

Policy Brief

Highway to the Forest?

The Siting and Environmental Impacts of Chinese Government-Funded Road Building in Cambodia

August 2022

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The complete details of this research are available in AidData [Working Paper #114](#).¹

Overview

Over the last two decades, the People's Republic of China (hereinafter "China") has provided record amounts of international development finance and established itself as a financier of first resort for many low- and middle-income countries. China's international development finance commitments now average \$85 billion annually, roughly double those of the U.S. Much of this spending has focused on building the "hardware" of economic development, including highways, railroads, dams, bridges, ports, and electricity grids. As Western aid agencies and multilateral development banks have become significantly more risk-averse about bankrolling large infrastructure projects due to their environmental and social risks, China has stepped into the breach and parlayed the challenge of a global infrastructure financing gap into an opportunity to establish itself as a go-to infrastructure supplier and financier.

Yet very little is known about the environmental risks posed by the projects that China has financed. Scholars, environmental activists, and journalists have raised concerns about the nature, pace, and scale of China's development finance activities and the

¹ Baehr, C., BenYishay, A., Parks, B. (2022). "Environmental Impacts of Chinese Government-Funded Infrastructure Projects: Evidence from Road Building in Cambodia." Working Paper #114. Williamsburg, VA: AidData at William & Mary.

potential for unintended environmental consequences. Many have questioned whether China is sufficiently prudent in its design and implementation of large-scale infrastructure projects. There is particular concern about the *siting* of projects funded by the Chinese government, particularly those that facilitate legal and illegal logging, agricultural frontier expansion, and human settlements in previously remote or pristine areas.

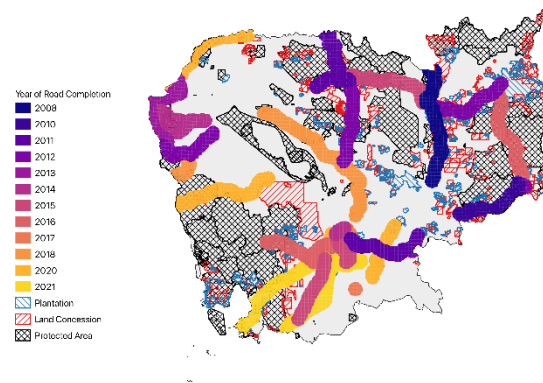
We study the siting and impacts of Chinese government-funded road improvements in Cambodia, where over the past two decades China's state-owned banks have supplied more than \$4 billion for 30 projects building, rehabilitating or upgrading over 3,000 km of major roadways. Cambodia's forests contain some of the most biologically diverse habitats in the world, and have experienced dramatic deforestation over the past two decades.

New Data on Chinese Government-Financed Road Projects

We generated and subnationally geo-referenced a dataset of Chinese government-financed road projects in Cambodia between 2003 and 2021. We collected information on Chinese government-funded activities using the "Tracking Underreported Financial Flows" (TUFF) and used extensively for a wide array of analyses. We relied primarily on the aid and debt information management system of the Cambodian government, press releases from the Chinese Embassy in Cambodia and Chinese contractors working in Cambodia, and online news media, which yielded information on the timing and location of 30 road construction and improvement projects.

We then geo-referenced the road projects using AidData's Geocoding Methodology Version 2.0.2. For each project, we identified the end points of road construction, and then combined satellite imagery and a national road map from the Cambodian Ministry of Public Works and Transport to identify the path of each road between its end points.

The resulting road network data is shown on the right, along with the extent of plantations, land concessions, and protected areas designated by the Government of Cambodia. This road network data is now publicly accessible at no cost at ...



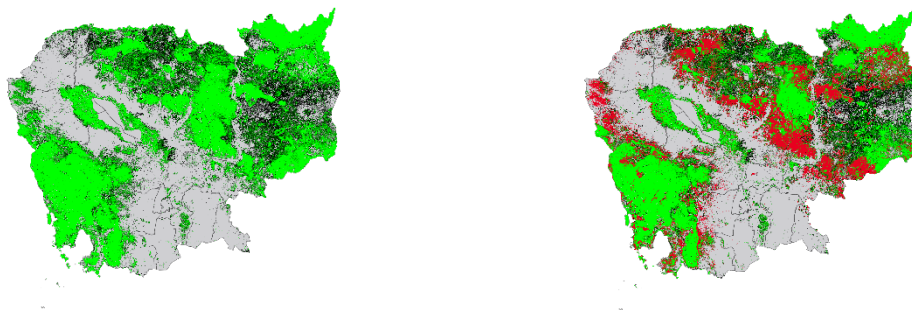
The Siting of Road Investments: Comparing Funders

We first use the new road network data to show that Chinese government funding for roads projects are disproportionately targeted to provinces with more plantations and concessions, and are focused on extraction of forest resources. Indeed, two-thirds of the Chinese government's road funding (\$2.78 billion in 2017 USD) was concentrated in northeastern and southwestern Cambodia, areas of the country that had especially high levels of forest cover density at baseline and deforestation during our study period. The country's plantations and concession areas, which are heavily concentrated in these provinces and dominated by Chinese investors, experienced particularly high levels of forest cover loss. The newly built roads serve as important transit routes for exports from these regions.

We use regression analysis to compare these investments with funding provided to the Cambodian transport sector by the World Bank over a similar timeframe (1995-2014), previously geo-referenced by AidData. We find that while Chinese government funding flows differentially to more forested provinces and those with plantations or concessions, World Bank funding does not.

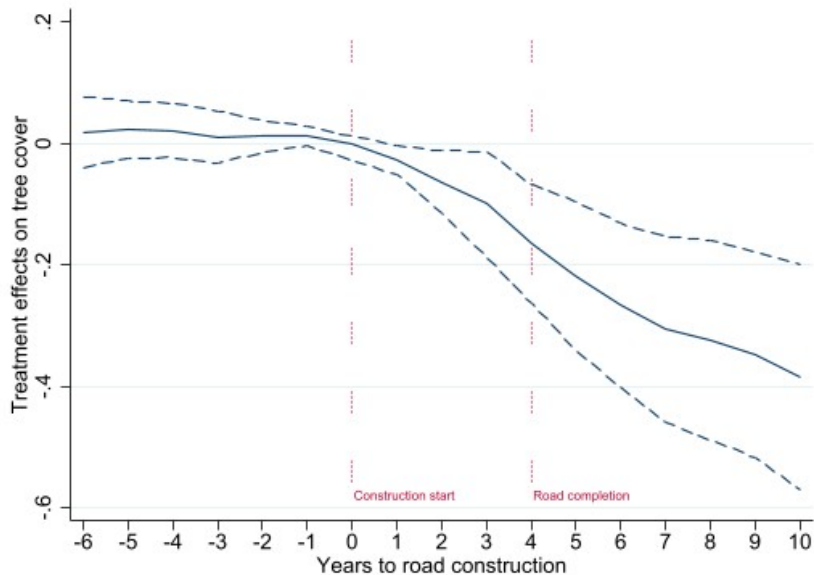
Impacts of Chinese Government-Funded Road Investments on Forests

We merge the road network data with two decades of satellite data on forest cover. The figures below show the extent of forest loss observable using this satellite imagery (nearly 30% of Cambodia's forests were lost between 2000-2019).



To assess the specific causal impacts of the Chinese-funded road investments on forests, we construct comparison groups using the variation in the sequence of these

investments over time and across different road segments. At each point in time, we compare locations near the improved roads to other locations near roads that will be but are not yet improved. This allows us to account for many potentially confounding factors. We find that the road investments led to large declines in forest cover, particularly in nearby plantations, where more than half of tree cover was lost. As the figure below shows, most of this decline occurs *after* the road construction period is over, and is most concentrated in plantations and concessions.



Much of the deforestation occurs on rubber plantations, driven by the lower time and cost needed to reach export markets once the roads are complete. In fact, the road construction makes even marginal rubber plantations more commercially viable, speeding forest conversion to plantation most in years when global rubber prices are at their lowest (and when this conversion would otherwise be unprofitable).

Conclusions and Policy Recommendations

We draw several primary:

1. By financing new road construction in Cambodia's northeast---through critical tracts of sensitive tropical rainforests---China has diverged from the geographical and environmental targeting practices of other donors and lenders.
2. These road investments lead to major forest losses. These occur largely after road construction is complete and are not limited to the immediate road corridors.

3. We find forest impacts even in the latter part of our study period, when Environmental Impact Assessments (EIAs) and other protective measures were already in place.
4. The impacts of Chinese government-financed infrastructure are due in large part to the geographical targeting of infrastructure near or within sensitive forest ecosystems. In other words, even if the construction impacts for project funded by the Chinese government and other donors were identical, the primary roads improved with Chinese government funding have likely led to greater forest loss due to their differential proximity to plantations and concessions.

We offer several policy recommendations to mitigate the environmental harms due to infrastructure investments:

- Greater support for enforcement of EIAs in the review and approval of infrastructure by host governments (such as the Government of Cambodia), with a particular focus on the siting of roads near standing forests and extractive land designations
- Recent shifts by the United States and European Union toward more financing of international "green" infrastructure, need to be coupled with more---not less---coordination with Chinese government funders. Improved coordination could result in Chinese state-owned banks moving away from financing major transport infrastructure in sensitive ecosystems.