

— RESEARCH BRIEF · ENVIRONMENT

The Lake's Heartbeat

What is happening to the Mekong and the Tonle Sap, and why does it matter for Cambodian food?

— THE SHORT ANSWER

Late, low and shrinking.

In 2026, the Great Lake started filling **six weeks late** and stayed low (Mekong River Commission, provisional).

Over the long term, the water flowing in has dropped by **almost 30%** (Quan et al., 2025).

This matters because fish gives Cambodians about **70% of their animal protein** (FAO Cambodia, 2026).

— KEY NUMBERS

Four numbers that tell the story



**+42
days**

later start of the reverse
flow, 2026 vs 2025 (MRC,
provisional)



~59%

of normal lake water
volume, August 2026
(MRC, provisional)



-29.4%

yearly reverse flow, 1996–
2009 vs 2010–2024 (Quan
et al., estimate)



~70%

of Cambodians' animal
protein comes from fish
(FAO Cambodia, estimate)

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WHAT HAPPENED

A river that runs backwards

In the rainy season, the Mekong rises so high that it pushes water backwards up the Tonle Sap River. This fills the Great Lake. Scientists call this the **reverse flow**.

In a typical year, the lake grows about **6 times bigger**, from about 2,500 to about 15,000 square kilometres (Mekong River Commission, estimate). This yearly rise and fall is the **flood pulse**, the lake's heartbeat.

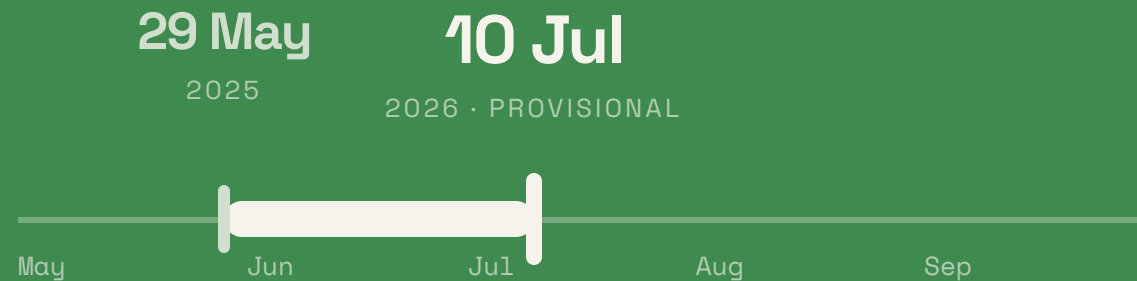
— WHAT HAPPENED

In 2026, the heartbeat was late

The reverse flow started on **10 July 2026** (MRC, provisional). In 2025, it started on 29 May. That is **42 days later** (our calculation, provisional).

By 21 September 2026, **35.67 cubic kilometres** of water had flowed in (MRC, provisional, season still running).

REVERSE FLOW START DATE



+42

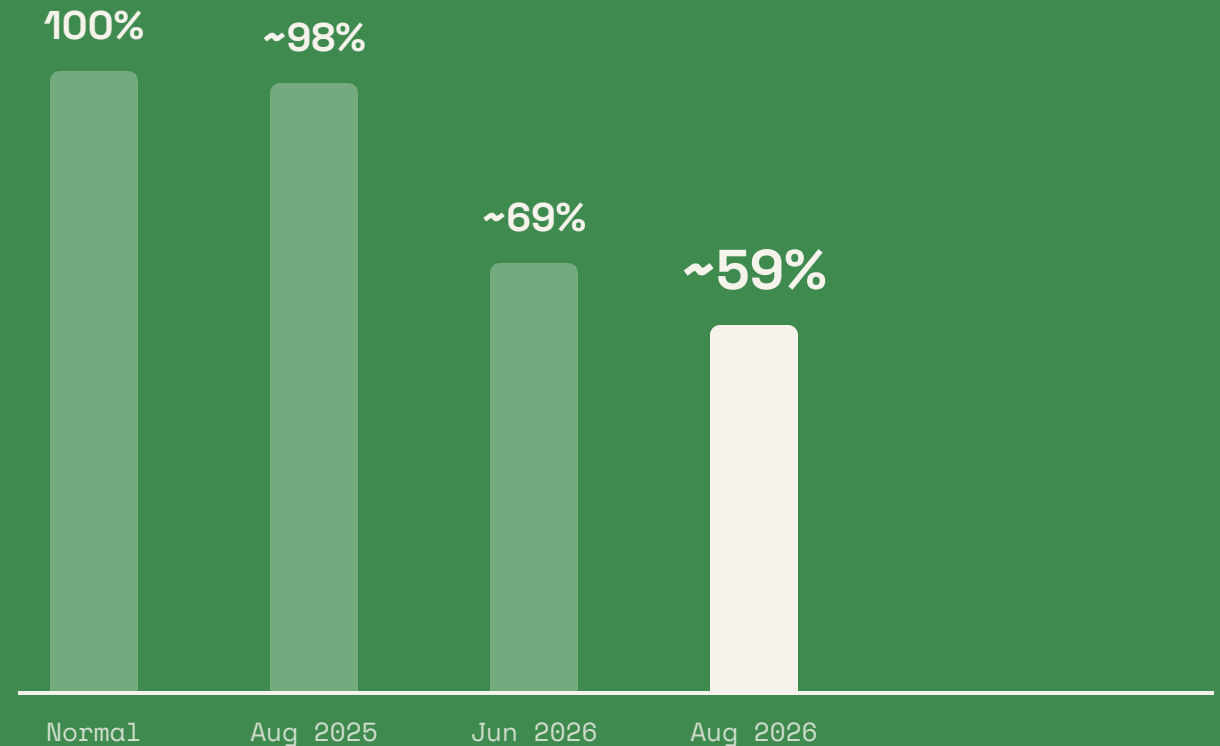
days later (our calculation)

— WHAT HAPPENED

The lake also stayed low

In August 2025, it held about **98%** of its long-term average water (MRC). In June 2026, it held about 69%, and in August 2026 about **59%** (MRC, provisional).

So about **4 in every 10 litres** of the usual water were missing (our calculation, provisional).



Tonle Sap lake water volume as a share of the MRC long-term average. 2026 figures are provisional.

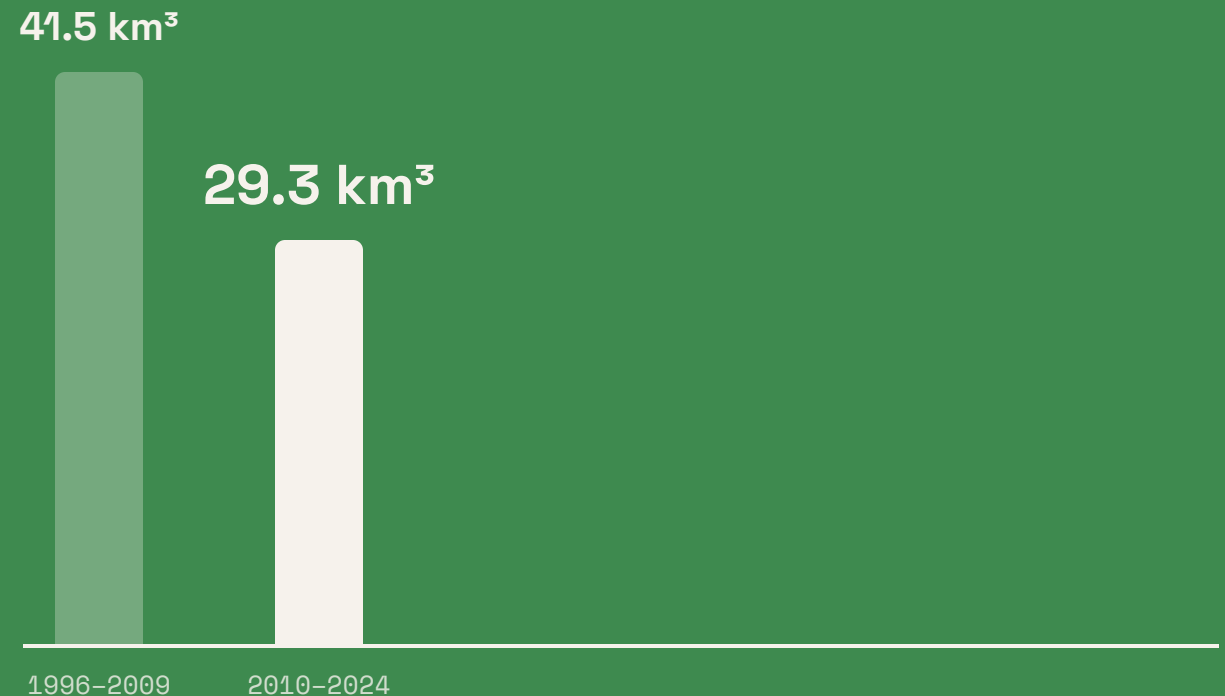
— WHAT HAPPENED

The reverse flow is shrinking over time

A 2025 study found the reverse flow is shrinking over time.

It averaged **41.5 cubic kilometres** a year in 1996–2009, and **29.3** in 2010–2024.

That is a drop of **almost 30%** (Quan et al., 2025, research estimate).



Average yearly reverse flow into the Tonle Sap, –29.4%. A yearly average: a different measure from the 2026 season total.

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WHY IS IT GETTING WEAKER?

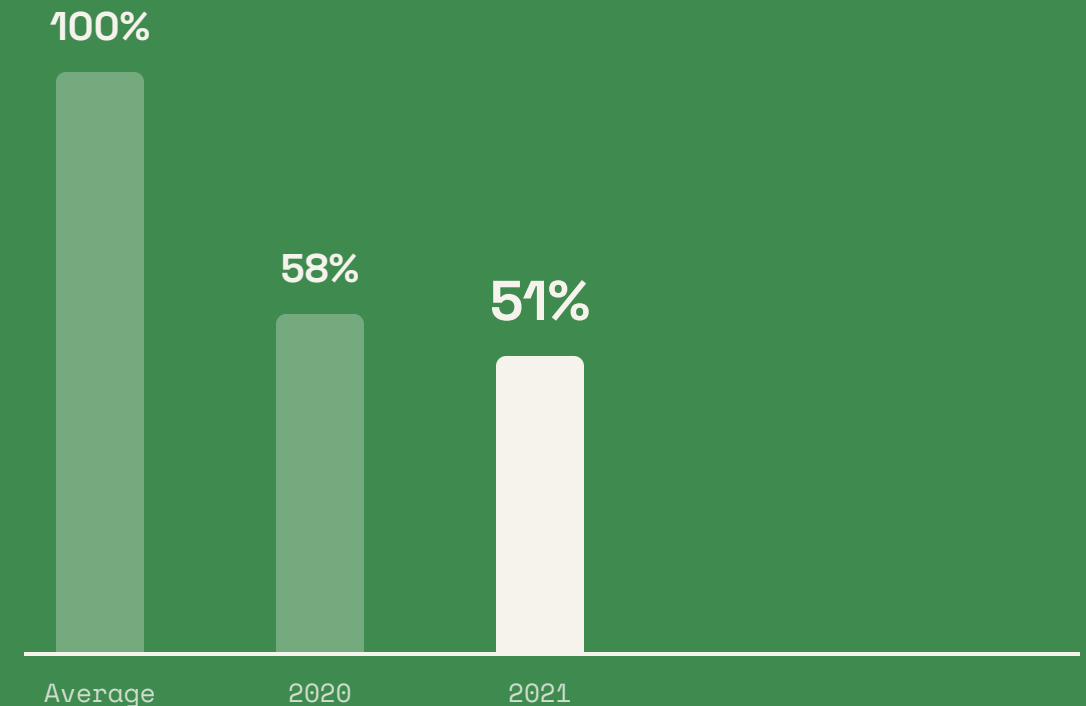
Researchers point to four forces.

- Rain
- Dams upstream
- Sand mining
- Farm water

— WHY IS THE FLOOD PULSE GETTING WEAKER?

Rain and dams upstream

- **Rain.** In 2020, the reverse flow was only 58% of its 2008–2021 average. In 2021, it was 51%. The MRC said low rain was the main driver (MRC, 2022).
- **Dams upstream.** Dams hold water in the wet season and release it in the dry season. In 2019–2021, China's two largest reservoirs held back **10 to 20 cubic kilometres** a year. That equals 30% to 60% of an average reverse flow (MRC, 2022, estimate).

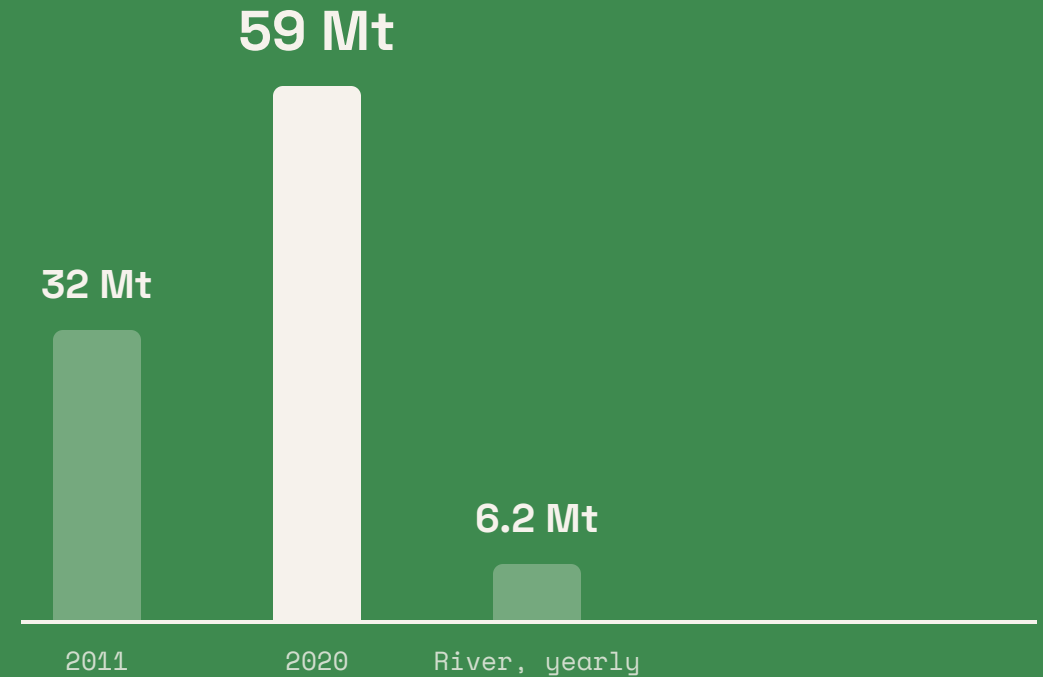


Reverse flow as a share of its 2008–2021 average (MRC, 2022)

— WHY IS THE FLOOD PULSE GETTING WEAKER?

Sand mining and farm water

- **Sand mining.** About 32 million tonnes of sand were taken from Cambodia's rivers in 2011, and about 59 million in 2020. The river brings in only about 6.2 million tonnes a year (Quan et al., 2025, estimates). So in 2020, about 9 to 10 times more went out than came in (our calculation). A deeper riverbed lets water rush past the lake, instead of pushing into it. The study estimates this alone cut the reverse flow by 40% to 50% in 1998–2018 (model estimate).
- **Farm water.** A 2022 study points to irrigation, meaning river water taken to grow crops: about 2.1 cubic kilometres a year in Cambodia's floodplains (Chua et al., 2022, estimate for 1976–2019).



Sand taken from Cambodia's rivers vs sand the river brings in each year, million tonnes (Quan et al., 2025, estimates)

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WHO IS INVOLVED

Six countries share the river

Six countries share the river: China, Myanmar, Laos, Thailand, Cambodia and Vietnam. Four are members of the Mekong River Commission: Cambodia, Laos, Thailand and Vietnam.

The MRC collects data, but it cannot order countries what to build. Since October 2020, China shares river and rain data all year from 2 stations (MRC).

— WHO IS INVOLVED

Dams bring power, and trap mud

The basin has **1,055 dams**, and 661 are operating. Together, they can produce up to **36,058 megawatts** (Ang et al., 2024, data to 2023).

Dams bring electricity and more dry-season water. They also trap **sediment**, the mud and sand a river carries, and block fish on their journeys (MRC; WWF et al., 2024).

1,055 dams in the Mekong basin

661 operating

36,058 megawatts they can produce

— 04 · RISKS AND OPEN QUESTIONS

What is at risk



Fish

The Lower Mekong catches about **2.3 million tonnes** of wild fish a year, worth about US\$11 billion (MRC, estimate). The MRC says the catch is lower in recent years, mostly from the Tonle Sap (MRC, 2023). About **1 in 5** of the Mekong's 1,148 fish species is already threatened, meaning at risk of dying out (WWF et al., 2024, assessment).



Sediment

Sediment feeds farmland. At monitored Lower Mekong stations, it fell by **about half** from 2012 to 2022 (MRC, 2023). In an MRC scenario for 2040, with no steps to limit the damage, sediment reaching the Mekong Delta could fall **97%** compared with 2007 (forecast).



The flow

If the riverbed keeps sinking, the reverse flow could fall about **69%** by 2038, compared with 1998 (Quan et al., 2025, forecast).

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WHAT IT MEANS FOR YOU

Fish on the table

About **70%** of the animal protein Cambodians eat comes from fish (FAO Cambodia, 2026, estimate).

About **4 in 10** Cambodians rely on the Great Lake and its floodplains for food and income (MRC, estimate).

— WHAT IT MEANS FOR YOU

The total grows. Wild fish depend on the pulse.

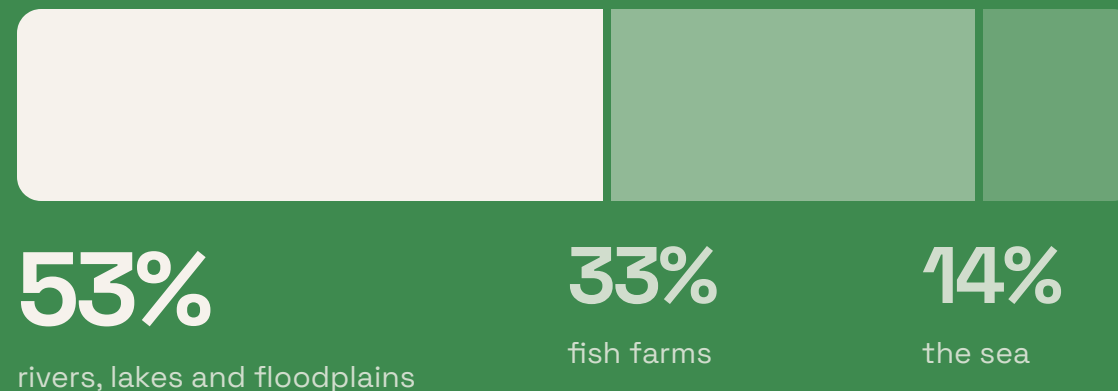
In 2025, Cambodia produced **978,560 tonnes** of fish, up 5.6% from 2024 (FAO Cambodia, 2026, official figure).

About half (53%) came from rivers, lakes and floodplains. About a third (33%) came from fish farms, and the rest (14%) from the sea (shares: our calculation).

So the national total is still growing. But the wild fish that many families catch themselves depend on the flood pulse. When the lake shrinks, fishing areas shrink too. That can mean less food for families who fish to eat.

978,560 tonnes of fish in 2025, up 5.6%

WHERE IT CAME FROM, 2025



— 06 · DIFFERENT VIEWS

Which force matters most? Views differ.



The riverbed

Quan et al. (2025) link only about 8% of the reverse-flow decline to changes in upstream flow. They say the deeper riverbed is the main driver (model estimate).



Upstream changes and farm water

Chua et al. (2022) link only 5% to 21% of the drop in river flow at Kampong Cham and Kratie to upstream changes, meaning dams and rain together. They also point to irrigation (estimate).



Dams

The Mekong Dam Monitor (Stimson Center), an independent tracker, said that in early September 2026 the river was "about one meter below normal", "mostly due to upstream dam restrictions" (the monitor's assessment).



Rain

The MRC said low rain was the main driver of the 2019–2021 low flows (MRC, 2022).



Climate

Supporters of dams argue climate change is the main driver, as reported by the International Crisis Group (2024).

ABOUT THE DATA

Read these numbers carefully

- Water data runs to 21 September 2026. All 2026 MRC water figures are **provisional**: the 10 July start, the 35.67 cubic kilometres, the 69% and the 59%.
- Lake volume is a share of the MRC long-term average, not a raw volume.
- The 2026 season total, the long-term yearly average and the 2020–2021 shares are different measures. They cannot be compared directly.
- The figures on causes are research estimates. The 2038 and 2040 figures are forecasts. The 42 days, "4 in 10 litres", "9 to 10 times" and the 53/33/14% shares are our calculations.
- Fish production uses FAO Cambodia's 2025 figures only. Dam data runs to 2023.

— SOURCES

Every number, and where it comes from

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Which force do you think matters most: rain, dams, sand or farm water?



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