

5. Grand Ethiopian Renaissance Dam – Geography

Ethiopia inaugurated the Grand Ethiopian Renaissance Dam (GERD), Africa's largest hydroelectric project, drawing formal protest from downstream nation Egypt over potential threats to its water security.

Grand Ethiopian Renaissance Dam (GERD)



Location & Background – Situated in the Benishangul-Gumuz region of western Ethiopia, around 40 km east of the Sudanese border. Initially called the Millennium Dam before being renamed GERD in 2011. Built on the Blue Nile River, which contributes the majority of the Nile's water.

Structural Features – A gravity-type roller-compacted concrete (RCC) dam – strong and cost-effective. Height – about 170 metres; Length – nearly 1,800 metres (2 km). Includes two power stations (left and right banks) housing 13 turbines in total. Three spillways manage excess water. A saddle dam supports the main dam to hold back water in adjacent low-lying areas.

Construction & Cost – Construction started in April 2011. Funded largely by Ethiopia's own resources (domestic bonds, diaspora contributions), as foreign loans were difficult due to international political opposition. Estimated cost – around USD 4–4.8 billion.

Capacity & Power Generation

Reservoir capacity – 74 billion cubic metres – one of the world's largest

reservoirs.

Power generation – Designed capacity of 5,150 MW, doubling Ethiopia's electricity output. Once fully operational, it will make Ethiopia the largest power exporter in Africa, with surplus energy for neighbours like Sudan, Djibouti, Kenya, and potentially Egypt.

Significance

Largest hydroelectric project in Africa. Seen as a national pride project symbolising Ethiopia's economic ambitions and energy independence. Though huge in African context, globally it does not feature in the top ten biggest dams by capacity.

Regional Concerns

Egypt's Concerns – Egypt depends on the Nile for 97% of its freshwater needs (drinking, irrigation, industries). The GERD could reduce Egypt's share, especially during filling and drought years, threatening agriculture and water security. Egypt calls it an "existential threat", fearing destabilisation of its population and economy. Egypt insists on a legally binding agreement on water release schedules.

Sudan's Concerns – Sudan is geographically closer and directly affected by water regulation.

Potential benefits – reduced floods, improved irrigation, cheaper electricity imports from Ethiopia.

Risks – sudden water releases, mismanagement of dam operations, or collapse could threaten Sudan's population and infrastructure.

Regional Dispute – Tripartite negotiations among Ethiopia, Sudan, and Egypt have been ongoing but inconclusive. The African Union (AU) and international actors (USA, UN, EU, World Bank) have mediated talks. Ethiopia resists external pressure, arguing that GERD is a sovereign project.

The Nile River

Overview – World's longest river (approx. 6,650 km), flowing northward from equatorial Africa to the Mediterranean. A lifeline for over 250 million people.

Drainage Basin – Covers 11 countries – Tanzania, Uganda, Rwanda, Burundi, DR Congo, Kenya, Ethiopia, Eritrea, South Sudan, Sudan, and Egypt. Supports agriculture, energy, transport, and livelihoods across northeast Africa.

Tributaries

White Nile –

- Source traced to Kagera River (Burundi/Rwanda).
- Flows into Lake Victoria (Uganda).
- Officially begins at Jinja, Uganda, exiting Lake Victoria.
- Contributes steady flow but less water volume compared to the Blue Nile.

Blue Nile –

- Originates from Lake Tana in Ethiopia.
- Joins the White Nile at Khartoum, Sudan.
- Provides over 80% of Nile's water and most of its fertile silt by the time it reaches Egypt.

Other Tributaries – Atbara River (seasonal, joining in Sudan), Sobat River, Bahr el Ghazal.

Delta – At its end, the Nile spreads into an arcuate delta in northern Egypt, before flowing into the Mediterranean Sea. This delta is one of the world's most fertile agricultural zones.

Significance – Source of drinking water, irrigation for agriculture, and hydropower for Egypt, Sudan, and other riparian states. Egypt's entire civilisation, from ancient to modern times, has depended on the Nile's flow. The river's water-sharing is highly politicised, shaped by historical treaties (1929, 1959 agreements favouring Egypt & Sudan, excluding Ethiopia).

Source – <https://www.bbc.com/news/articles/cr4qx6377qgo>