

Science support for Belt and Road

Last month, at the Second Belt and Road Forum for International Cooperation in Beijing, President Xi Jinping gave an update on China's \$US1.3 trillion Belt and Road Initiative (BRI). This massive land, sea, and digital enterprise aims to create improved economic, social, and environmental conditions between China and 126 cooperating countries from Asia, Europe, and Africa through strengthened connectivity by constructing roads, railways, IT networks, power stations, pipelines, airports, and ports. President Xi acknowledged growing international concerns about environmental damage along the BRI. Now, China must commit to addressing these issues. China's use of science and technology (S&T) as an instrument to build BRI relationships should likewise be used to examine and minimize the environmental impacts of BRI projects.

As scientific studies point out, BRI projects pose substantial environmental risks. From 2014 to 2017, most energy and transport projects were tied to carbon-intensive sectors. Internationally, China continues to support coal plants. Other problems include habitat fragmentation and biodiversity destruction by road construction, air pollution from cargo shipping, and endangering water resources by hydropower.

In response to criticisms, China developed the 2017 Belt and Road (B&R) Ecological and Environmental Cooperation Plan; the Guidance on Promoting Green B&R, which highlights "ecological civilization"; China's green development strategy; and BRI's orientation toward achieving the United Nations Sustainable Development Goals. Although environmental impact assessments are major requirements of China's plan, implementation procedures do not yet exist. China even crafted a Code of Conduct for Overseas Investment and Management of Private Enterprises, but how such requirements are fulfilled and whether they will be extended to state-owned enterprises and banks are not clear. China must demonstrate the political will to put any of these plans into action.

Addressing environmental problems spanning three continents will require scientific solutions that cannot be provided by any nation alone. China's green and climate-change policies can play an important role in collaborative BRI activities. Given President Xi's recent

acknowledgement of environmental impacts, China should leverage S&T resources to address the BRI's environmental risks when implementing the 2016 BRI Special Plan for S&T Cooperation. This plan promotes people-to-people exchange, joint laboratories, and cooperative research between S&T infrastructures. However, the low budgets for international collaborative research and the restrictions on funding for foreign researchers in China and other countries limit broader cooperation that could focus on environmental issues. These barriers must be removed.

China should also involve the global scientific communities in planning and implementing the BRI. Two large international alliances were established by the Chinese Academy of Sciences and by Xi'an Jiaotong

University to support scientific cooperation and education, but addressing environmental impacts of BRI is not highlighted in their agendas. The National Natural Science Foundation of China is developing the B&R funding framework with BRI and other countries. The first joint funding program will be devoted to "sustainable development." Calls for proposals should address BRI's environmental problems too. International organizations can

also contribute to BRI-relevant issues. For example, the World Wildlife Fund's environmental analyses could be informative. The 2019 International Coalition for Green Development on the BRI, which was initiated by China and the United Nations, could be a platform for knowledge exchange. The World Bank suggested measures to reduce environmental impacts of BRI. The European Union-China Connectivity Platform includes fostering exchange on green transportation infrastructure in its Action Plan, but it needs to move from words to actions.

BRI implementation and coordination are complex tasks. If China and its BRI partners are truly committed to being open and inclusive, as highlighted in China's 2015 "Visions and Action" policy, they should also consider establishing a top-level international scientific advisory board to guide the integration of the world's best scientific capacities in the planning, implementation, monitoring, and assessment of BRI projects for global sustainable prosperity.

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