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SAFE Act hinders US-China collaboration

The US Securing American Funding and Expertise from Adversarial Research Exploitation (SAFE) Act, introduced as Amendment 163 to the National Defense Authorization Act for Fiscal Year 2025 (*1*), would bar US scientists from federal funding if they have collaborated within the past 5 years with researchers affiliated with China, Russia, Iran, or North Korea. Prohibited activities include co-authorship on papers, joint projects, and mentoring foreign postdoctoral scholars. Such a blanket policy would fracture essential international partnerships at a moment when global challenges demand cooperative expertise.

Recent studies highlight the evolving dynamics of US-China scientific partnerships. Collaboration across disciplines increased steadily from 2000 to 2018, but this trend reversed sharply after 2019 because of US policies that began to restrict scientific relations (*2*). An analysis of millions of scientific papers found that China's role in leading US-China collaborative projects increased from 30% in 2010 to 45% in 2023. This shift reflects China's growing influence in global science (*3*). Amid geopolitical tensions, joint efforts in sustainable development research have also shown proportional declines, limiting progress on critical issues such as climate change (*4*).

Existing partnerships, however, continue to yield substantial benefits. Joint US-China efforts in artificial intelligence (AI) produce more impactful research than independent work on AI by either nation (*5*). In the automotive sector, increasing collaboration with China could revitalize US innovation by leveraging complementary strengths. For example, American expertise in advanced research and design could pair with China's manufacturing scale and cost efficiencies in electric vehicles and supply chains (*6*). Sustained US-China collaboration could accelerate innovation that benefits both nations and the world (*7*, *8*).

Safeguards already exist to protect sensitive technologies, such as the Export Administration Regulations and the International Traffic in Arms Regulations (*9*). The indiscriminate approach of the SAFE Act would isolate US researchers, accelerate shifts in global scientific leadership, and undermine the open collaboration, as warned by nearly 800 academics (*10*). Congress should reject this provision and preserve evidence-based security measures, countering unsubstantiated claims in recent congressional reports that most US-China research partnerships threaten national security (*11*).

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10.1126/science.aed7998

Smart irrigation needs smart policies in Iran

Agriculture accounts for more than 75% of Iran's water use, but water productivity—crop yield per unit of water used—is only 1.35 kg/m^3 (*1*), which can reach more than 2.0 to 2.5 kg/m^3 at the global scale (*2*). To align with its National Food Security Plan, Iran aims to reduce agricultural water consumption by 30 billion m^3 by 2032 (*3*) with smart irrigation (SI) technology that uses data and, in some cases, sensors to adjust watering, reduce waste, and enhance water productivity (*4*). SI would also use artificial intelligence (AI) to analyze data, make predictions of future environmental conditions, and better manage the supply for crops. Despite its potential, this plan is likely to fail in Iran's smallholder farming context, wasting public resources and undermining efforts to improve water and food security.

The reliability of SI in irrigation management hinges on the availability, in real time, of high-quality data on soil moisture, crop status, and local weather conditions (*5*, *6*). In Iran, these data streams are often compromised because of sparse networks of weather stations, inconsistent internet connectivity, and limited on-farm sensing infrastructure. Thus, AI may misguide irrigation scheduling, which could lead to under- or overirrigation. Evapotranspiration forecasts, critical to many irrigation algorithms, can exhibit errors of 16 to 25% for daily estimates and 11 to 16% over a 7-day span (*7*). In Iran, these errors are typically higher, ranging from 20 to 35%, depending on the region, which reflects the need for localized calibration (*8*). Moreover, the reliability of near–real-time weather predictions is especially constrained in mountainous or remote agricultural zones (*9*, *10*). Iran's complex topography, diverse microclimates, and limitations to expanding the required infrastructure compromise the applicability of SI technology.

The utility of SI also depends on access to a minimum amount of water, which is an increasingly unmet condition in many smallholder farming regions. In areas where irrigation water is already insufficient or unavailable, technologies that are unusable further widen disparities in agricultural productivity. Even in better-resourced regions, the adoption of SI may produce counterproductive outcomes through the rebound effect (*11*). As farmers improve water productivity, they may reinvest savings into expanding cultivated areas or shift to higher-value, more water-intensive crops. The resulting increase in total water use could offset efficiency gains.

Realizing the potential of SI requires implementing comprehensive water governance reforms before widespread technology deployment. This should begin with establishing basin-level governance that sets a limit on total water use, granting rights to access parts of that water, and allowing those rights to be bought and sold. The price of water should also reflect its true limited availability rather than an artificial price that can vary according to government subsidies. Without reforming water governance with smart policies, Iran likely will not achieve its ambitious water reduction target (and food security goals) through SI technology.

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Local demand for meat is contributing to the decline of wild pangolins in African forests.

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10.1126/science.aeb8221

Address domestic pressures on endangered species

This week, the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) convened in Uzbekistan. A major goal was to prevent international trade in wild species from threatening their survival by listing them in one of three appendices (each with specific international trade restrictions) (*1*). Parties to the CITES and other delegates must recognize that for species exploited domestically for different purposes (or products) than for illegal export—such as for meat and skins—resolutions focused solely on international trade regulation may yield little ecological and conservation benefits, regardless of how effectively they are executed.

Commercial international trade of four African pangolin species is prohibited under CITES Appendix I, yet recent evidence suggests that the exploitation of wild pangolins in Nigeria and possibly across African forest landscapes may be driven primarily by local demand for meat, with two-thirds of pangolin scales thrown away and the rest exported as a by-product (*2*). When a local situation such as food consumption is the primary driver of species decline, successfully curbing international trade is unlikely to halt population loss. A similar local-international divergence in use occurs for pirarucu, listed in CITES Appendix II, whose meat is a crucial part of local diets and whose skins are mainly traded internationally (*3*, *4*). More broadly, among taxa for which use as a resource is a threat to their survival, four times more species are affected by local use than by international trade (*5*). This underscores the need to ensure that CITES listings of endangered species are aligned with domestic pressures on those species.

Although certain threats, such as habitat loss and climate change, fall outside the Convention's remit, those linked to exploitation should be addressed across geographic scales (local, national, and international) to avoid counterproductive outcomes. For example, unsustainable harvesting of a species can have different local and global impacts as well as short- and long-term effects. To ensure that listings achieve intended conservation goals, CITES should identify where drivers of harvest differ locally versus internationally across its ~40,900 listed species (beginning with those classed as threatened), and such assessments should be criteria for future listing decisions. Insights from these analyses could guide targeted, context-specific interventions developed in collaboration with local authorities. CITES could then better align with complementary international treaties, such as the Convention on Biological Diversity (*6*, *7*), which possess the mandate to influence national and subnational biodiversity policies and actions.

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