Dulovics Junior Szimpózium 2026

Infrastructure without Governance: The Hydro-Political Tension Tax in the Nile Basin

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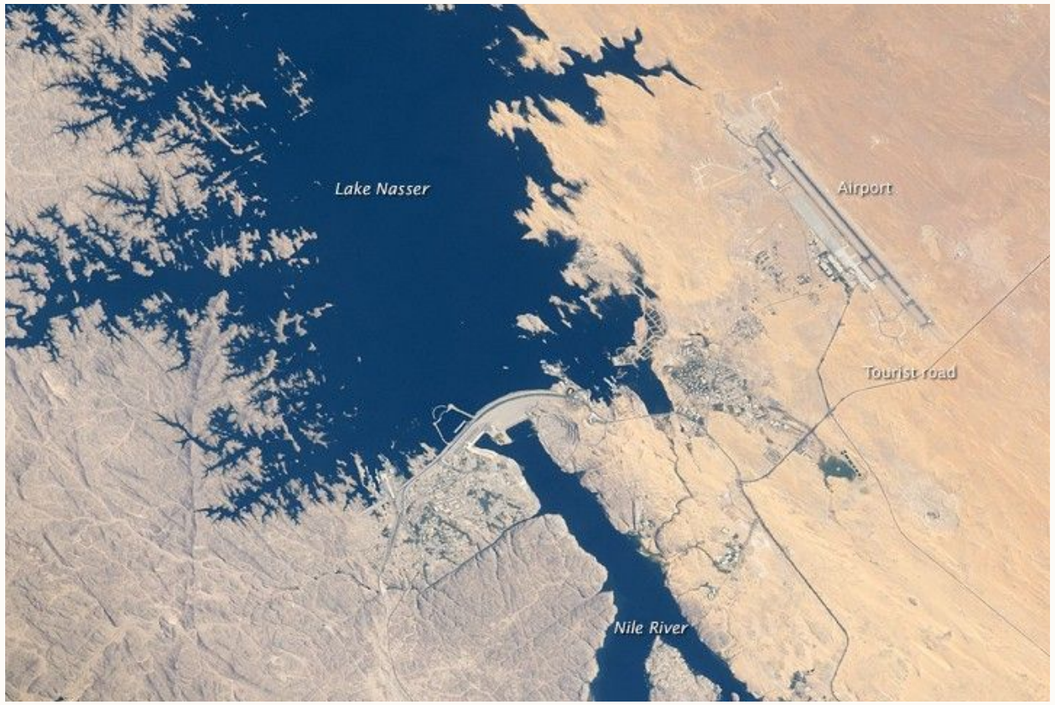
The Infrastructure Paradox

Aerial photo of the GERD: Source. The Great Africa site



Aerial photo of the Aswan High dam and the Lake Nasser: Source NASA

Physical Capacity

Decades of investment in 'hard' infrastructure like dams and hydropower.

Institutional Reality

Huge capital expenditure hasn't led to automatic security or stability.

The core argument: Infrastructure without governance becomes a liability, not an asset.

Mapping the $36.75 Billion Asset Portfolio

Core infrastructure in the Eastern Nile, valued at ~$36.75 Billion by 2025.

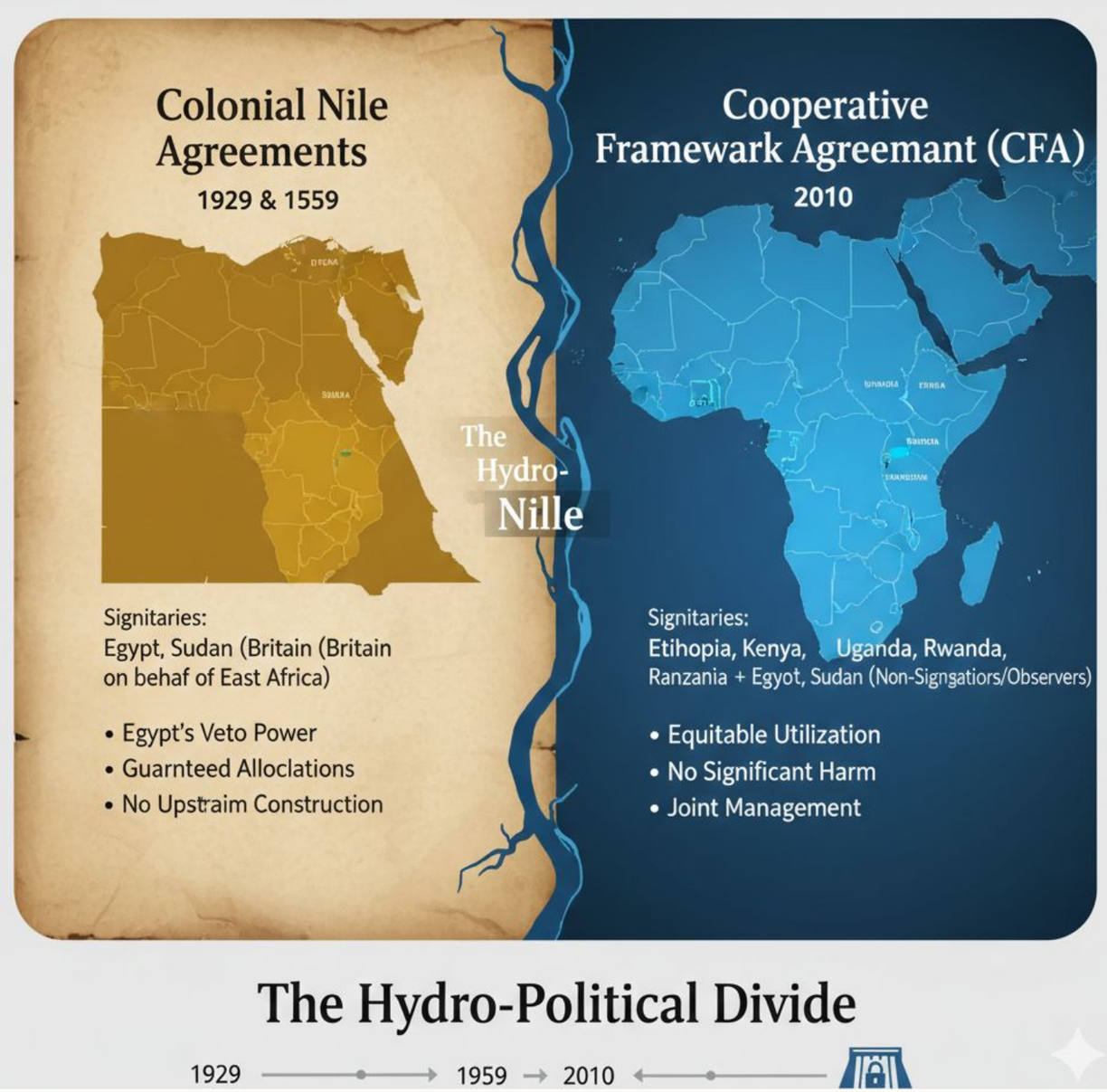
Aswan High Dam (Egypt)	**1970**	**$1.0B**	**$11.0B**
Gezira Scheme (Sudan)	**1925–1960s**	**~£11.5M**	**$8.5-9.2B**
GERD (Ethiopia)	**2011–2025**	**$4.8B**	**$6.0B**
Merowe Dam (Sudan)	**2009**	**$3.0B**	**$4.6B**
New Delta Project (Egypt)	**2021–2025**	**$5.2B**	**$5.3B**
Roseires Heightening (Sudan)	**2013**	**$460M**	**$0.65B**

These assets are often managed unilaterally, reducing overall efficiency.

Cooperative management acts as a regional wealth multiplier.

Sources: Historical data via World Bank, Egyptian Ministry of Irrigation, and National Bank of Ethiopia. Inflation adjustments (2025) calculated via IMF World Economic Outlook Database

IWRM & Institutional Fragility



Integrated Water Resources Management (IWRM)

Water management must be cross-sectoral, considering climate variability, infrastructure, and institutional arrangements.

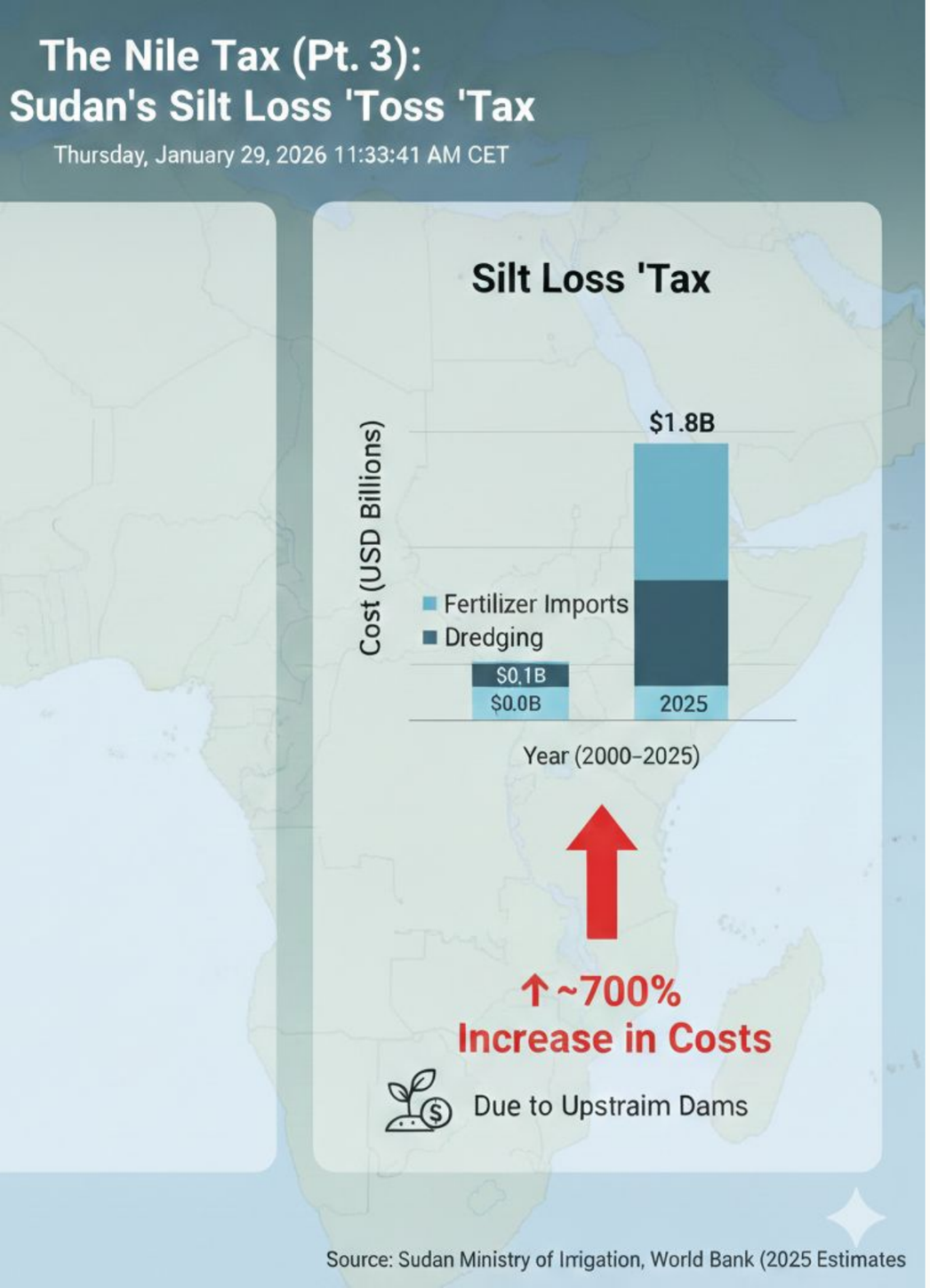
- Economic Efficiency: optimizing water use for economic benefit
- Equity : Fair distribution of water resources
- Environmental Sustainability: Protecting systems and water quality

Analyzes climate variability, infrastructure, and institutional arrangements.

The Governance Split

The Nile fails the 'Integration' test due to fragmented legal landscapes (1959 Agreement vs. CFA), creating a 'Governance Gap'.

Source: 1929/1959 Nile Waters Agreements (Egypt-Sudan) vs. 2010 Cooperative Framework Agreement (CFA); Signatory status as of Jan 2026. Visual by Gemini AI



Fragmented Water Security & Environmental

Trade-offs

Egypt: Absolute Water Scarcity

Not enough water per person to meet basic needs.

Ethiopia: Economic Water Security

Water resources exist but lack infrastructure to generate needed electricity.

- **Silt Trapping:** 98% of silt trapped at Aswan, forcing farmers to use expensive chemical fertilizers.
- **Salinization:** Reduced natural flushing leads to increased salinity in the Delta, threatening agriculture.

Infrastructure impacts natural processes, creating new environmental and economic challenges.

Source: Sudan Ministry of Irrigation & World Bank Estimates; Visual generated by Gemini AI

Source: FAO (2024) & MDPI Land Degradation Monitoring; Visual generated by Gemini AI.

Tier 1: The "Unilateralism Gap“ and operational loss

Transparency Gap

Secrecy around dam operations fuels downstream fear and suspicion.

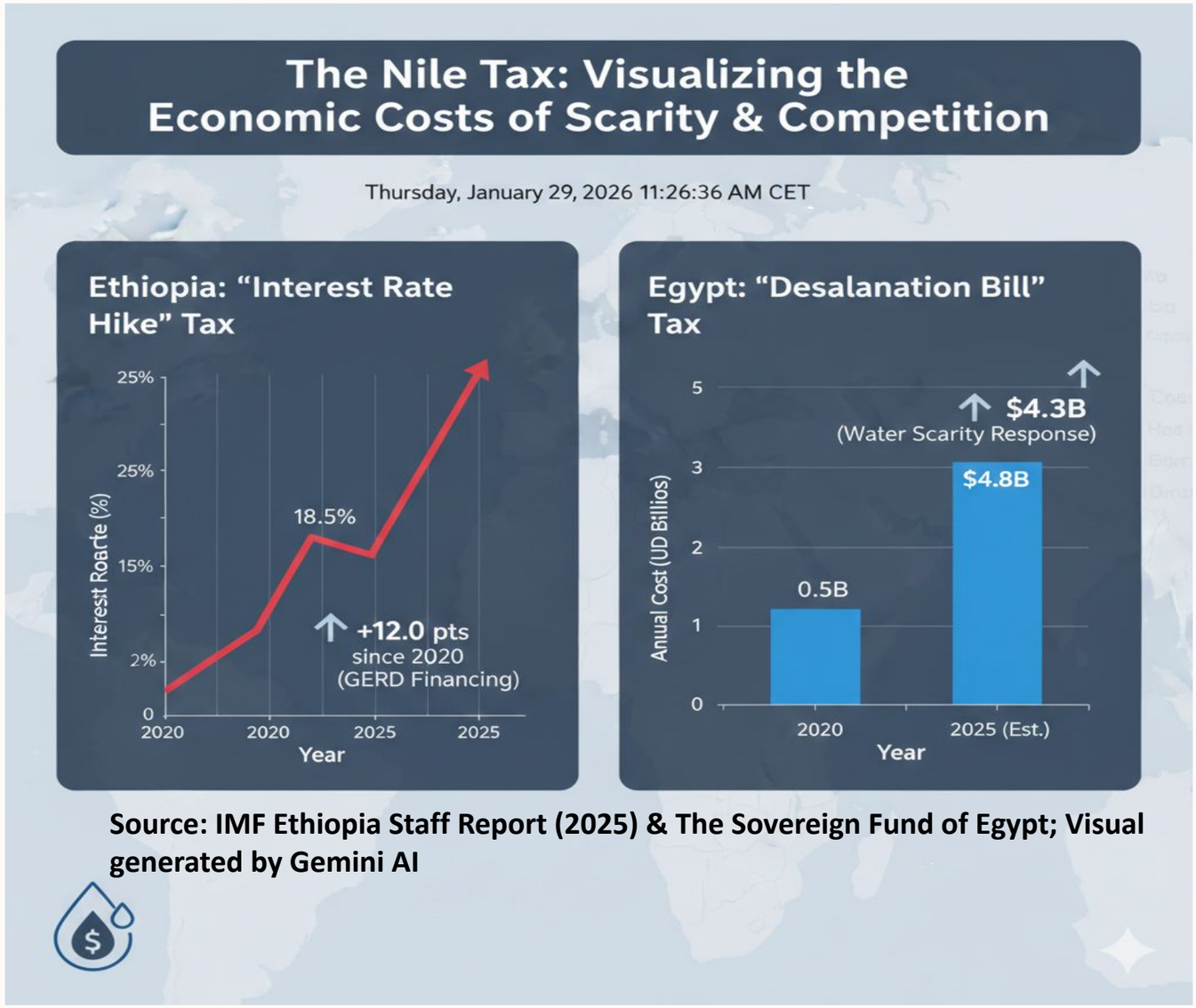
Accountability

Lack of mechanisms to manage transboundary impacts of large dams.

Operational Loss

5–8 Billion Cubic Meters (BCM) of water lost annually due to "safety buffers" from lack of data sharing.

Tier 2 & 3: The "Tension Tax" & Investment Risk



Source: IMF Ethiopia Staff Report (2025) & The Sovereign Fund of Egypt; Visual generated by Gemini AI

Sovereign Risk

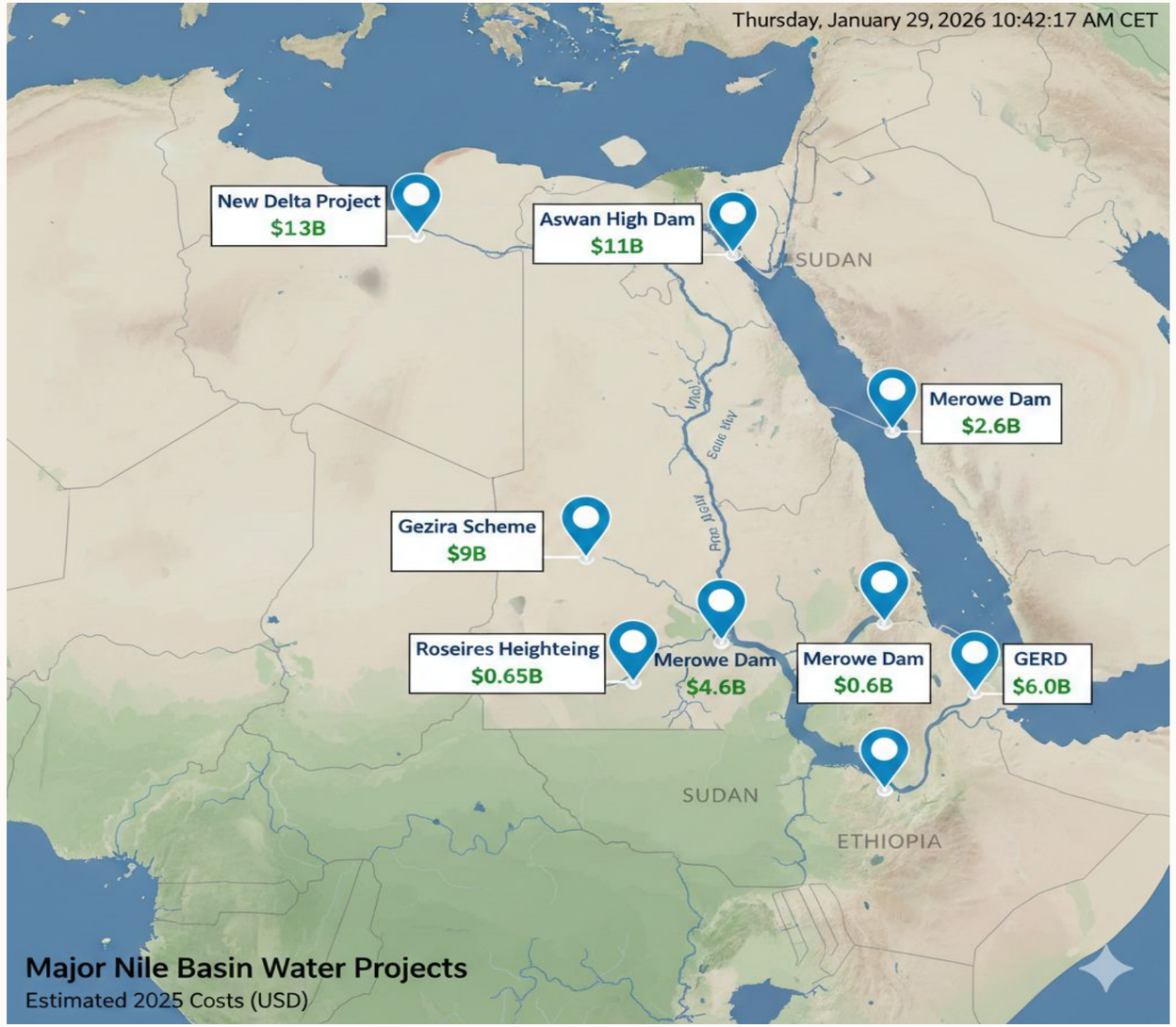
20% premium on Ethiopia's bonds for GERD funding due to hydro-political tension.

Defensive Spending

Egypt's $3B investment in desalination as a "defensive" cost, diverting funds from other development.

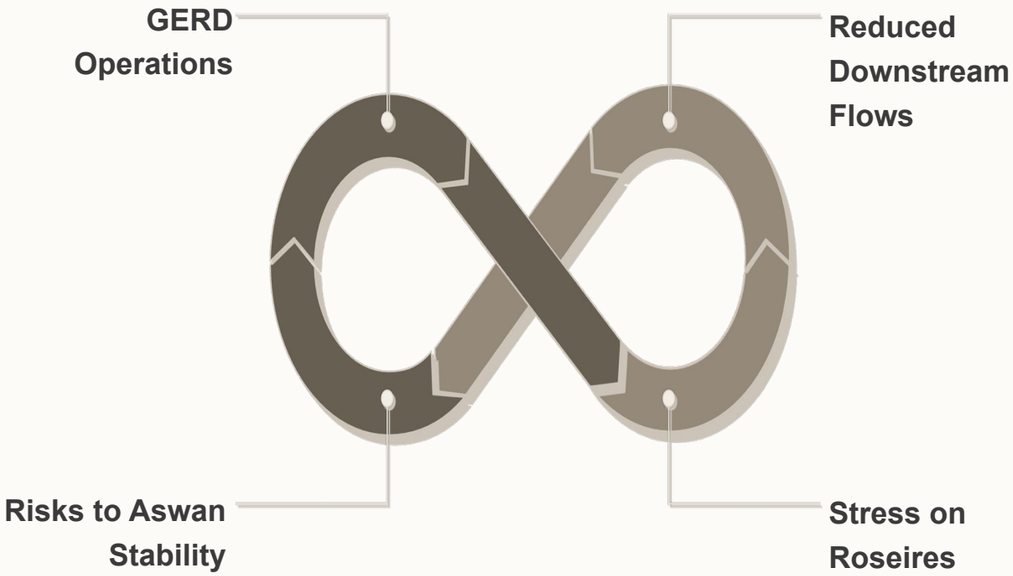
Lack of cooperation creates tension and directly impacts the national budget. diverting funds from development to risk mitigation and emergency measures.

The Cascade Effect & Systemic Risk



Source: Mapping data via NASA Earth Observatory & World Bank; Costs adjusted to 2025 USD via IMF Global Database. Visual synthesized by Gemini AI, 2026.

The Nile is a "coupled system." What happens at the GERD dictates what happens at Roseires, which dictates what happens at Aswan.



Without a shared "operating manual," managing this multi-billion-dollar system with uncoordinated actions creates significant systemic risk.


FROM LEAKAGE TO INVESTMENT
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?
THE "TENSION TAX"
IDENTIFIED
HOW DO WE STOP PAYING IT?
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Action Plan: The "Hydraulic Treaty"

01

Data-sharing Protocols

Implement real-time hydrological data exchange for transparency and efficiency.

02

Drought Protocols

Establish agreements to mitigate economic impacts during periods of low rainfall.

03

Hybrid Engineering

Train professionals in both engineering and international law, polcy for integrated management.

04

Policy Coherence

Align national water goals with basin-wide sustainability and infrastructure planning.

THANKS FOR LISTENING