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Improve energy-efficient construction in China

In the past few decades, China’s construction industry has undergone a swift expansion, increasing its energy use and carbon emissions (1). In an effort to meet climate goals (2), China has formulated guidelines to minimize carbon emissions in new development (3). However, the construction industry lacks effective regulatory standards and assessments to ensure energy efficiency.

When inspecting the carbon impact of construction, the Chinese government primarily refers to the Green Building Evaluation Standard and the Technical Guidelines for Energy Efficiency Evaluation and Labeling of Civil Buildings, which comprehensively assess variables such as resource management, land planning, and building features (such as air conditioning units, light and sound impacts, and green spaces) (4, 5). However, these standards rely on outdated baselines. For instance, the 2022 Beijing Winter Olympics have been hailed as the first Olympics in history to achieve carbon neutrality (6), but the construction of the Olympic venues adhered to 2014 regulations for green buildings (7). Since 2014, carbon mitigation strategies have improved, and lower emission options could have been used for energy systems, construction materials, and operational strategies (8, 9).

The current standards also lack a framework for monitoring and appraising the carbon footprint throughout the entire life-cycle of buildings. The impact of new infrastructure includes not only design and construction but also the emissions produced while it is in use—in some cases spanning decades—and its demolition and disposal (10). Many projects in China now claim to qualify as “low-carbon construction” (11) (a more efficient classification than “green construction”) by citing energy-saving technologies used during limited stages, such as construction or operation. To accurately classify projects as low carbon emitters, China needs a comprehensive evaluation system.

To maximize the use of low-carbon construction equipment, materials, and methods, the central government should standardize the design and construction of energy-efficient buildings. Local governments and relevant agencies should rigorously review project applications, strengthen construction quality monitoring, and increase the frequency of spot checks during the building operation phase. Finally, an evaluation system that determines the carbon emissions over the entire lifespan of new infrastructure, similar to the US Evaluation System for Zero Net Carbon Building Performance (12), should inform development decisions.

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REFERENCES AND NOTES
1. “Report: China’s urban building carbon emissions show a decreasing distribution from north to south and from east to west,” Guangming Net (2023); https://mgmw.cn/baijia/2023-01/05/13032244808.html [in Chinese].
6. “Beijing 2022 Winter Olympics has become the first ‘carbon neutral’ Winter Olympics to date,” CCTV (2022); https://news.cctv.com/2022/02/18/ARTIz5cK5eRcjfbD7xS60218.shtml [in Chinese].
this commitment, the Chilean government is pushing for the construction of a road that would cross the Alerce Costero National Park (1), an area of global importance for biodiversity conservation (2) and home to the endangered conifer Fitzroya cupressoides (3). Throughout the world, roads threaten biodiversity and ecosystem functions (4). Before pushing this project ahead, Chile should consider the likelihood that the road will undermine the country’s progress toward international environmental commitments.

Fitzroya, which grows exclusively in Chile and Argentina, is one of the longest-living tree species on Earth (5, 6). Fitzroya forests are among the forests that sequester the most carbon worldwide, and they provide critical ecosystem services and a wealth of historical and environmental information (7). Fitzroya populations face a high risk of extinction after centuries of overexploitation and burning (7) and, more recently, as a result of climate change (3).

The Alerce Costero National Park is the only area that protects a genetically unique Fitzroya population and the last remnants of species-rich Valdivian temperate rainforests from the Coastal range (8, 9). Building a road through this vulnerable ecosystem would increase the risk of invasion by alien species, facilitate illegal logging, and greatly increase the probability of extensive wildfires in the park (4). More than 90% of wildfires occur within 1 km of roads in Chile (10).

Chile’s proposed road completely ignores the COP15 agreement. The government must honor its commitments and prioritize the protection of the country’s most endangered species. The global biodiversity crisis and the unprecedented high risk of species extinction (11) call for timely and concrete action. The preservation of roadless areas is critical to the goals of reducing extinction risks and protecting 30% of the planet.

Response to Comment on “Policy impacts of statistical uncertainty and privacy”
Ryan Steed et al. propose a valuable improvement to our method of estimating lost entitlements due to data error. Because we don’t have access to the unknown, “true” number of children in poverty, our paper simulates data error by drawing counterfactual estimates from a normal distribution around the official, published poverty estimates, which we use to calculate lost entitlements relative to the official allocation of funds. But, if we make the more realistic assumption that the published estimates are themselves normally distributed around the “true” number of children in poverty, Cui et al.’s proposed framework allows us to reliably estimate lost entitlements relative to the unknown, ideal allocation of funds—what districts would have received if we knew the “true” number of children in poverty.

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REFERENCES AND NOTES
Researchers need better access to US Census data
Cory McCartan, Tyler Simko, and Kosuke Imai

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