EU policies have unintended consequences for tropical rainforests such as the Amazon.

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The global impact of EU forest protection policies

The European Union's Biodiversity and Forest Strategies for 2030 mandate protecting all remaining old-growth forests across the EU, increasing the area of habitat patches set aside within forests harvested for timber, and limiting clear-felling in timber-producing landscapes (*1*). Although saving old-growth forests is critical, standalone policies can produce unintended consequences (*2*). Without simultaneously reducing demand for forest products or increasing supply from plantations and secondary forests, such measures can lead to increased harvesting elsewhere, often in tropical countries, to accommodate demand. Shifting logging activities to countries with weaker legal protections aggravates biodiversity and carbon losses and exacerbates existing inequities in environmental burdens (*3*). Isolated policies displacing production will also undermine the EU's recent Deforestation Regulation to halt imports of deforestation-linked tropical products (*4*).

EU policies have global effects. In 2022, the share of tropical wood and furniture imports into EU27 countries reached a 15-year high of US$4.4 billion (*5*). The risk that EU harvesting restrictions will further shift harvesting pressures to the tropics is considerable. By 2050, logging limits under the EU Biodiversity Strategy could cut European roundwood production by 42%, increasing Brazilian and Malaysian non-coniferous roundwood extraction by 19% and 8%, respectively (*6*). China's analogous ban on natural forest harvesting led to a 15% increase in solid-wood imports (*7*), driving extraction into carbon-dense, endemic-rich frontiers in the Congo Basin (*8*). Meanwhile, recent European trade sanctions on Russia and Belarus have eliminated US$4.95 billion of timber imports to EU27 countries, driving a scramble for additional timber centered on the hyperdiverse tropics (*5*). Tropical harvests in old-growth forest cause disproportionate damage compared with temperate harvests as a result of higher diversity and sensitivity of tropical biota (*9*) and weaker governance in tropical harvesting regions (*10*).

To avoid worsening its global footprint, the EU must urgently integrate better mapping and conservation of old-growth forests (*11*) with additional policies. EU countries should improve timber product longevity and develop resilient, higher-yielding plantations on existing degraded lands alongside ecological approaches that restore native forest while generating timber (*12*). Better quantification of the socio-environmental consequences of homegrown and imported timber (*3*) and robust harvesting safeguards in all timber exporting nations are also needed. Crucially, EU countries must carefully consider the global consequences of domestic forestry changes and logging moratoria. Protecting European forests is laudable, but trading conservation in Europe for far greater impacts in tropical rainforests is unacceptable.

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COMPETING INTERESTS

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Solar energy projects put food security at risk

Solar photovoltaic deployment is essential to promote renewable energy transition, phase down coal-fired power plants, and achieve the Paris Agreement temperature goals (*1*). However, large-scale solar photovoltaic deployment requires a vast amount of land, and a substantial number of solar photovoltaic projects have been

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built on farmland, threatening food security (*2*, *3*). Given the ambitious climate pledges of signatory countries to the Paris Agreement, the area of land required to deploy global solar photovoltaics in the coming decades is expected to rise (*4*). Governments must act now to mitigate the fierce competition for land between solar energy and crops.

Solar energy projects have encroached on farmland across the Northern Hemisphere (*3*). In 2017 alone, China deployed photovoltaic panels on about 100 km^2 of farmlands in the North China Plain (*3*), one of China's most important agricultural regions. Solar photovoltaic panels have also been deployed over deserts, abandoned mines (*5*), artificial canals (*6*), reservoirs (*7*), and rooftops (*8*), but these options are less attractive to developers because they are more scarce, more unstable, or more expensive than farmlands.

To ensure national food security, some countries have released strict farmland protection regulations [e.g., China's Basic Farmland Protection Regulations in 1994, Germany's Federal Regional Planning Act in 1997, and South Korea's Farmland Act in 1994 (*9*)]. However, solar energy investors and developers continue to occupy farmland illegally (*10*). Local authorities provide inadequate enforcement, allowing development to proceed at the expense of agriculture.

Mitigating solar energy's land competition will require technological innovation and more sustainable deployment strategies. For example, agrivoltaic systems have been proposed that would allow crops to grow under solar panels (*11*). However, the solar panels hinder mechanized farming and harvesting, and the solar photovoltaics need to be deployed at a position much higher than crops, making the project more expensive. Scientists have also developed foldable solar cells that can be integrated into buildings (*12*).

Until these technologies are cost-effective and scalable, governments should preferentially use unproductive lands for large-scale photovoltaic deployment, prevent installations on finite arable land, and provide stricter enforcement of farmland protection policies. Satellite remote sensing technologies should be used to closely monitor solar photovoltaic panels' illegal farmland encroachment and quantify their impacts on food production. Illegally deployed solar photovoltaics should be demolished so that farmland can be restored. Governments, corporations, and nonprofit organizations should also provide funding to scientists to research and develop cost-effective, eco-friendly, energy-efficient solar cells, including agrivoltaic technology. Scientists should also work to better understand the adverse and unintended consequences of large-scale solar photovoltaic deployment to ensure that the technology provides net benefits in the future.

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Save China's gaurs

The gaur (*Bos gaurus*), the largest living bovine species, primarily inhabits tropical and subtropical broadleaf forests, bamboo forests, and sparsely tree-covered grasslands (*1*). In China, the species is mainly found in Xishuangbanna Prefecture in Yunnan Province (*1*, *2*). Anthropogenic changes have brought this population to the brink of extinction. China must take action to save this vulnerable megafauna.

Since the 1950s, crop cultivation has expanded in Yunnan, resulting in the replacement of natural forests (*3*, *4*). In some cases, these cultivated lands have even encroached into natural reserves (*3*, *5*). As a result, the gaur has lost a large area of habitat, likely forcing the population to relocate to steeper natural forest areas (*4*, *6*).

In addition to habitat loss and fragmentation, indiscriminate hunting and illegal trade have contributed to the substantial decline of the gaur population (*1*). Between 1979 and 1985, a staggering total of 83 individuals were killed by hunters in Xishuangbanna (*1*). The total gaur population in Xishuangbanna has declined from between 605 and 712 individuals in 1984 to an estimated 152 and 167 individuals in recent decades (*1*, *6*). In Menglun, Xishuangbanna, gaurs are functionally extinct (*7*).

The gaur is included on the National Class I key protected wildlife list (*2*) and classified as Critically Endangered on the Red List of China's Vertebrates (*8*). To protect the remaining gaurs, China has designated the species as a conservation priority in multiple natural reserves (*9*) and used technologies such as infrared cameras to monitor them in real time and assess their population dynamics and behaviors (*10*). However, these efforts are insufficient.

The fragmented habitats within natural reserves should be restored immediately to natural forests. In areas outside natural reserves where the gaur frequently roams (*11*), poaching should be prevented by means of increased penalties and enforcement. The Chinese government should offer subsidies and tree-planting training programs to incentivize farmers to engage in converting farmland to forests, with rewards based on their farmland area and the number of trees planted. Establishing an ecological compensation mechanism could enable farmers to participate in animal conservation efforts and receive corresponding allowances. Lastly, given that the gaur has a wide range of activity and migratory habits that allow individuals and populations to move based on the weather conditions and the availability of food and water (*4*, *11*, *12*), assisted migration may be feasible. When gaurs are trapped in unsuitable locations, unable to migrate due to barriers like villages and highways, translocating some individuals to sparsely populated and environmentally suitable areas could be successful. Without substantial additional conservation strategies, the gaur could soon go extinct in China.

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