

The Opinion Pages | OP-ED CONTRIBUTOR

The World's Disappearing Sand

By VINCE BEISER JUNE 23, 2016

MOST Westerners facing criminal charges in Cambodia would be thanking their lucky stars at finding themselves safe in another country. But Alejandro Gonzalez-Davidson, who is half British and half Spanish, is pleading with the Phnom Penh government to allow him back to stand trial along with three Cambodian colleagues. They've been charged, essentially, with interfering with the harvesting of one of the 21st century's most valuable resources: sand.

Believe it or not, we use more of this natural resource than any other except water and air. Sand is the thing modern cities are made of. Pretty much every apartment block, office tower and shopping mall from Beijing to Lagos, Nigeria, is made at least partly with concrete, which is basically just sand and gravel stuck together with cement. Every yard of asphalt road that connects all those buildings is also made with sand. So is every window in every one of those buildings.

Sand is the essential ingredient that makes modern life possible. And we are starting to run out.

That's mainly because the number and size of cities is exploding, especially in the developing world. Every year there are more people on the planet, and every year more of them move to cities. Since 1950, the world's urban population has ballooned to over 3.9 billion from 746 million.

According to the United Nations Environment Program, in 2012 alone the world used enough concrete to build a wall 89 feet high and 89 feet wide around the

Equator. From 2011 to 2013, China used more cement than the United States used in the entire 20th century.

To build those cities, people are pulling untold amounts of sand out of the ground. Usable sand is a finite resource. Desert sand, shaped more by wind than by water, generally doesn't work for construction. To get the sand we need, we are stripping riverbeds, floodplains and beaches.

Extracting the stuff is an estimated \$70 billion industry. It runs the gamut from multinational companies' deploying enormous dredges to villagers toting shovels and buckets. In places where onshore sources have been exhausted, sand miners are turning to the seas.

This often inflicts terrible costs on the environment. In India, river sand mining is disrupting ecosystems, killing countless fish and birds. In Indonesia, some two dozen small islands are believed to have disappeared since 2005 because of sand mining. In Vietnam, miners have torn up hundreds of acres of forest to get at the sandy soil underneath.

Sand miners have damaged coral reefs in Kenya and undermined bridges in Liberia and Nigeria. Environmentalists tie sand dredging in San Francisco Bay to the erosion of nearby beaches.

People are getting hurt, too. Sand mining has been blamed for accidental deaths in Saudi Arabia, South Africa and Gambia. In India and Indonesia, activists and government officials confronting black-market sand mining gangs have been killed.

Stronger regulations can prevent a lot of this damage, and do in most developed countries. But there's a downside. Sand is tremendously heavy, which makes it expensive to transport. If you forbid sand mining in your backyard — as many American communities are trying to do — then it has to be trucked in from somewhere else. That drives up the price. Concrete is relatively cheap; if the cost of making a new building or road were to double, it could hit the economy hard.

Not to mention the extra truck traffic and pollution. California state officials estimated that if the average hauling distance for sand and gravel increased to 50

miles from 25 miles, trucks would burn through nearly 50 million more gallons of diesel fuel every year.

We can make more sand, but crushing rock or pulverizing concrete is costly, and the resulting sand is ill suited for many applications. We can use alternative substances for some purposes, but what other substance can we possibly find 40 billion tons of, every year?

The fishing villages in the mangrove-rich estuaries of Cambodia's Koh Kong province might be the canaries in the global sand mine. For years, villagers have complained that rampant sand mining is wiping out the crabs and fish that provide their living. Locals told me on a recent visit that families have had to send members to work in Phnom Penh garment factories, or have simply moved away. The dredging also threatens endangered native dolphins, turtles and otters.

Last year, members of **Mother Nature**, an environmental group led by Mr. Gonzalez-Davidson and others, began a campaign to rein in the mining, organizing villagers to blockade and board the dredging ships. The government, which had expelled Mr. Gonzalez-Davidson a few months earlier for blocking road access to government officials trying to reach a hydropower dam in the province, arrested three of the activists, charging them with threatening to damage dredging boats, an offense that could mean two years in prison (Mr. Gonzalez-Davidson was charged in absentia as their accomplice a few months later).

Mr. Gonzalez-Davidson, who lives in Barcelona, is petitioning to be allowed back to attend his own trial. Meanwhile, the three jailed Cambodians have been denied bail for the past 10 months. Their trial has finally been scheduled for the end of June.

There's an urgent question of justice for them. For the rest of us, there's a profound lesson. Hardly anyone thinks about sand, where it comes from or what we do to get it. But a world of seven billion people, more and more of whom want apartments to live in and offices to work in and malls to shop in, can't afford that luxury anymore.

It once seemed as if the planet had such boundless supplies of oil, water, trees and land that we didn't need to worry about them. But of course, we're learning the hard way that none of those things are infinite, and the price we've paid so far for using them is going up fast. We're having to conserve, reuse, find alternatives for and generally get smarter about how we use those natural resources. That's how we need to start thinking about sand.

Vince Beiser, a journalist, is working on a book about the global black market in sand.

Follow The New York Times Opinion section on Facebook and Twitter (@NYTOpinion), and sign up for the Opinion Today newsletter.

A version of this op-ed appears in print on June 23, 2016, on Page A29 of the New York edition with the headline: The World's Disappearing Sand.