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By Vince Beiser

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## Is Shanghai's Appetite for Sand Killing China's Biggest Lake?



Times are good for Fey Wei Dong. A genial, middle-aged businessman based in Hangzhou, Fey says he is raking in the equivalent of \$225,000 a year from trading in the humblest of commodities: sand.

I met Fey recently in a fishing village on Poyang Lake, China's biggest freshwater lake and an essential haven for millions of migratory birds and several endangered species. The village is not much more than a tiny collection of ramshackle houses and battered wooden docks. It is dwarfed by a flotilla, anchored just offshore, of colossal dredges and barges, hulking metal flatboats with industrial cranes jutting from their decks. Fey comes here regularly to buy boatloads of raw sand dredged from Poyang's bottom. He resells it to builders in booming Shanghai who need it to make concrete. The demand is voracious. In the last decade, Shanghai has built more high-rises than there are in all of New York City and added miles of road and other infrastructure. "My sand helped build the Shanghai Pudong airport," Fey brags.

While we talked, Fey ambled down the waterfront to a wrinkled fisherwoman sitting in a wooden skiff and bought a plastic bag full of crayfish to take home. After he left, I asked the woman, who did not want her name published, how the sand trade is working out for her. "The boats are destroying our fishing areas," she said. The dredging destroys fish breeding grounds, muddies the water, and tears up her nets. These days, she says, she's lucky to make \$1,500 a year.

Last year, China used enough sand to cover the entire state of New York an inch deep

The construction industry's hunger for sand is threatening much more than just this woman's livelihood. Sand mining is [wreaking environmental havoc](#) in dozens of countries. India's Supreme Court [recently warned](#) that river sand mining is disrupting ecosystems all over the country, killing countless fish and birds. In Indonesia, some two dozen small islands are believed to have disappeared since 2005 at the hands of sand miners. 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. And environmentalists tie sand dredging in San Francisco Bay to the erosion of nearby beaches.

The main driver of the sand rush is the historic change in how people live in almost every country on earth. There are more people than ever, and they are increasingly moving to cities. In 1950, some 746 million people lived in urban areas; today the number is [4 billion](#). The global urban population is rising by about 65 million people annually – the equivalent of adding seven Chicagos every year.

All those new cities require mind-boggling amounts of sand. Just about every apartment block, skyscraper, office tower, and shopping mall that gets built anywhere, from Beijing to Lagos, is made with concrete, which is essentially sand and gravel glued together with cement. Every yard of asphalt road that connects all those buildings is also made with sand. So is every window.

Urban areas are mushrooming everywhere, but China is on a city-building spree that beggars anything the world has ever seen. Over half a billion Chinese now live in urban areas, and more keep coming. China is the world's top concrete producer and by far its largest consumer. Last year, China used an estimated 7.8 billion tons of construction sand, enough to cover the entire state of New York an inch deep. In the next few years that number is projected to grow to nearly 10 billion.

All that sand has to come from somewhere. In the 1980s and 90s, the early years of Shanghai's boom, a lot of it came from the bed of the Yangtze River. That turned out to be a bad idea. Miners pulled out so much that bridges were undermined, shipping was snarled, and 1,000-foot long swathes of riverbank collapsed.

The biggest ships can haul in as much as 10,000 tons of sand an hour from the lake floor

Understandably unnerved by the damage to the nation's most important waterway, which provides water to some 400 million people, Chinese authorities banned sand mining on the Yangtze in 2000. That sent the miners swarming to Poyang Lake, which drains into the Yangtze. Now hundreds of dredges, some the size of tipped-over apartment buildings, can be seen on the lake on any given day. The biggest can haul in as much as 10,000 tons of sand per *hour*.

That, researchers believe, is a key reason why the lake's water level has been dropping dramatically in recent years. A [study by a group of American, Dutch, and Chinese researchers](#) estimates that 236 million cubic meters of sand are taken out of the lake annually – 30 times more than the amount that flows in from tributary rivers. “I couldn't believe it when we did the calculations,” says David Shankman, a University of Alabama geographer and one of the study's authors. That makes Poyang Lake the biggest sand mine on the planet, far bigger than America's three largest sand mines combined. So much sand has been scooped out, says Shankman, that the lake's outflow channel has been dramatically deepened and widened, nearly doubling the amount of water that flows into the Yangtze.

The resulting lower water levels are translating into declines in water quality and supply to surrounding wetlands that could be ruinous for the lake's inhabitants, both human and animal. Poyang Lake is Asia's largest winter destination for migrant birds, hosting millions of cranes, geese, storks, and other birds during the cold months – including several endangered and rare species. It is also one of the few remaining habitats for the endangered freshwater porpoise. Researchers warn that the sediment stirred up and noise generated by sand boats interfere with the porpoise's vision and sonar so drastically they cannot find fish and shrimp to feed on. And there are fewer fish to be found in the first place, several locals told me.

Small wonder that many of the [fishers](#) in the villages dotting the shores of Poyang have taken jobs on the sand mining boats. But it's not an option for the 58-year-old woman who sold Fey Wei Dong his crayfish. “The boats don't need us because we're too old,” she says of herself and her husband. “And we don't have enough money to buy one of our own.”

**Vince Beiser** ([@vincelb](#)) is an independent journalist working on a book about the global sand crisis for Riverhead/Random House. His work is supported by the [Pulitzer Center on Crisis Reporting](#).

*Sources: Journal of Hydrology, The New York Times, UN Population Division, Wired.*

*Photo Credit: Fishers face sand dredges in Hamashu village, Lake Poyang, used with permission courtesy of Vince Beiser.*

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