

e360 digest

Photo Essay: How Pollution Is Devastating an Indonesian Lake

By Binsar Bakkara

Uncontrolled fish farming, population growth, and logging have all taken a toll on Indonesia's Lake Toba. Photographer Binsar Bakkara returns to his home region to chronicle the environmental destruction.

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Farmers remove thousands of dead fish from floating cages in the Lake Toba town of Haranggaol in May 2016. The fish died overnight from a lack of oxygen in the water.

More than 1,500 tons of fish suddenly turned up dead in Indonesia's largest lake earlier this year, a mass asphyxiation from a lack of oxygen in the water caused by high pollution levels. The event threatened the livelihoods of hundreds of fish farmers and the drinking water for thousands of people, and it shed light on the rapidly declining conditions in Lake Toba, the largest volcanic lake in the world.

Population growth, development, deforestation, and a booming caged fishing industry have severely degraded the lake's water quality over the last two decades, scientists say. There are now 12,000 cages in the lake, each containing upwards of 10,000 fish, which is double or triple their capacities. Agricultural fertilizers, sewage, and most prominently, fish food have increased the levels of phosphorous in the lake three-fold since 2012, according to a government report. The lake, located in the northern part of Sumatra, is classified as either eutrophic or hyper-eutrophic, meaning it has excessive nutrients that can create dead zones with low oxygen levels.

Photographer Binsar Bakkara grew up on the shores of Lake Toba. While a kid in the 1980s and 1990s, "the clarity level of the water in the lake was very good," Bakkara says. "Objects at 5-7 meters in depth could be seen clearly. But nowadays, it's almost impossible to see any objects 2 meters deep because of the murky water." When he heard news of the fish kill, Bakkara headed back to the lake to document the pollution.

Scroll below to see Bakkara's images.

A worker drags a fish cage in Haranggaol, Lake Toba.

The lake's fishing industry lost more than 1,500 tons of carp and tilapia in the fish kill.

The mass fish kill took days to clean up. More than 100 Lake Toba fish farmers lost their entire stock, costing them thousands of dollars.

A boy collects water for his family on the shores of Samosir, an island in Lake Toba.

Water full of trash and milfoil, an invasive plant that thrives in nutrient-rich waters and can deplete lakes' oxygen levels, in the town of Tano Ponggol, Lake Toba.

A boy catches shrimps in an area overgrown with milfoil near Samosir Island.

Increasing nutrients in the lake have led to a proliferation of milfoil, hyacinth, and other aquatic plants.

Fishermen in an area overgrown by water hyacinth near the crowded fish cages in Haranggaol.

Children play in the water near Samosir Island.

**Binsar Bakkara** is a photojournalist based in Medan, North Sumatra, Indonesia. His images have been published in several international news outlets, including Time, The New York Times, and National Geographic. He also works as a photographer for the Associated Press.

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