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Africa's environmental implications of China's Belt and Road Initiative

In recent years, China has taken big steps in terms of African wildlife conservation, including raising the issue within international fora such as FOCAC (Forum on China-Africa Cooperation) and imposing a domestic ivory ban in 2017. Despite these laudable measures, there is still much room for improvement. One pressing issue which tends to be overlooked is the large-scale impact of African infrastructure corridors, many of which involve Chinese financing and implementation. A growing body of scientific literature highlights how the development of linear infrastructure projects, such as road and rail construction, contribute toward long-term ecological fragmentation. This phenomenon, in which in-tact ecosystems are increasingly broken into smaller parts, poses a far greater environmental threat than the immediate impact of road and rail construction. Additionally, unlike the immediate impacts of construction, deferred impacts are far harder to measure in advance.

Background

It is widely acknowledged that infrastructure plays a crucial role in economic development. Infrastructure promises to integrate remote and marginal regions into global markets. Such connectivity enables greater trade relations between commercial centers and their underdeveloped counterparts which, in turn, allows for greater economic growth in peripheral regions and a rise in education, clean water, health care and labour mobility.

Within sub-Saharan Africa, in which 40 per cent of the population dwells in landlocked countries, linear infrastructure promises to link remote hinterland economies to global market centers. Geographical remoteness, coupled with indirect and poor quality transport linkages result in higher transport costs, and longer time-delays, which hampers both internal and inter-regional transport. Costs for trade in sub-Saharan Africa are estimated at more than three times that of the Middle East and North Africa and twice the costs in East and South Asia. Additionally, infrastructure has potential effects on income inequality, insofar as the assets of the poor (such as land they hold, or human capital), rise in value when they are more efficiently linked up to commercial centres. This is particularly evident in the rehabilitation of rural roads, which can lead to

rises in agricultural wages, increases in aggregate crop indices, growth in the non-agricultural sector, an increased availability of food and higher school completion rates. Other forms of infrastructure, such as household electrification, have a significant impact on employment, as seen, for example, within South African rural labour markets.

The urgent need for infrastructural development in much of the developing world dovetails in many respects with China's domestic economy. 30 years of intense infrastructural development within China has led to growing saturation, leading to many SOEs (State Owned Enterprises) to seek business abroad. These expertise, coupled with China's well-endowed policy banks, such as Exim Bank and China Development Bank, have made China an attractive development partner for many countries in the Global South. This mutual situation serves as a cornerstone of China's 'Belt and Road Initiative', a vast plan to provide connective infrastructure across much of the developing world. At present within Africa, there are over 30 transport mega corridors being planned or already in development, which span some 53,000km in length. Chinese companies and financial institutions are playing an instrumental role in many of these developments. Some are highly ambitious in scope, such as the [Great Equatorial Land Bridge](#), which envisions road, rail

and oil connectivity stretching from Lamu, on the coast of Kenya, all the way to Douala on the Cameroon coast.

China's domestic drivers

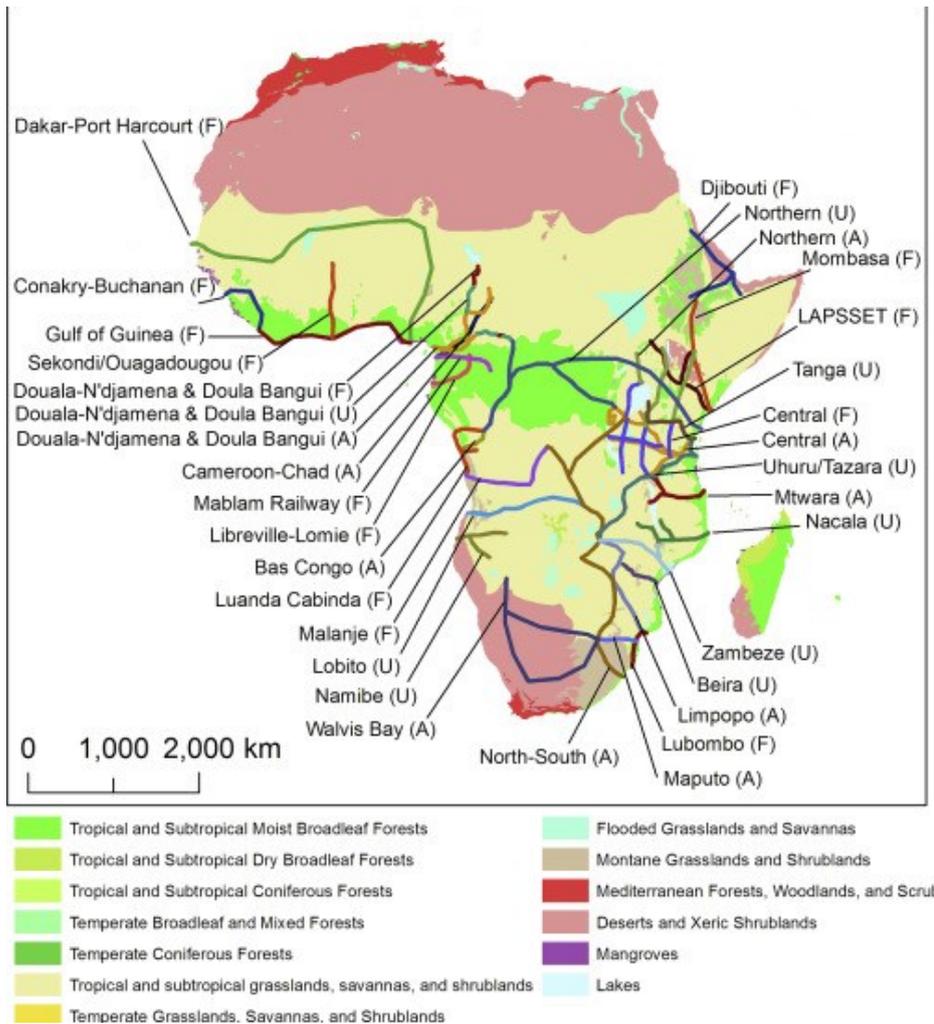
While claims that the underlying principle of the Belt and Road Initiative is a shared vision by developing world countries to increase prosperity, China's domestic economic and environmental concerns are also driving the process. As China's construction sector becomes increasingly saturated at home, it has become of growing importance for infrastructure companies to secure work abroad. Thus, many SOEs, with assistance from the state, now actively seek out projects in the developing world through mechanisms such as the Belt and Road Initiative. Additionally, China's excess capacity in terms of sectors such as steel, cement and electrolytic aluminium, strategically dovetail with its infrastructure drive abroad, insofar as infrastructure requires large quantities of such materials. Furthermore, China's

recent environmental turn domestically, which has seen, for instance, the shutting down of polluting factories (in 2017, China punished an estimated 18,000 companies for polluting offences), has led to an increase in the outsourcing of polluting technologies to other parts of the world. For instance, according to the [Climate Policy Initiative](#) estimates, in the decade between 2005-2015, US\$ 21-38 billion worth of Chinese finance went to overseas coal power projects. Thus, while on the one hand, China's assistance offers the promise of development in many part of the global south, on the other hand, such initiatives stem, at least in part, from domestic limits which China currently faces both in its economic and environmental spheres.

Research on the environmental impact of countries undergoing industrialisation point to the fact that such countries generally start from a base of low environmental impact and then, as they industrialise, move to a stage of high environmental impact. However, as wages rise and a growing middle class emerge,

increased pressure exists on governments by populations to mitigate such environmental degradation. Known as the environmental [Kuznet's curve](#) – an upside down U shape on a graph – in which environmental effects increase, plateau and then decrease, it is possible that China is currently reaching the plateau stage. While technology is one way in which developed world countries increasingly mitigate the damage, another is the outsourcing of polluting industries, something which, for instance, the Euro-American sphere carried out when it shifted a large swath of its low-end industrial base to Asia – and China in particular - from the 1980s onward. In the second decade of the 21st century, we now see China itself reaching a similar situation, insofar as growing environmental concerns have emerged in tandem with calls within China to shift its low-end industrial base offshore to regions such as South East Asia, Africa and elsewhere.

Diagram 1: African infrastructure projects, planned and underway, and the ecological biomes through which they run



Source: Laurance, et al., 2015

including commercial agricultural interests, small scale farmers seeking newly accessible farming or grazing, as well as attracting environmentally threatening industries such as the mining and energy sectors. This can be seen, for instance, in the development of Kenya's LAPSSET project in the isolated, and ecologically intact region of Lamu. Shortly following the port development, it was announced that a US\$ 1.9 Billion coal powered station was to be built adjacent to the port, which includes both Chinese implementation and financing (as well as additional investments from South African, Kenyan and Gulf companies). The decision has left the local community, heavily dependent on fishing, gravely concerned about the future sustainability of their livelihood.

Another issue with creating roads into hitherto under-developed regions is the phenomenon of deferred-impacts. Unlike direct impacts, which are measured by the actual interference a project will cause (such as clearing vegetation in order to build a road), deferred impacts refer to long term ecological transformations which roads and railways facilitate. For instance, over time, primary roads frequently lead to secondary and tertiary roads and attendant agricultural expansion, extractive activities and new urban centres. As these developments transpire, they divide in-tact ecosystems, in which large, continuous habitats are broken up into smaller, more isolated remnants. Over time, this process leads to decline in species population density and species richness, as well as changes in species composition and interaction, and a reduction in population persistence.

One country where the link between new roads and ecological fragmentation is apparent is in China itself. Within the South Western region of China, home to large swathes of China's remaining biodiversity, the past 30 years of infrastructure development have led to significant habitat fragmentation. Studies focusing on the provinces of Yunnan and Sichuan which draw on satellite photography over decades, draw convincing conclusions regarding the construction of roads and accelerated habitat fragmentation. Such fragmentation is very much a product of China's break-neck pace of development over the past 30 years, in which economic growth held precedent over environmental concerns – an approach which has been scaled back in recent years, as the Chinese leadership has become increasingly aware of unsustainability of such an approach. In many respects, a significant number of developing world countries, many of which are in Africa, are in a similar position today as China was three decades ago, insofar as growing demands on governments to increase economic prosperity call for greater infrastructure investments. At the same time, the lack of infrastructure also contributes to the fact that many of these countries still have relatively in-tact biodiversity networks. How to engage in economically productive infrastructure

Box 1: The LAPSSET construction project: Lamu

Lamu county, a major site of the LAPSSET construction project, consists of an island archipelago and swathe of mainland which stretches 100 km up to the coastal border with Somalia. Lamu's highly productive mangrove and coral ecosystems, providing an abundance of marine life, are a major basis of livelihoods in the region. Tourism is an important part of the economy, with Lamu town listed as a UNESCO world heritage site. LAPSSET is essentially a national and regional project which has existed as an idea since the mid-1970s. While still in its infancy, upon completion the estimated US\$ 24 billion dollar project envisions a 32 berth port at Lamu, with inter-regional highway, railway and oil pipeline (both crude and product lines) connections extending from Lamu to the neighbouring capitals of Juba and Addis Ababa.

Additional features include three international airports (at Lamu, Isiolo and Lake Turkana) each accompanied by resort cities. Port Construction is being carried out by China Communications Construction Company (CCCC), which includes land reclamation and dredging (to a docking depth of 17.5 meters). At present, CCCC is constructing the first three berths of the Lamu port, although the funding comes directly from the Government of Kenya (China's Exim Bank declined to offer funding for the project due to security concerns). In tandem with the port is the construction of the Lamu coal power station, said to be the largest in East Africa, which is currently being developed 21 km North of Lamu Town. Consisting of a consortium of Kenyan (Gulf Energy; Centrum investments) and Chinese companies (Sichuan Electric Power Design and Consulting, a subsidiary of Power China; China Huadian Corporation Power Operation Company, the Sichuan No. 3 Power Construction Company), the station is projected to cost US\$ 1.9 billion.

projects while at the same time minimizing impacts on biodiversity?

In 2015, a paper by [Laurence et al.](#), analyses 33 mega transport corridors planned, or in development, across Africa, in terms of biodiversity impact, with the authors concluding that they would affect an immediate 400 conservation areas (and 1,800 conservation areas indirectly). The most promising of these corridors, are those which have the potential to enable large-scale agricultural benefits while having limited ecological effects. Conversely, those with little capacity to enable substantial agricultural development but with high environmental impacts are the least desirable. Based on these criteria, the authors argue that the most inadvisable of these corridors include the M'Balam Railway (Cameroon), and the Libreville-Lomie (Gabon-Cameroon) corridors; only six of the 33 corridors are, within this environmental context, proposed as 'promising'.

Chinese and African agency

While China is eager to finance and construct many of these projects, a significant amount of agency should be laid at the feet of African governments themselves. Within many parts of Africa, large scale infrastructure projects offer a way for leaders to cement their political legacies. Additionally, given the poor state of infrastructure, for many African states, such initiatives can also assume populist appeal. Infrastructure also offers opportunities for nation-building insofar as it has the potential to connect remote regions, sometimes comprising of ethnic groups which pose resistance to government rule. While many of the countries in question have sound environmental laws, issues around implementation of such laws and high levels of corruption compromise what appears to be sound policy.

The other side of the coin comprises the donors willing to fund such projects, which include a host of multi-national actors, of which China is a crucial component. China has launched an ['Ecological and Environmental Co-operation Plan'](#) to accompany the Belt and Road initiative, which includes an emphasis on eco-friendly infrastructure implementation, the building up of environmental platforms for ecological protection, encouraging enterprises to play a role in environmental governance and forwarding Green supply chain management. To what degree this document will be actualised in practice, remains to be seen. If the principles of the plan are to be adhered to, it may entail both Chinese corporations and the state more broadly, declining financial and technical assistance to projects which pose great environmental risks – a move which will have financial implications for Chinese companies and perhaps even implications for its 'non-interference' policy. Nevertheless, if such moves occur, they will signal the seriousness with which China takes the environmental dimensions of its Belt and Road Initiative.

Recommendations

- ◆ Given that Africa is on the verge of large scale infrastructure transformation, the deferred ecological impacts of roads, railways and ports need to become more deeply engrained in policy discussions, as well as in the planning and implementation of projects.
- ◆ African governments need to work closely with environmental stakeholders to determine infrastructure projects which have the greatest impact on development and the lowest impact on biodiversity. As many African infrastructure corridors are still in the planning stage, there remains room for reconceptualization.

- ◆ China needs to become more discerning in terms of the projects it offers technical and financial assistance to. This may include drawing on evidence from their own infrastructural developments in ecologically sensitive areas of China over the past few decades, as well as being more hands-on in terms of Environmental Impact Assessments within host countries.

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