DIMAS ARDIAN/BLOOMBERG VIA GETTY

Indonesian President Joko Widodo (left on banner) faces Prabowo Subianto (right on banner) for election.

the AIPI is earmarked to join the NRA.

But other scientists support the proposal, saying it will bring together resources and reduce duplication between agencies.

Subianto has not spoken publicly about his views on the mega-agency, but his vice-presidential running mate, Sandiaga Uno, said during the debate that it was "unnecessary bureaucracy". If elected, Uno says, the pair's government will boost applied science through financial or other incentives to companies that invest in research.

Widodo and his cabinet have already shaken up Indonesia's scientific community. University academics are now required to publish in international journals or risk losing some of their salary. Draft laws, if passed by the parliament, will severely punish foreign scientists who do fieldwork without proper permits. And Indonesian scientists are annoyed with Widodo for cutting the funding his government promised the AIPI's Indonesian Science Fund. This competitive grant-funding system was promised $3 million a year when it was set up in 2016 to support long-term research projects, but has so far received less than half that amount.

Widodo first announced the NRA in October. He says the current system is inefficient because funding is spread across several ministries and institutions. Documents produced by members of the parliament in November reveal that Widodo's Indonesian Democratic Party of Struggle (PDIP) plans to subsume the AIPI, LIPI and an engineering institute called the Agency for the Assessment and Application of Technology into the new agency. His party has yet to confirm whether it intends to fold in all 81 government-managed research centres, too.

If the plan goes ahead and the NRA takes control of what research is supported and funded, there will be potential for the agency to misuse its power to give money to the projects the government likes, says Berry Juliandi, secretary-general of the Indonesian Young Academy of Sciences in Jakarta.

He thinks that Widodo and his party are trying to mimic the Chinese Academy of Sciences, which functions as both a scientific think tank and an academic governing body. "This centralization approach is not compatible with our democracy," he says.

The NRA would also likely manage a one-trillion-rupiah endowment that Widodo set up last year to fund research separately from the national research budget, says Brodjonegoro.

But he says the endowment fund should be managed by the Indonesian Science Fund, which is modelled on the US National Science Foundation. Under the science fund, scientists would make grant decisions. "What Indonesia needs now is an independent funding body."

The NRA will turn many scientists into bureaucrats, says a government scientist at LIPI who asked not to be named because she is not authorized to speak to the media. "All the tasks mentioned in PDIP's plan are now being done by the ministry of research. If scientists take all those tasks, what would the ministry do?"

But Laksana Tri Handoko, who leads LIPI in Jakarta, supports the proposed agency; he says it will create a critical mass of researchers and resources that could help to improve the country's science. "But of course, its establishment is not enough to boost Indonesian research without good internal research management in the agency," he says. ■

CONSERVATION

Prison island could be nature reserve

Waters surrounding Isla María Madre host vibrant corals that have stayed relatively untouched for more than 100 years.

BY EMILIANO RODRÍGUEZ MEGA

A history of torture and repression ended in March when the Mexican government closed one of the last island prisons in the Americas. President Andrés Manuel López Obrador promised to turn the facility into a cultural and environmental education centre. But researchers are pushing for more: they want the government to fully protect the site and surrounding islands, which have remained relatively untouched for more than a century.

The penal colony — located on Isla María Madre in the Pacific Ocean — was once a strict no-go zone. The island is a two-hour boat ride from the nearest city, San Blas. And Mexico's navy patrolled nearby waters to deter prison breaks. But now that the government has closed the facility, biologists worry that illegal fishing and wildlife trafficking in the area will increase.

Mexico instituted some protections for the Islas Marías archipelago, a 245-square-kilometre region that includes Isla María Madre, in 2000. But the government allowed some fishing in the area. Fully protecting the island and enforcing the rules for the archipelago would guard against practices such as overfishing, and enable scientists to study relatively intact forests and coral reefs, says Octavio Aburto, a marine biologist at the Scripps Institution of Oceanography in La Jolla, California.

If researchers' push for extra protections succeeds, the former penal colony would join a surprisingly long line of prisons turned nature reserves. Many of these converted detention centres act as time capsules, demonstrating what an area's ecosystem used to look like ▶

before people altered it.

Data that Aburto and his colleagues have collected from Mexico's other marine parks and reserves reinforce their view that no-take zones are the best way of preserving these ecosystems. In 2012, the team reviewed the effects of fishing and tourism on ten marine protected areas in the Gulf of California[1]. All but one, Cabo Pulmo, where local families banned fishing in 1995, suffered from poor governance and enforcement. This led to a drop in the populations of predators such as sharks and snappers.

Subsequent studies[2,3] by the researchers confirmed that Cabo Pulmo and the Islas Marías archipelago contained the only healthy reefs in any of Mexico's marine protected areas in the Gulf of California.

OCTAVIO ABURTO/ILCP

The coral reefs in Mexico's Islas Marías archipelago are full of life.

These isolated places won't stop the biodiversity crisis, says Joe Roman, a conservation biologist at the University of Vermont in Burlington. "But they can provide hope for the future in areas that are often seen as a stain on human history."

One such haven is Panama's Coiba National Park, which once hosted a penal colony that closed in 2004. The island harbours healthy populations of trees, such as the ajo (*Caryocar costaricense*), that illegal logging and agriculture have largely erased from the mainland. "There's barely anything any more," says Alicia Ibáñez, an independent botanist who spent six years cataloguing Coiba's vegetation starting in 1997.

Former penal colonies can also provide a controlled space in which to measure how ecosystems recover from human activities. Before the prison on Colombia's Isla Gorgona closed in 1984, inmates cut down trees for firewood, broke off pieces of coral to line trails and hunted the island's sloths, monkeys and coatis, small members of the raccoon family. Since the prison closed, levels of biodiversity have increased. The prisoners' activities affected roughly 70% of the island, says Alan Giraldo, an oceanographer at the University of Valle in Cali. He coordinates a project studying the recovery process on Gorgona. Since the prison closed, levels of biodiversity have increased, Giraldo says. "The island is doing great."

But unless these places are consistently protected, they could go the way of other degraded ecosystems. Last year, when Aburto and his colleagues returned to a less-guarded part of the Islas Marías archipelago, they found hundreds of conch shells lying on the sea floor. Fishermen had drilled into the shells to remove the snails.

"We can't afford to lose areas that have been indirectly protected by a prison," says Aburto. "These places are surviving, and we need to take care of them." ■

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3. Ulate, K. *et al. Biol. Conserv.* **228**, 100–109 (2018).