

species with and without legs will lead to insights into conserved evolutionary and developmental processes. By expanding our biological studies to unusual and specialist organisms like sea robins, we can uncover and compare new biology that is critical for understanding the full spectrum of development, physiology and evolution across the tree of life.

Where can I find out more?

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DECLARATION OF INTERESTS

The authors declare no competing interests.

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Letter

In Indonesia and beyond nature conservation needs independent science

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Biodiversity conservation is a crisis discipline¹ requiring frequent evaluation of potential interventions to reduce environmental threats. To have a chance of success, past conservation activities need to be assessed, to better understand how alternative approaches affect conservation outcomes. Yet,

many governments and corporations have a vested interest in environmental debates, and promote information supporting their views, with some even suppressing relevant evidence^{1,2}. Worryingly, such actions may be undermining science as an independent guide to policymaking and conservation management.

The megadiverse nation of Indonesia harbors the largest expanses of tropical rainforest in Southeast Asia (Figure 1), with nearly unrivaled numbers of critically endangered species. Despite facing environmental challenges from much-needed socioeconomic development, Indonesia has recently achieved admirable reductions in deforestation rates and fire occurrence³. However, its efforts to cast itself in a positive light environmentally are coming at a cost.

In September 2022, five leading conservation scientists — three of whom had worked in Indonesia for



Figure 1. Imperiled species and environmental threats in Southeast Asia.

(A) Bornean orangutan (*Pongo pygmaeus*; photo © YAY Media AS/Alamy). (B) Sunda clouded leopard (*Neofelis diardi*; photo © Ch'ien Lee/Minden Pictures/Alamy). (C) Bulldozer clearing a logging road in central Kalimantan, Indonesia. (D) Great hornbill (*Buceros bicornis*; photo © Scenics & Science/Alamy).



decades — were essentially banned from conducting further research or conservation work in the country. This arose when the Indonesian Ministry of Environment and Forestry accused them of operating with “negative intentions” that could “discredit” the government⁴. A ministerial instruction ordered conservation authorities to bar the scientists from operating in Indonesia while reporting activities of any foreign or overseas-funded researchers to ministry headquarters⁴. This is not the first case of government interference in environmental science. In 2020, for instance, environmental scientist David Gaveau was deported from Indonesia after publishing estimates of wildfire extent that were substantially larger than those reported by the government⁵.

The recent ban is spurring pushback from Indonesian and Indonesia-based researchers who feel coerced to present a rosy view of the country’s environment and wildlife. Studies by both Indonesian and international researchers on sensitive subjects have stagnated for years because they require government approval before release⁶. Similarly, some researchers are feeling pressured to withdraw from publications because a public association with a sensitive topic or out-of-favor authors could provoke government repercussions. For instance, one of us (J.E.E.) had multiple Indonesian colleagues decline co-authorship on a paper on Sumatran forest conservation⁷ out of concerns that it might adversely impact their funding, research permits, or opportunities for commercial contracts in Indonesia. Even while writing this article we have had to be exceptionally careful when selecting examples, to avoid risking further reprisals against colleagues and collaborators.

The current climate of scientific suppression in Indonesia is likely to have far-reaching impacts on the country’s environment and economy. For example, conflicting reports on population trajectories of the threatened Bornean orangutan (*Pongo pygmaeus*), which triggered the recent ban on foreign researchers, could cause misdirections of important funding or uncertainty in the value of conservation interventions. Similarly, contrasting estimates of wildfires or deforestation³, and resulting uncertainties in carbon emissions, could potentially erode trust between actors in ongoing emissions-reduction schemes,

such as the U.N. REDD+ (Reducing emissions from deforestation and forest degradation) program or Norway’s International Climate and Forest Initiative. Trade under the EU’s new laws on deforestation-free commodities could also be affected.

By stifling critical research and hindering international collaborations, the Indonesian government risks damaging the reputation of its science — and hence the competitiveness of its academics and institutions for international awards and funding schemes. For researchers, collaborations with foreign institutions might provide some security against suppression, but the Indonesian government’s efforts to stifle independent research could ultimately cause investigators to abandon the country, worsening a potential ‘brain drain’ that further concentrates academic power in developed nations.

Scientific suppression is by no means unique to Indonesia. A recent survey of ecologists in Australia found widespread government interference that stifled public debate and policymaking⁸. Brazil’s former president Jair Bolsonaro severely hampered environmental governance by firing officials with opposing views on deforestation⁹. Scientists from many other countries including Turkey, Sweden and the US have experienced suppression of scientific research or reprisals following publication². Even in countries where governments are not actively suppressing science, private corporations — some of which are key drivers of global environmental declines — will attack science contrary to their interests^{2,10}.

For science to play its proper role, in Indonesia and beyond, change will have to come largely from within governments and institutions. In this vein, it is encouraging to see the outcry from Indonesian scientists and journalists over the rising infringements on academic freedoms^{4–6}. Also of note are current efforts being led by Indonesian nongovernmental groups, such as the Caucus Indonesia for Academic Freedom (KIKA), the Jakarta Legal Aid Foundation (LBH Jakarta), and Greenpeace Indonesia, to counter the rising anti-science policies in Indonesia.

To support its wider mission, conservation research needs to be free from undue influence. To help meet this aim, international funding schemes could

require data transparency for studies they support. Alternatively, scientists could take action themselves by establishing ‘whistleblower safehouses’ or anonymized journals where they can safely contribute sensitive information². Beyond this, we call on scientists working in Indonesia and globally to resist attempts by state and private actors to influence research results. For biodiversity conservation to have a fighting chance of success, scientists need to be free of such undue influence.

DECLARATION OF INTERESTS

The authors declare no competing interests.

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