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Global demand for rare earths is wreaking havoc on one of Asia's mightiest river systems

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By  Helen Regan



Thai fisherman Sawat Kaewdam sorting his fishing net along the banks of Mekong river in the ...



Global demand for rare earth minerals is driving the toxic pollution of some

ONE OF ASIA'S MOST IMPORTANT RIVERS, THREATENING THE HEALTH AND LIVELIHOODS OF TENS OF MILLIONS OF PEOPLE.

Rare earths are at the center of furious geopolitical competition, especially between the United States and China, the latter of which has built up near-total control of the minerals as part of its wider **industrial policy**.

A global scramble to secure new sources is now on but many regions rich in deposits are already glaring examples of the cost of unchecked mining.

The mighty Mekong River is the heart and lifeline of Southeast Asia: A thriving ecosystem that meanders through six countries and supports about 70 million people who rely on the waterway for food, water, agriculture and trade.

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The river is also vital for global food production through exports of rice, freshwater fish and shrimp to countries around the world, including the United States.

“There’s not a major US supermarket that doesn’t have a product from the Mekong Delta,” said Brian Eyler, director of the Stimson Center’s Southeast Asia and Energy, Water, and Sustainability programs.

But millions of people living along the Mekong and its tributaries – who drink, bathe and fish in the waters every day – could be being exposed to

deadly toxins from hundreds of unregulated mines in the region, many of which are located in war-torn, lawless areas of Myanmar.

New research from the US-based think tank Stimson Center has mapped out on a “massive scale” more than 2,400 sites — many of them unregulated mines across mainland Southeast Asia — that could be releasing dangerous pollutants such as cyanide, mercury, arsenic, and other heavy metals directly into the region’s rivers.



A Thai fisherman collects samples to check for alleged arsenic poisoning along the Kok river in northern Thailand's Chiang Rai province. (*Manan Vatsyayana/AFP/Getty Images*)

“It’s having such an environmentally impactful effect, everything is accumulating here to a potentially disastrous result for the Mekong,” said Regan Kwan, research analyst with the Stimson Center and lead researcher of the project.

Kwan and his team analyzed satellite imagery to identify and map the mines and found unregulated activity on or along 43 rivers in Myanmar, Laos and

Cambodia. The sites include alluvial mining – mainly used to extract gold or silver and tin, in-situ leaching – used to extract rare earths, and heap leach — which is used for gold or copper, nickel, and manganese.

Each of these mining techniques uses different methods to extract the metals or minerals, often by using other chemicals such as mercury or sodium cyanide, which if not properly contained or handled can leach into the environment with potentially disastrous consequences for the rivers, wildlife, food, and human health.

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Cyanide poisoning can be fatal and causes comas, seizures, and cardiac arrest. Mercury can accumulate through the food chain, threatening plants and animals that consume it, including rice — one of the region's largest exports. And heavy metals leached during the extraction process can also build up in the environment, posing a threat to bird life, fish and humans.

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Concerns about pollution upstream have impacted downstream communities living along the Kok River in Thailand, close to the Myanmar

border, after testing reportedly showed the presence of arsenic and other minerals in the water.

"No one will eat the fish now out of the river," said Kwan. "They weren't sure they could eat the food that was being grown. They weren't sure what to do with economic activities that revolved around the river."

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"A lot of these people are subsistence farmers... They need to grow the food for themselves to eat. They need to grow food to sell," he added.

The Mekong is perceived to be a clean river system that feeds tens of millions of people, but if pollution from the rare earths industry continues to grow unbridled, the researchers fear a potential ecosystem collapse, with those living directly downstream from the mines at risk of the greatest exposure to contaminants.

"The Mekong could serve as a case of how not to go about rare earth mining, as it will cause so much damage," said Eyler, co-author of the report. "This region is not small, hundreds of millions of people (could be) affected."



Chiang Mai university students collect samples to test for alleged arsenic poisoning along the Kok river in northern Thailand's Chiang Rai province. (*Manan Vatsyayana/AFP/Getty Images*)

Mines flourish amid war

Rare earths include 17 metallic elements that are critical in everyday products from cars to jet engines to electronics like smartphones and flat-screen TVs. They're also crucial for batteries in electric vehicles, as well as MRI scanners and cancer treatments.

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The elements themselves are not rare – they're more abundant than gold but they are difficult and costly to extract, and the process can be **environmentally devastating.**

Unchecked and unregulated mining has flourished in parts of the region where lax regulation, high levels of corruption or active conflict areas go hand in hand.

While many of the mines are not new, the 2021 military coup in Myanmar, rising prices of gold, and the huge global demand for rare earths has driven increasing mining activity, according to the researchers.

"The demand for products that use rare earths is only increasing. We're betting our future on it, with clean energy projects and clean energy assets such as wind turbines," said Eyler.

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As such, these industries are booming with more mines starting or expanding operations each month in mainland Southeast Asia, the researchers said.

Almost 80% of unregulated mining activity identified in the data comes from Myanmar, which is one of the world's largest producers of rare earths.

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The country has long been a mining hub for jade, rubies, gold, copper, amber and other minerals, and the mining centers concentrated in the north and east are already renowned for being havens of dangerous, illicit and corrupt activity, where methamphetamine addiction, sex work, human trafficking and other abuses are driven by rampant poverty, dangerous working conditions and exploitation.

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The lucrative industry has been dominated by the Myanmar military and its proxy militias for decades, enriching the generals and providing cash for weapons in its longstanding fight against ethnic armed groups.

Rare earth extraction in Myanmar has rapidly grown in Kachin and Shan states since the coup and ensuing civil war, which has thrown the country into chaos, and deepened already entrenched poverty and violence. Several rebel groups control territories where a majority of the mines in the Stimson report are located, the researchers said.

“It is really almost a race to the bottom of who can mine the most,” said Kwan.

"In Myanmar, you have three ethnic armed organizations, each opening new mines on a regular basis, and they're not coordinating with each other. And the demand is still there from China to have more access to these heavy, rare earth elements."



A giant Buddha statue at a Golden Triangle viewpoint in northern Thailand's Chiang Rai province, with Thailand on left, Myanmar in centre, Laos on right. (*Manan Vatsyayana/AFP/Getty Images*)

Once mined in Myanmar, the minerals are exported to China for processing.

China controls more than 90% of the global output of refined rare earths and many of the mines in Myanmar have Chinese managers and technical operators running the sites, the researchers said.

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"Chinese nationals are always involved in a rare earth mine in Myanmar and Laos, and that's because they are the only ones who know how to do it this way," said Kwan.

China has also long been a key diplomatic backer of Myanmar's military junta and has maintained significant influence over many of the ethnic militias that operate on the other side of its border with Myanmar.

Asked by the Reuters news agency this week to comment on the Stimson Center's latest findings, China's Ministry of Foreign Affairs said it was not aware of the situation.

"The Chinese side has consistently required overseas Chinese enterprises to conduct their production and business operations in accordance with local laws and regulations, and to adopt stringent measures to protect the environment," the ministry said.

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Meanwhile, the United States recently signed memorandum of understandings with several Southeast Asian countries on rare earths, as part of its push to diversify its reliance on imports from China.

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Researchers are concerned that growing demand for rare earths and gold will only continue to increase unregulated mining in the region and are pushing for urgent testing of the rivers and floodplains to understand the extent of the problem and protect communities.

Pai Deetes, executive director of the Thailand-based River and Rights Foundation, said in a media briefing Tuesday, that human rights and environmental standards will only continue to be exploited along these rivers while Southeast Asia is at the center of the global supply chain of rare earth minerals.

“It’s unfair for this region to be the sacrifice zone for this global demand,” she said.



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