An Indian army convoy drives near the disputed Himalaya border between India and China.

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China and India: Toward a sustainable world

In light of current political tensions at the China-India border (*1*), the two countries should consider their shared purpose and the mutual benefits that would result from cooperation. Both countries face environmental challenges at global, regional, and local levels, and both have the capabilities to be global leaders in providing environmental solutions. We urge the governments of China and India to facilitate science diplomacy, starting with the Himalaya region.

Both countries have made environmental progress a priority in recent years. China and India rank first and second in greening the Earth as measured by increases in leaf area index since 2000 (*2*), and both are highly ranked in solar and wind-electricity generation (*3*). China has implemented a series of programs to assess and conserve biodiversity and ecosystems (*4*), and India has launched a national mission on biodiversity and human well-being (*5*).

Despite these potential opportunities, new restrictions have been placed on scientific collaboration between China and India, and the exchange programs between their national academies have ground to a halt (*6*). Cultural and linguistic differences, as well as political tensions such as the unresolved border disputes, create barriers to collaboration even at international meetings where both countries are represented (*7*).

Now is the time to boost bilateral collaborations. China and India should put policies in place to facilitate collaborative environmental research that moves them closer to meeting their United Nations Sustainable Development Goals, as they did when they agreed to promote a circular economy at the Sixth China-India Strategic Economic Dialogue (*8*). Organizations from both sides of the Himalaya should come together and establish joint research centers on the environment of the region and climate change adaptation and mitigation, similar to the coordination between institutes in Kunming and Guwahati (*9*). Such initiatives need to be scaled up through renewed partnerships between the national academies for joint long-term research programs as well as through coordinated dialogue in international forums, where other parties that have good relations with both countries can help foster their cooperation.

The shared Himalaya, a region with extraordinarily rich biodiversity, ice fields, and water, is threatened by some of the highest hydroelectric-dam densities and climate change rates in the world (*10*, *11*). Long-term ecological security is more important than ongoing border disputes over desolate, high-altitude lands that may be best suited as peace parks (*7*) or nature reserves (*12*). Science diplomacy on environmental issues in the Himalaya could increase the possibility of sustained peace along the international border and allow the two superpowers to lead the world toward a sustainable future.

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Conservation needs a COVID-19 bailout

Our ongoing extinction crisis (*1*) poses an existential threat to civilization (*2*), yet almost all biodiversity conservation strategies are underfunded (*3*). As the coronavirus disease 2019 (COVID-19) pandemic exposes the fragile foundation of global conservation (*4*), the ability of current conservation strategies to prevent the accelerated loss of biodiversity has become even more precarious.

COVID-19–induced reductions in trade and travel may temporarily reduce threats

to biodiversity (*4*). However, the nearly complete cessation of ecotourism and other income sources to many conservation areas and agencies is likely to drastically reduce biodiversity management and anti-poaching activities (*5*) and escalate unsanctioned resource extraction as economic hardships threaten livelihoods (*5*, *6*). Globally, governments have responded to pandemic impacts in other sectors of the economy by allocating almost US$11 trillion (*7*) of economic stimulus. However, conservation has yet to receive such stimulus packages, even though conservation is at the core of the United Nations' Sustainable Development Goals (*8*).

One of the most effective mechanisms for successful conservation of biodiversity is the establishment, expansion, and effective management of protected areas (*3*) and associated conservation lands (*9*). Ideal for economic stimulus funding, protected areas provide both direct short- and long-term economic benefits (*10*), assist vulnerable communities, and address policy needs (*11*). With clear multiplier effects, stimulus investments in protected areas will immediately promote job creation and economic activity, while subsequently bolstering national economies, maintaining vital ecosystem services, and mitigating climate change (*3*, *6*). Unlike traditional economic sectors, protected areas also have the potential to advance social development agendas, including just employment, sustainable food production, social inclusion, and access to education, safe drinking water, and dignified sanitation (*11*, *12*).

As pandemic-induced losses in biodiversity are unlikely to be recovered (*3*), the time to act is now. We urgently advocate for future stimulus packages to include funds for conservation and protected areas. These investments should be contingent on creating more resilient and sustainable models of conservation funding, increasing ownership rights, and promoting equitable development that strengthens livelihoods and benefits society as a whole.

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COMPETING INTERESTS

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Extinct-in-the-wild species' last stand

The lockdowns and closures enacted in response to the coronavirus disease 2019 (COVID-19) pandemic have led to massive income losses for zoos, aquariums, and botanical gardens worldwide (*1*–*4*). Insufficient funding could affect the ability of these institutions to support wildlife conservation, which could lead to extinctions. There are currently at least 77 species of plants and animals that are extinct in the wild and exist only in zoological and botanical collections, where they rely on human care for survival (*5*).

Most extinct-in-the-wild species exist in small, closed populations, vulnerable to stochastic demographic processes and genetic threats associated with inbreeding (*6*, *7*). For example, the sihek (*Todiramphus cinnamominus*), a kingfisher endemic to Guam, was extirpated by 1988 as a result of predation by introduced brown tree snakes (*Boiga irregularis*) (*8*). Only 29 individuals were rescued, and they have subsequently been managed in Association of Zoos and Aquariums institutions across the United States, in addition to a facility on Guam (*9*). However, because not all of the captured birds bred successfully, the current sihek population of fewer than 140 individuals descends from only 16 genetic founders. It also suffers sex-ratio imbalances. The population therefore remains at risk, and further declines through loss of zoological institution support would hamper recovery efforts (*10*).

Ideally, extinct-in-the-wild populations can increase in captivity to the point that it is safe to release them back into their natural habitat. The successful reintroduction of the ko'ko' (Guam rail, *Hypotaenidia owstoni*) onto a small island near Guam has been heralded as a major conservation success. In 2019, the ko'ko' was reclassified from extinct in the wild to critically endangered (*11*). Such successes depend on full support for the zoos, aquariums, and gardens that struggle to maintain these collections. Further population declines will jeopardize recovery and increase extinction risks. We call for urgent funding to ensure that breeding, propagation, and holding facilities have the resources to care for extinct-in-the-wild species during the COVID-19 pandemic and beyond.

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