: Interview, China Petroleum Pipeline Engineering Corporation

In the case of Mtwara, the Tanzanian government has taken innovative measures to deal with resistance from the local population. One way was to educate the local leaders and create awareness about the benefits the pipeline will accrue to the community. Leaders from different local factions including the religious head, the ward executive officer and other village leaders were sent abroad to learn about the benefits of similar gas pipeline projects. As such, the authorities acknowledged that community involvement, particularly during the early phases of construction helps create a sense of ownership and will foster sustainability. Local leaders, at different levels and factions, finally extended support to the project once they were assured of their stake in it. Thus, grassroots involvement enabled Tanzanian authorities to deal with dissent in Mtwara. The Mtwara gas pipeline is not the only case where protests against government policy have been observed, and the case can inform policy makers on the best way to deal with dissent in the future.

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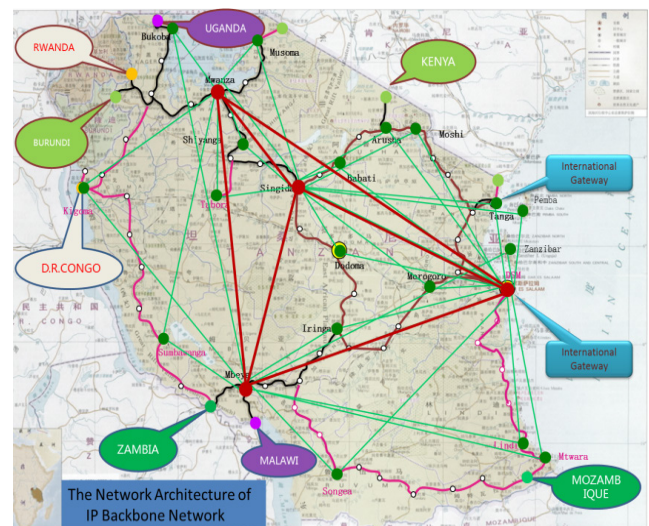
APPENDIX 5A

Figure 5A.1: Tanzania Network Architecture of the IP Backbone network



Source: Ministry of ICT, United Republic Tanzania

Figure 5A.2: Tanzania National ICT Backbone (NICTBB) Map



Source: Ministry of ICT, United Republic of Tanzania

CONCLUSION

Veda Vaidyanathan

Chinese companies are dominating the infrastructure markets in East Africa, accounting for 54.7 per cent of all construction in the region (Deloitte, 2018). This research reveals that the advantages can be attributed to a multitude of factors including competitive pricing, access to a comprehensive industrial chain in China, quick mobilisation of construction equipment and vessels resting across Africa, easy acquisition of cheap raw materials to low salaries paid to high skilled engineers, an entrepreneurial culture and low local competition.

finished before schedule, they enjoy a certain degree of popularity among African officials.

China is therefore exporting an ecosystem of 'efficiency-innovation' through its infrastructure projects in Africa. Similarly, their familiarity of operating in African markets was also listed as a huge advantage, with several projects finished before schedule, they enjoy a certain degree of popularity among African officials.

This research reveals that the advantages can be attributed to a multitude of factors including competitive pricing, access to a comprehensive industrial chain in China, quick mobilisation of construction equipment and vessels resting across Africa, easy acquisition of cheap raw materials to low salaries paid to high skilled engineers, an entrepreneurial culture and low local competition.

Additionally, the experience of operating in China for the past few decades not only helped develop technical knowhow, high project management skills, advanced technologies, best practice methods but also ways of managing expediciencies including cost and risk control mechanisms. "In terms of technology, we have learnt from Japan and Germany and have combined lessons." For example, they are building new berths in the Dar es Salaam port while the port is still operational which means that construction equipment and container vessels in transit are sharing space. China is therefore exporting an ecosystem of 'efficiency-innovation' through its infrastructure projects in Africa. Similarly, their familiarity of operating in African markets was also listed as a huge advantage, with several projects

However, it is their access to substantial funds and tacit support from the government that makes the Chinese approach unique. In the case of the Zanzibar airport, for instance, the Chinese contractor was financing the project after China EXIM cancelled the loans, "working on good faith, although money hasn't come through". African officials also pointed out that during this time, members of CCP had visited project sites and assured its completion. These statements illustrate that Chinese SOEs spearheading projects in Africa are supported by implicit guarantees of the Chinese state with the aim of achieving economies of scale in infrastructure development. This corroborates the inference made in Chapter 2 that China's strategy vis-a-vis infrastructure development in Africa is to 'construct for constructions' sake' in a bid to derive new, external sources of accumulation.

Several Chinese managers also alluded to the fact that their primary concerns were accruing long term profits and building 'brand China'. For instance, regarding the construction of berth 1 (13700 m) in the Dar es Salaam port, a manager pointed out: "everyone said at the beginning that because the berths are so large, we will not be able to complete on time. But we are putting in additional resources,

and working overtime to make sure that it is done within the agreed time.” This insistence was attributed to the fact that one successful project would ensure many more in the future but also to the aspiration that Chinese builders were seen to be at par with other international players. To put it in the lexicon of business, the strategy of China's state-owned construction companies is to capture the infrastructure development market in Africa. China's ability to do so arises from a number of sources. Lack of transparency in procurement procedures means that some Chinese construction companies are, to an extent, benefiting from China's excess capacity in raw materials.

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In a similar vein, it was also interesting to note that Chinese companies are attempting to use Chinese standards across the board but African governments still prefer US or UK standards. Chinese contractors working on World Bank funding had to adhere to British standards which put in place many more requirements than the EXIM bank, and naturally increased costs. For instance, the major difference of working on a China Exim project and a World Bank funded project, as explained by two project managers were: hiring more technical staff, more inspections and checking, centrality of environmental, health, safety, quality management, providing excellent working conditions for employees, provide training, building changing rooms/ canteens/ restroom, giving away free condoms and raising awareness on HIV AIDS prevention among others. They confirmed that these high requirements also meant that the output was of a superior quality. In other domains, Chinese standards have had better luck. In the case of the NICTBB, the construction is such that only

Huawei routers are compatible, with no room for substitution (Vota 2011). This ensures that Huawei will continue to receive maintenance contracts in the future and that it will also be a natural choice whenever expansion of the backbone is contemplated.

To the question whether infrastructure development will impact growth as expected is a different matter. In terms of pure correlation, China's construction revenues are negatively associated with manufacturing value added. There is uncertainty about whether African countries possess the requisite absorptive capacities to generate revenue and growth from the infrastructure being built. Moreover, it could be detrimental to industrialisation as it is biased towards natural resource trade - construction revenue data does display a persistent concentration in resource rich parts of Africa. While construction proves immediately beneficial to certain stakeholders such as workers and landowners, the same cannot be said with certainty in a long-run general equilibrium sense. Put simply, debt-driven construction can have long-run negative effects that appear to be less meticulously accounted for by stakeholders.

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Regarding the challenges of operating in Africa, the lack of a skilled workforce was mentioned several times. Chinese managers said that they resorted to bringing managers from China as relevant skills were unavailable in Tanzania or Kenya. However, Tanzanian

engineers interviewed argued that a lot of the mid management work carried on by the Chinese can be given to local workers but were not. A Chinese manager working in Tanzania justified using Chinese labour by complaining that local daily wage workers disappear after getting pay. “Some were trained in ‘coating of pipes’ for 2 months but disappeared afterwards. This hinders continuous work...It would save budget to hire locally, but they become difficult to manage”.

Chinese managers said that there was significant difference in operating in China and Africa. In China workdays are 7 days/week, 8 hour days, sometimes overtime. “In African countries, the pace of work is much more relaxed”. One manager complained that “the lunch hours are so long” because of which “in China, in one month we can build 2-3 floors, but in Kenya not even one floor.” He added, “We don’t take holidays” to underline the significant difference in approach. This however, cannot be generalised. In another instance a Chinese company, Winds Co. Mazawa that manufactures sportswear for US markets moved base from Dar es Salaam to Morogoro because they found the workers there- primarily farmers - more used to long working hours and hard work than the “lazy city boys” of Dar. They now have to move products put together in Morogoro - a town outside Dar - to the Dar port - which entails extra costs but they are still not willing to move back to Dar.

Both Chinese and African interviewees said that there was a certain degree of misunderstanding, lack of communication, and lack of cultural assimilation. This cultural apathy is evident in construction sites littered with Chinese slogans and in newly constructed tunnels and bridges which have Chinese characters exclaiming the friendship between the two countries but nothing in Swahili or other local languages.

The debt trap narrative, in contrast, does not hold much water. While large infrastructure projects being funded by China are contributing

to increased levels of debt, none of the cases observed were considered at the risk of being handed over to Chinese banks in a debt-equity swap. The attitude towards mounting levels of debt is that they can grow their way out of it. This implies one of two things. It could mean that Africa’s outlook on economic development bears key similarities to China’s, minimising the transaction costs of collaboration on lending-driven infrastructure construction. Alternatively, it could indicate China’s success in stamping the Chinese development model as fit for replication by other developing countries.

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Photo: Xinhua, 2019

Either way, it would appear that Kenya and Tanzania are comfortable opting for debt-driven economic growth, given the cost-efficiency that is attendant with dealing with China. “Debts are good. Debts are crucial for a country to grow. The problem is the mismanagement of debt”, one official explained. However, there are also sections that are wary of mounting debt. Some officials admitted that for certain projects “If debt is defaulted, China Exim has step in rights.” According to an official in Dar es Salaam, “If you don’t structure your finances, of course there are consequences of China’s infrastructure diplomacy”.

Chinese contractors also pointed out that they are often portrayed negatively by local and western media. According to one manager “media misleads citizens with negative news”. Managers of SOE’s admit that there was pressure to report back to party every time a negative news story was published. To counter the flurry of negativity, SOE’s were recently given permissions to open social media accounts so they could put out their own narratives.

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The perception of the Chinese in Africa are multiple and layered. “Officials and the locals in Kenya have a different view of China, something needs to be done about the negativity surrounding the Chinese”, said one official in Nairobi. “Perhaps the Chinese embassy in Kenya could do more”, he added. While the leaders seem excited about the potential of China as a developmental partner, “locals have a lot of complaints about the Chinese, if the issue is not addressed holistically, it could lead to resentment,” another official explained. With increasing investments in Africa, China’s Policy of Non-interference is also changing. As Prof. Shikwati mentioned “They are already interfering by just being here.”

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POLICY PERSPECTIVES

African engagement with Beijing has the potential to play a major role in continued development where infrastructure can have direct and indirect spillover effects on revenue, incomes, and livelihood. FOCAC VI’s Action plan has been considered a “new deal for Africa” which offers an opportunity to realise key aspects of United Nation’s Sustainable Development Goals of Agenda 2030 and Agenda 2063. China has been one of the first countries to undertake a voluntary national review of its commitment to meet the SDG targets especially in supporting lesser developed countries. Meanwhile, Africa is the only region that has devised a full document in representing a united African voice in embracing the SDGs which is evident in the great degree of convergence embodied in the continent’s priorities through the African Union’s 2063 Agenda (African Union). Beijing hopes through its overlapping interests in pursuing SDGs and FOCAC, it can actively play a part in African development and promote Africa in forums like the G20 to accelerate industrialisation of Africa (Alden, Oxfam Report, 2017, 16). This will also serve China’s national interest in the continent.

Beyond FOCAC’s potential promise, the natural complexities of agenda 2063 reveal areas of friction when evaluating Beijing’s new deal for Africa’s development aspiration. Firstly, Chinese project-based approach to development implies that initiatives are measured by delivery instead of the conditions the project is managing (Alden, Oxfam Report, 2017, 29). For instance, China infrastructure loans are tied to procurement, design and building which leaves insignificant space for local suppliers in Africa in the entire project supply chain. Development, as exported from China to Africa, is measured by the output and completion, with little attention paid to cost and sustainability. So the universality of the SDGs within the 2063 agenda calls for rethinking of methodologies, and integration of global indicators to improve monitoring and evaluating progress in financing for development.

Secondly, when considering development financing, attention needs to be paid to the financial provision since currently there are more concessional loans and export credits tied to Chinese production factors in return for infrastructure projects. At the same time, African Union convened meetings regarding Chinese financing and concluded “that structural reform was necessary to achieve the SDGs and Agenda 2063” illustrating the fact that African institutions at regional, national and sub-national level are under capacity to manage fiscal resources. It is not just indicators to measure programs output, but the ability to absorb financing of programs, and skill transfers are areas of concern that African states need to give serious attention moving forward.

Thirdly, there is a limited merging of SDG 5 and FOCAC VI regarding women and girls which ignores the positive role women play in contributing economic growth in developing countries of Africa. From our field visits in Tanzania and Kenya, we observe that women involvements was limited.

Lastly, considerable attention needs to be allotted to ensure the mobilisation of all three primary platforms of African governance including the national governments, the regional economic communities and the continental, regional organisation when engaging with FOCAC related development to implement agenda 2063 and SDGs. Here African Union can play an important role to invoke African states agency in coordinating the process and foster negotiations. However, that willingness of African agencies to agree and cooperate is an area where the African leaders need to re-think. These friction points create an opportunity for Africa to own a global process where Africa’s merging partnership with China enhances the ownership process as it moves away from the traditional North-South axis. A breakthrough in these frictional spaces will require Africa alongside its global development partners to cultivate agency for the long-haul of the development course.

Using a perspective that invokes agency within African-Chinese relationship showcases Africa’s potential to own their course of development and play an influential role in the international community. Building on the study of international economic relations, shifting pivots in China’s changing historical interests in Africa, and the current political global climate, we have demonstrated potential spaces for African states to actively pursue their vision of improving governance as embodied in the 2063 Agenda. Those studying Africa and involved in Africa’s development should not overlook the fact that African agency is as real as the challenges ahead in realising Agenda 2063 and China’s engagement in Africa.

RECOMMENDATIONS FOR INDIAN ACTORS

Considering that India is re-engaging countries in the continent and is positioning itself as a viable partner to African governments, there are some specific areas where it can contribute tremendously. During the course of this study, it became clear that several African stakeholders did not have the necessary competence to see through mega projects from the start to the finish. They often lacked the skills needed for project management and supervision. For eg. contract management and contract structuring as well as negotiating terms were pointed out as areas that needed to be strengthened. According to one official “It has been very difficult negotiating with the Chinese, there is an issue of transparency - they say one thing to us and mean something else - there is also a significant gap in cultural values”. It was also stressed that African governments found it difficult to ‘assess long term impact’ due to lack of exposure and managerial capability. In several projects, African governments had hired German, French or other Western consultants to work with Chinese technicians. There is a substantive role India can play in helping boost African capacities in this particular area.

This support could also extend to training in contract management, legal aid and

negotiation strategies and skills training. According to a Kenyan government official "Chinese companies financial models can be unrealistic," - they execute fast but need to know termination clause, condition precedent, condition consequence. "Because we didn't have the experience of negotiating with the Chinese, we hired a lawyer from Singapore," the official added.

For example, although several African officials said that 'technical training' was made a vital component of contract- in a bid to offset the high levels of skills gap- Chinese contractors insisted that training is given to someone who is already familiar with equipment, to help them in specific aspects of machines but will not provide general training. In another instance, Tanzanian engineers argued that "there is tension among workers - to involve more locals in managerial positions and skilled work, but the problem is that although contract said that they will employ locals, it did not specify in what capacity." Given that India already has in place multiple frameworks of cooperation and emphasises capacity building as one of the pillars of India-Africa engagement, New Delhi could provide assistance and training to African officials in the process of initiating, planning and executing projects.

Regarding Indian companies cooperating or competing with Chinese actors, according to a Kenyan academic "India and China have comparative advantages- there is no need to compete and can find ways of working together". Interestingly, there seems to be cooperation already underway in certain areas. Chinese private construction companies, for instance, sub-contract parts of their projects to Indian companies. They import machinery from India, prefer TATA tipper lorries calling them cost efficient, durable and locally available. However, there are some more tangible ways in which Indian actors can utilise their strengths. Some of them include:

- India's service sector companies can tap into opportunities that arise from increased infrastructure development in Africa. African stakeholders in need of legal services (contract negotiation), financial management services and technical training, in particular, as per the cases studied.
- Given that India possesses significant capabilities in fibre optic manufacturing, exports to Africa should be incentivised. India's Telecom Equipment and Services Export Promotion Council (TEPC) has recommended GST credits as a means of incentivising the sector (Telecom Regulatory Authority of India 2018). China's construction in Africa's telecom sector such as the NICTBB will create these opportunities.
- Tax incentives for Indian diaspora in Africa that run businesses registered in India with offices and factories in Africa. This group should be incentivised to train African labourers as well, since they are best placed to do so.
- Relax the extent to which LoCs are tied to Indian contractors. Cooperation with Japanese contractors should be explored. India and Japan are already talking of cooperation in Africa at the diplomatic level. This should translate on the ground between companies.
- Examine in greater detail, China's efficiency innovations and supply chain management in Africa, in order to lower construction costs. Isolate and imitate methods that do not accrue from state support or deep pockets.
- Expand cooperation with regional blocs. Construction that serves regions as a whole will enjoy economies of scale and, to some extent, will offset India's high capital costs and other inefficiencies.

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PROFILE OF RESEARCH TEAM



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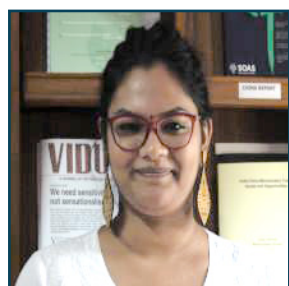
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Photo: Event hosted by ICS & NMML to disseminate preliminary findings, April 2019

ABOUT ICS



The Institute of Chinese Studies (ICS) has its origin in the China Study Group, which began its activities in 1969. In 2010, the ICS took on an independent existence with MEA support as a research think-tank on China and East Asia. It conducts programmes on China's economy, politics, border studies, comparative development studies and relations with China and East Asia. It trains and connects scholars, provides policy inputs, and works with academic community and policy-makers. With strong collaborations in China, Taiwan, Vietnam, the US, and Russia, it organises conferences, delegations, and scholar exchanges. Its publications range from the prestigious journal China Report and issue briefs to academic papers and an active social media outreach. Currently, ICS is the only multi-disciplinary think-tank in India for the study of China from a uniquely Indian angle.

Ambassador Ashok K. Kantha, who was Ambassador of India to China until January 2016 and had served earlier as Secretary (East), MEA and High Commissioner to Sri Lanka and Malaysia, is Director of ICS since April 2017. Its Governing Council is chaired by Prof. Patricia Uberoi, and its Advisory Board by Ambassador Shivshankar Menon, former National Security Advisor, Foreign Secretary and Ambassador to China.

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The Institute of Chinese Studies, Delhi, is one of the oldest research institutions on China and East Asia in India. The ICS seeks to promote interdisciplinary study and research on China and the rest of East Asia with a focus on expertise in China's domestic politics, international relations, economy, history, health, education, border studies, language and culture, and on India-China comparative studies. It also looks to fostering active links with business, media, government and non-governmental organizations in India through applied research, executive training programmes, and seminars and conferences, and to serve as a repository of knowledge and data grounded in first-hand research on Chinese politics, economy, international relations, society and culture.



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