Risks from technology-critical metals after extraction

Article *in* Nature · May 2018

CITATION
1

READS
98

3 authors:

Winfred Espejo
University of Concepción
32 PUBLICATIONS **104** CITATIONS
SEE PROFILE

Cristóbal Galbán-Malagón
Universidad Mayor
36 PUBLICATIONS **434** CITATIONS
SEE PROFILE

Gustavo Chiang
Fundacion MERI (Melimoyu Ecosystem Research Institute)
38 PUBLICATIONS **242** CITATIONS
SEE PROFILE

Correspondence

Recruit fresh talent for coral reefs

Coral reefs are again in the spotlight, having suffered mass mortality over the past two years from global bleaching events. Before reef resilience runs out, researchers must move beyond lamenting corals' lost pristine state and develop pragmatic solutions. In our view, these are likely to stem from a more diverse set of stakeholders than have participated so far.

We must ensure that reefs can continue to provide well-being for millions of people in the future, despite widespread alterations in their biological state. Degraded reefs still have the potential to provide fisheries benefits, cultural value and other sources of revenue (such as tourism), although all of these are likely to be reduced.

With 2018 designated the International Year of the Reef, fresh perspectives and approaches are needed (S. A. Hewlett *et al. Harvard Bus. Rev.* **91**, 30; 2013). New recruits should come from a greater variety of sectors (such as development, health and governance) and from a wider set of disciplines (such as the social sciences — including psychology, economics, political science and geography) than today's conservationists. Young scientists and researchers from the global south will be particularly important contributors.

Gabby Ahmadia* *World Wildlife Fund, Washington DC, USA.*
gabby.ahmadia@wwfus.org
**On behalf of 14 co-signatories (see go.nature.com/2kwzqk7 for full list).*

Atacama imperilled by lithium mining

The demand for lithium — used in rechargeable batteries for mobile phones, electric vehicles and other devices — caused a 13% surge in global production last year (go.nature.com/2guqzc8). In the Salar de Atacama in Chile, part of South America's vast 'lithium triangle' of high-altitude lakes and salt flats, more than 1,700 litres of lithium brines are pumped from the shallow subsurface every second. This intense activity in one of the driest areas in the world is causing serious friction over water rights between local communities and mining companies and is putting huge pressure on a fragile and poorly understood ecosystem.

For example, the region's isolated wetlands are rich in species that are unique to the area. These are crucial islands of habitat for migratory and resident birds, including the threatened Andean flamingo (*Phoenicoparrus andinus*). Harmful cyanobacteria usually eaten by these birds accumulate in the water polluted by lithium extraction, putting human health at risk (T. C. Wanger *Conserv. Lett.* **4**, 202–206; 2011).

A Chilean parliamentary commission has acknowledged that overexploitation of groundwater resources has damaged ecosystems in the Salar de Atacama basin, and that little attention has been paid to threats from mining (see go.nature.com/2mnhuwm; in Spanish). We urge the government to rethink its policies to account for the political, social and ecological impact of huge mining projects.

Jorge S. Gutiérrez, Juan G. Navedo *Austral University of Chile, Valdivia, Chile.*
Andrea Soriano-Redondo *University of Exeter, Penryn, UK.*
jorgesgutierrez@unex.es

Risks from extracted technology metals

The global market for rare metals from Earth's crust is on the rise because of their crucial role in technologies used in electronics, biomedicine and the automotive industry, for example. Most of these elements are extracted in African and South American countries, where environmental protections are often poor. We call for rigorous investigation into these metals' environmental concentrations, biogeochemical cycles and possible risks to human and animal health.

Technology-critical elements include tantalum, gallium, germanium, indium, niobium, tellurium, thallium and other scarce metals. Despite their economic importance (see, for example, A. L. Gulley *et al. Proc. Natl Acad. Sci. USA* **115**, 4111–4115; 2018), little is known about their environmental effects (M. Filella *Earth Sci. Rev.* **173**, 122–140; 2017). For example, tantalum increases in aquatic organisms at each successive level of the food chain (W. Espejo *et al. Environ. Sci. Technol. Lett.* **5**, 196–201; 2018) but it is unclear whether this accumulation poses a threat to humans and other consumers.

A better understanding of the effects of extraction and consumption of technology-critical elements will help to mitigate the risks to environmental and human health in producer countries.

Winfred Espejo *University of Concepción, Chile.*
Cristóbal Galbán-Malagón *Andres Bello University, Santiago, Chile.*
Gustavo Chiang Merimoyu *Ecosystem Research Institute Foundation (MERI), Santiago, Chile.*
cristobal.galban@unab.cl

Publish translations of Chinese papers

Language is still a barrier to scientific development (see, for example, V. S. Lazarev and S. A. Nazarovets *Nature* **556**, 174; 2018). We suggest that the best research papers published in Chinese or other languages (for instance, highly cited articles) should be routinely translated and republished to render them more visible to the English-language-dominated research community.

Since 1979, around 79 million papers have been published in Chinese — including in China's highest-quality journals, according to the China National Knowledge Infrastructure databases (http://oversea.cnki.net; see also *Nature* **553**, 390; 2018). Many important advances are therefore going unseen by Western researchers.

An example is a landmark study by Youyou Tu, who shared a Nobel prize in 2015 for the discovery of artemisinin and the treatment of malaria (Y. Tu *et al. Acta Pharm. Sin.* **16**, 366–370; 1981), which was cited only once outside China. And as of 2 May, all but 3 of 347 citations of the most-cited Chinese-language paper in the Web of Science Core Collection came from Chinese authors. (The paper discusses a radioisotope technique that is used to date rocks; see F. Y. Wu *et al. Acta Petrol. Sin.* **23**, 185–220; 2007).

Breakthroughs such as Microsoft's algorithm for Chinese–English machine translation could speed up international sharing of Chinese publications (see go.nature.com/2jhxuwo). Efforts need to focus on which papers should be selected for translation by engaging with publishers, authors and other experts, and on resolving copyright-ownership issues.

Juan Tao, Chengzhi Ding *Yunnan University, Kunming, China.*
Yuh-Shan Ho *Asia University, Wufeng, Taichung, Taiwan.*
chzhding@ynu.edu.cn

CONTRIBUTIONS

Correspondence may be submitted to **correspondence@nature.com** after consulting the author guidelines and section policies at **http://go.nature.com/cmchno**.