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WATER PEOPLE HEALTH
Coping with the Floods

Global Downstream Context: Shared transboundary challenges (Indus/Brahmaputra basins) and lessons for Pakistan

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Objectives

- Global downstream challenges
- Indus Water Treaty: Environmental Concerns
- Actionable strategies

Downstream Challenges: Sediment & Delta Dynamics

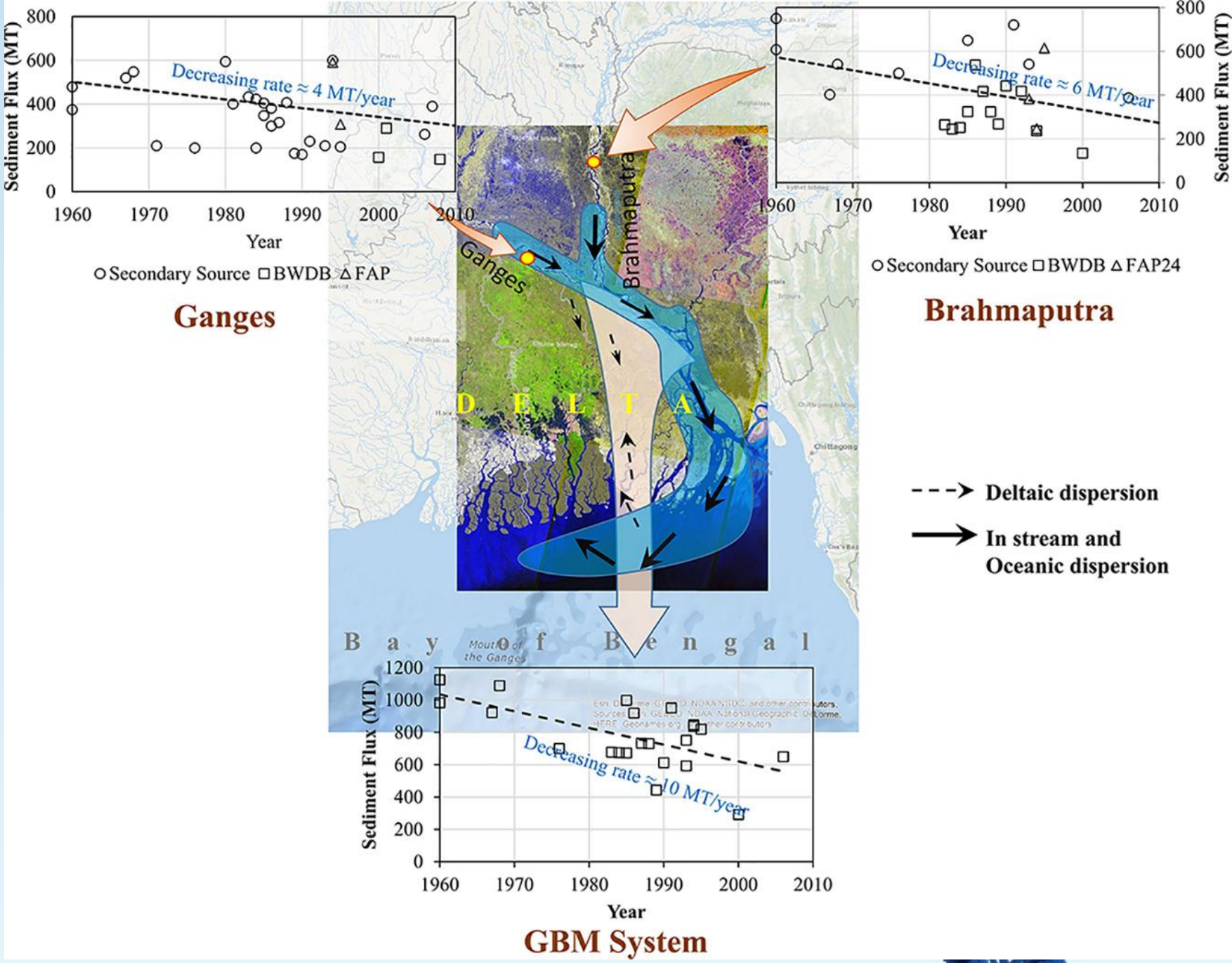
Disruption in sediment flow, Dams trap this vital silt, effectively **"starving" the delta**

Fig. 4 | **Sediment budget in the Ganges–Brahmaputra–Meghna delta system.** Sources and sinks based on literature values[52,73,77,183–185]. Numbers represent percentage distributions of sediment entering (red) and leaving (orange) the delta, and dotted blue line represents the approximate location where the delta receives 100% of its sediment before depositing it downstream.

Source: Paszkowski, A., Goodbred, S., Borgomeo, E. et al. Geomorphic change in the Ganges–Brahmaputra–Meghna delta.

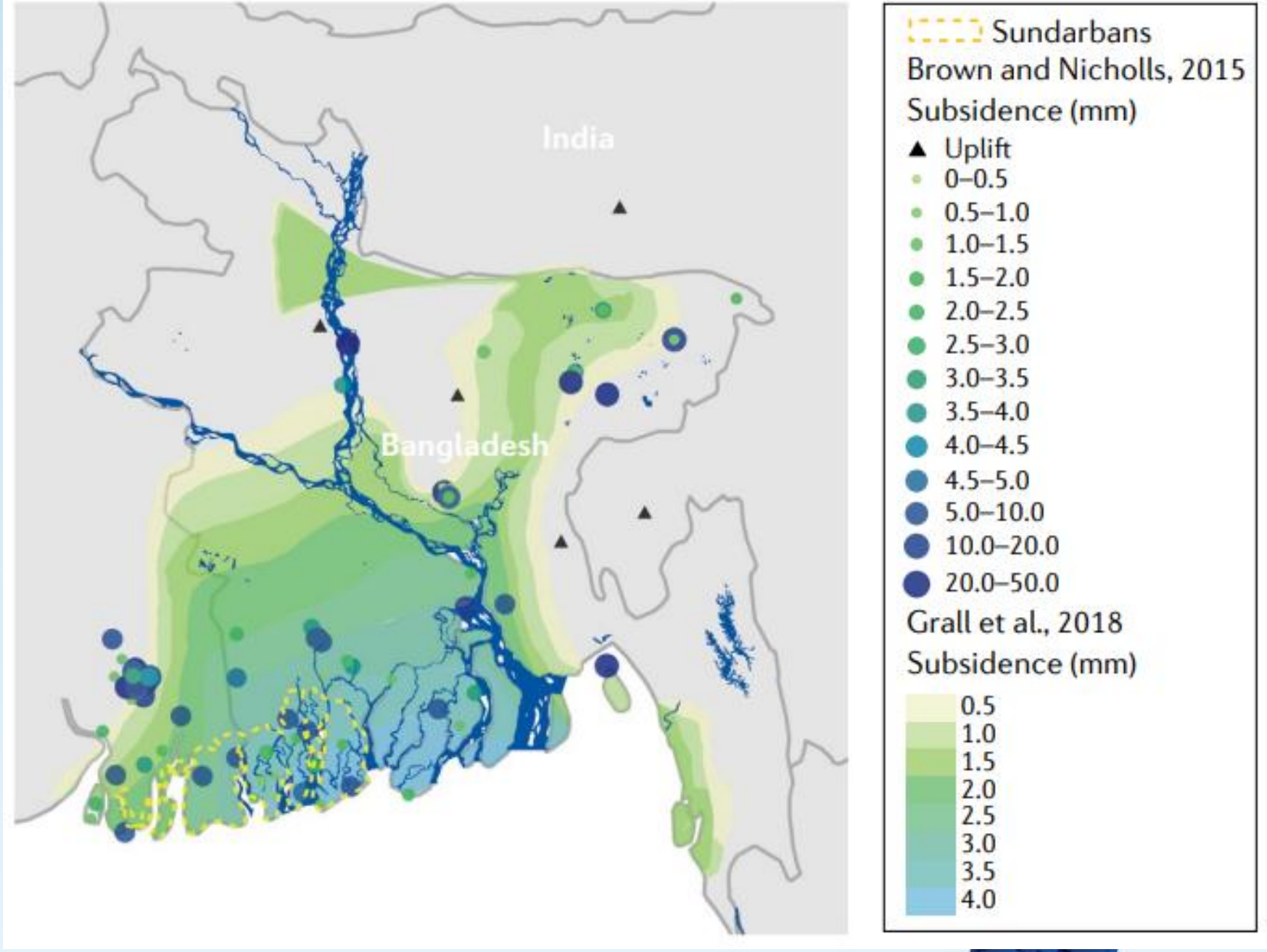
Downstream Challenges: Sediment & Delta Dynamics

Halt the natural process of land formation, reduce soil fertility, and accelerate coastal erosion and land **subsidence**



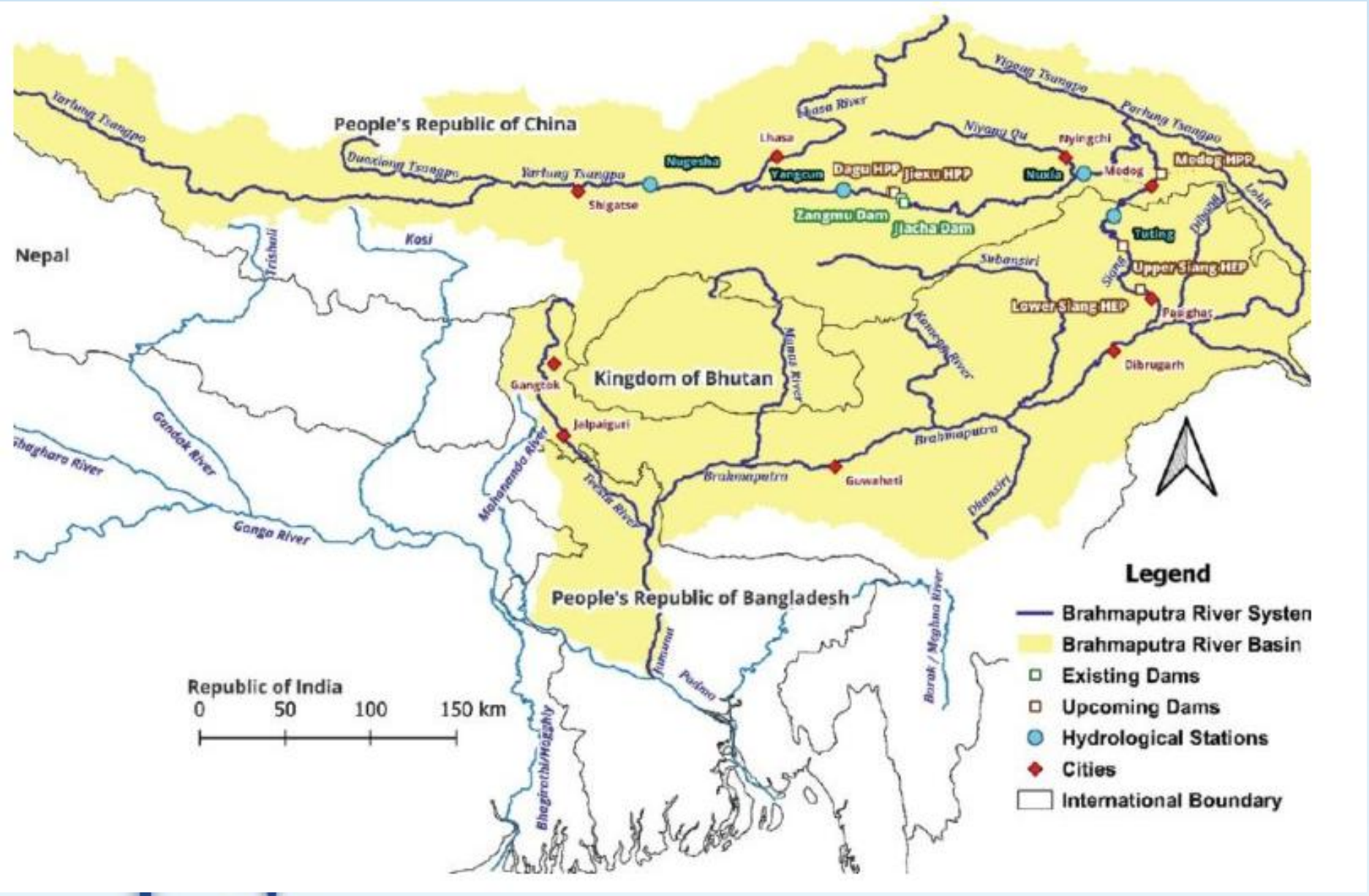
Source: https://doi.org/10.1016/j.scitotenv.2018.06.147.

Downstream Challenges: Subsidence



Source: Paszkowski, A., Goodbred, S., Borgomeo, E. et al. Geomorphic change in the Ganges–Brahmaputra–Meghna delta. Nat Rev Earth Environ 2, 763–780 (2021). https://doi.org/10.1038/s43017-021-00213-4

Downstream Challenges: Alter Flow regimes



- Reduction in hydrologic functions of floodplains
- Any alteration, diversion, or reduction of this flow by upstream countries directly threatens the availability of water for agriculture, industry, domestic use, environmental flow

Source: https://india.mongabay.com/2025/02/commentary-how-data-deficiency-is-hindering-hydro-diplomacy-between-china-and-india/

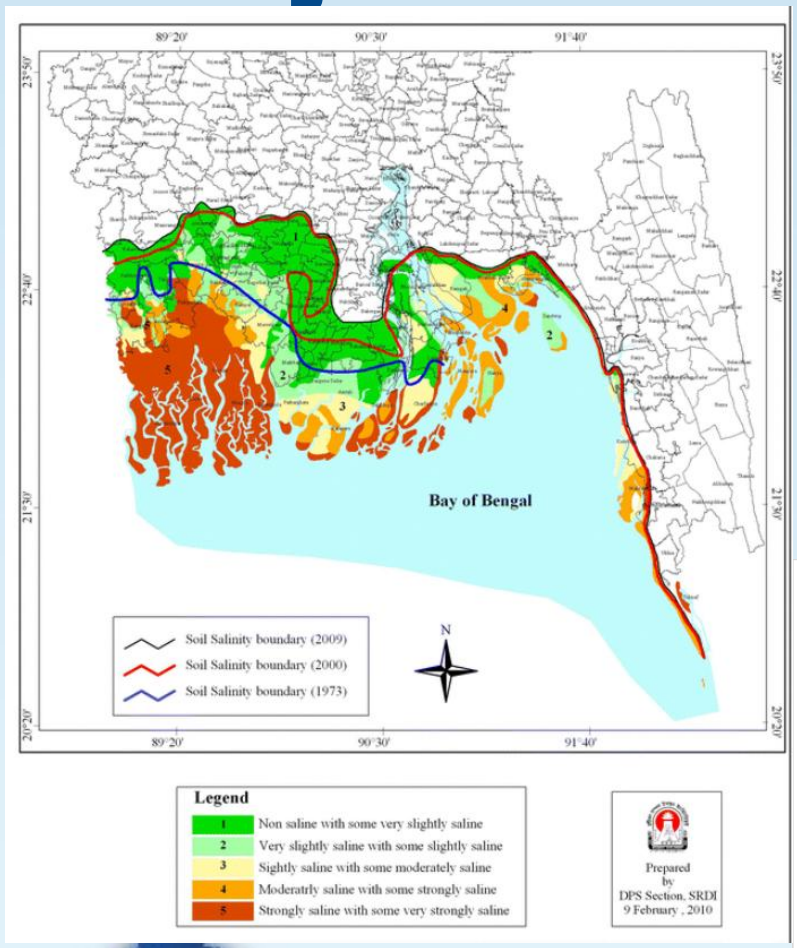
Downstream Challenges: Reduction of flow

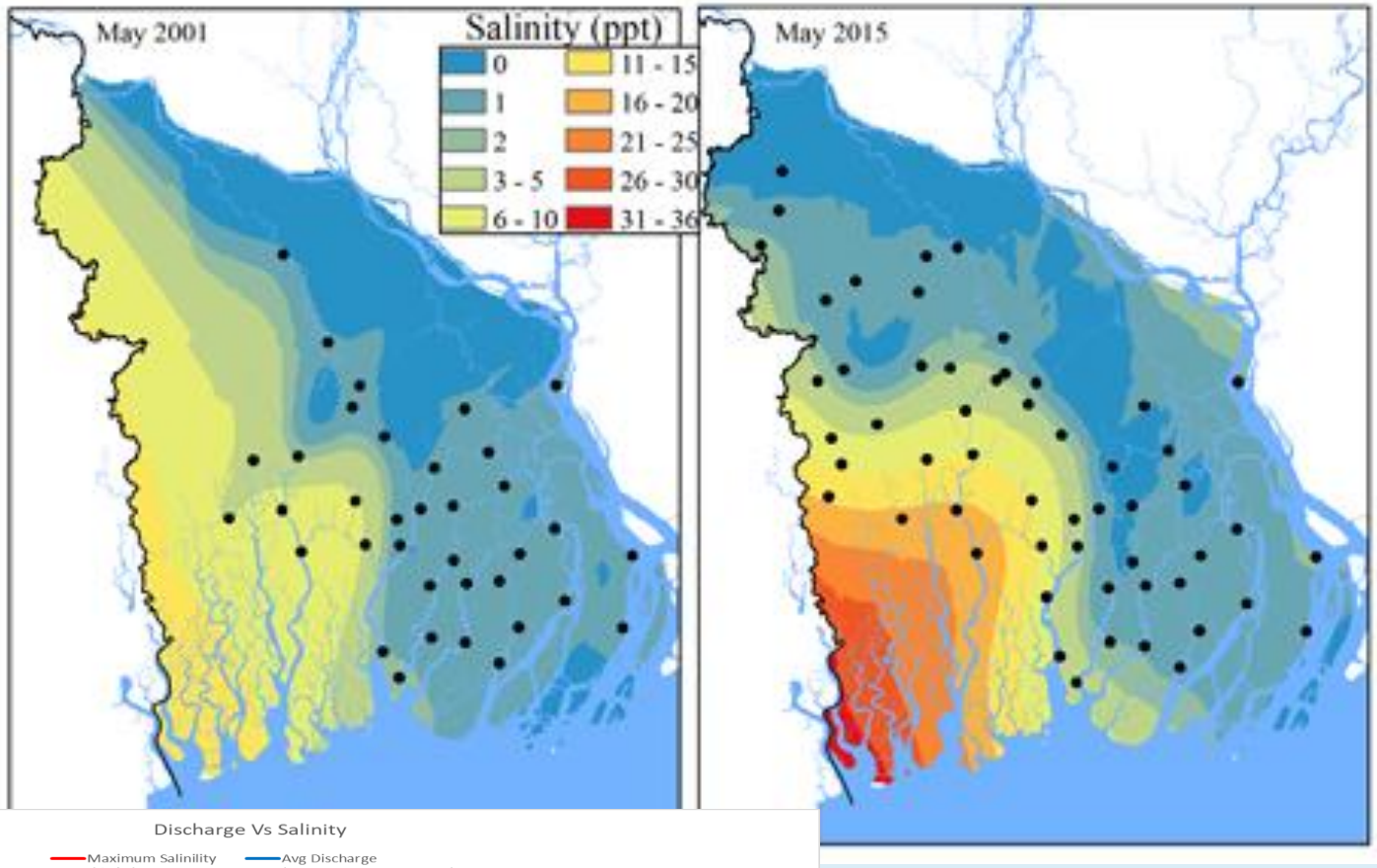
Drought

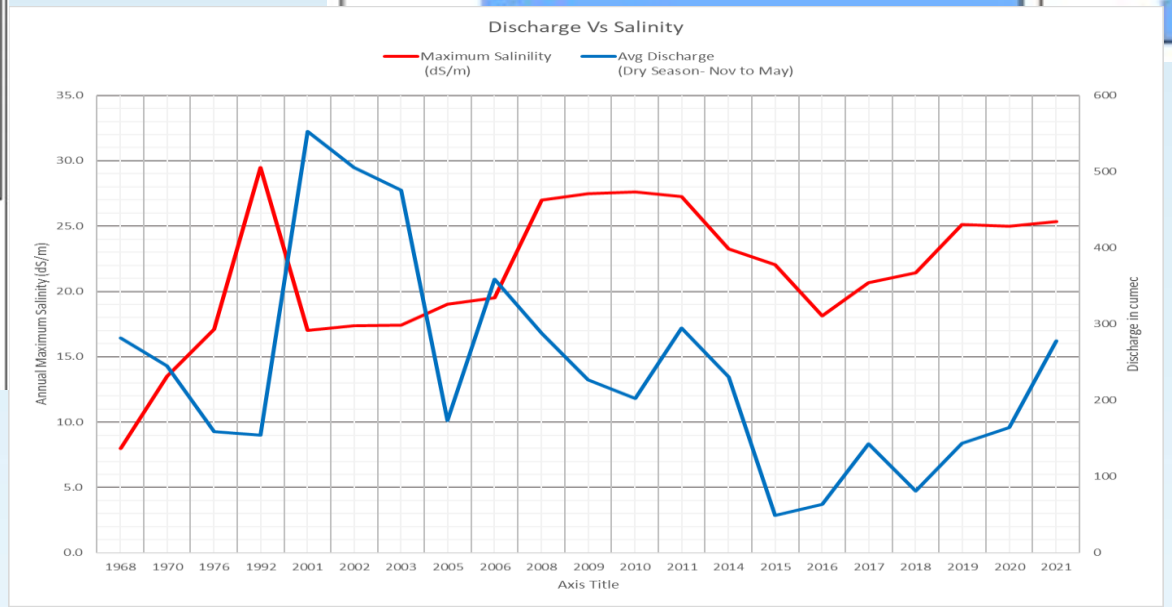
Photo courtesy: Dr. Ishtiaque, IWFM, BUET

Gorai Bridge, Magura, The Daily Star, 10.21.2014

Downstream Challenges: Salinity Intrusion







https://doi.org/10.1111/1752-1688.12775

Downstream Challenges: Transbo undary Data Sharing

- Under bilat ral agreeme ts, Ind nd China share real-time hydrolog l data ing monsoon season.
- Previous data sh 15
- **On Octob** e Teesta River Flow ca ern Bangladesh
- The flood r **968**, wreaking havoc across the ba
- New data sharing perio **ay 1 ct 31**

Need for Year-round Continuous Data Sharing

Downstream Challenges: Transboundary Treaties

- Bilateral/ Multi-lateral

Example from Bangladesh: The Ganges Water Treaty (1996)

- Earlier:
  - ✓Short-term sharing arrangements in 1975
  - ✓A 5-year agreement in 1977 (1978-82)
  - ✓Two MoUs in 1982 (1983-84) and 1986 (1986-88)
  - ✓Formation of Joint River Commission

"Statistical analysis of the post-Treaty data (1997–2016) also indicated that **65% of the time** Bangladesh **did not receive its guaranteed share** during critical dry periods with high water demand."

A critical review of the Ganges Water Sharing arrangement
Kazi Saidur Rahmana,b,*, Zahidul Islamc,†, Umme Kulsum Naverad and Fulco Ludwiga
Water Policy 21 (2019) 259–276 A

Transboundary Treaties: Challenges

- Basin-wide approach
- Rigid treaties under shifting climate
- Political constraints and geopolitical tensions
    - Internal and interstate politics: Teesta negotiations affected by West Bengal’s position

Flip side of the coin: Nile Basin Initiative

Basin countries:

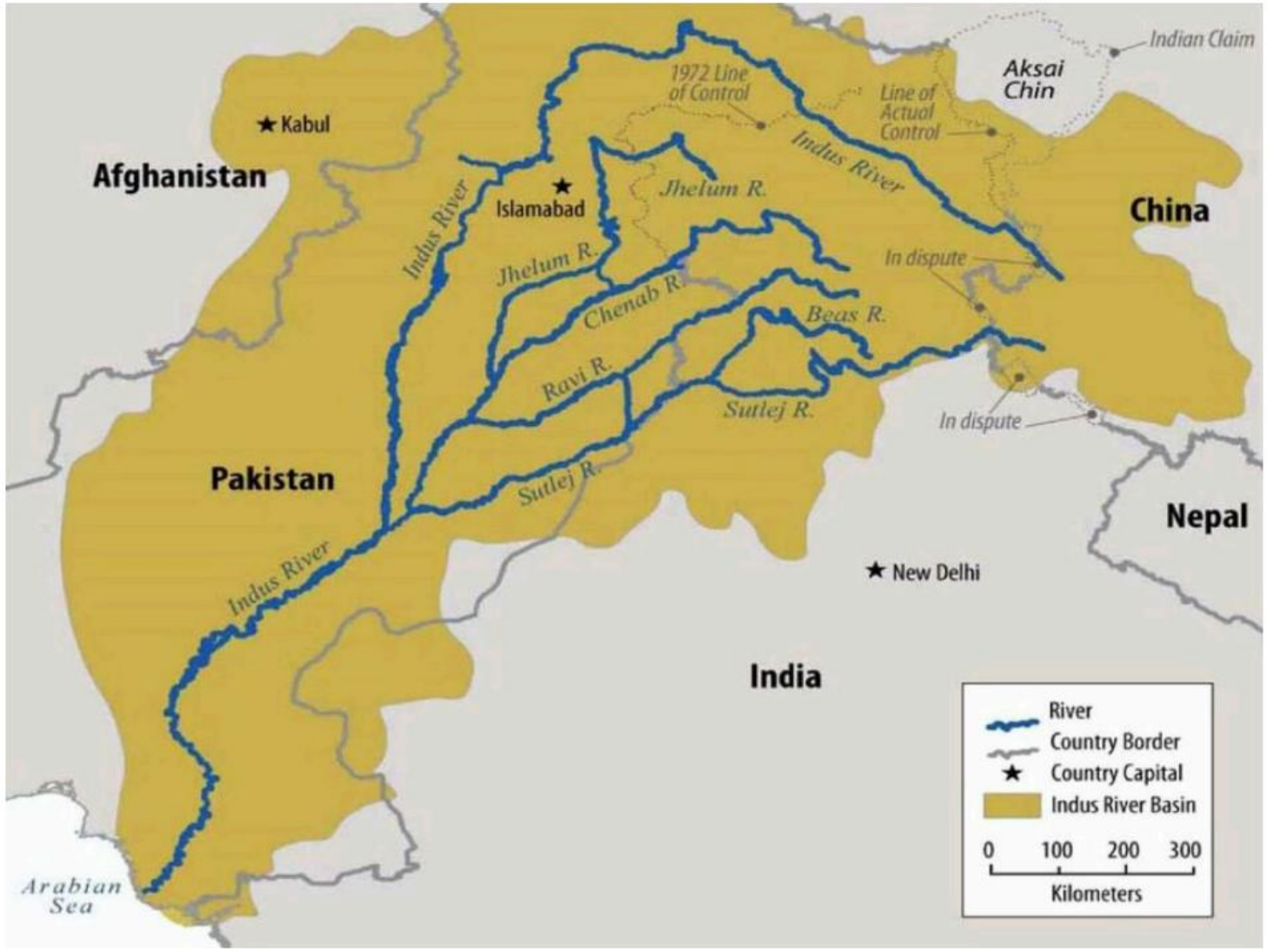
Burundi, Democratic Republic of Congo, Egypt, Eritrea, Ethiopia, Kenya, Rwanda, Sudan, Uganda and the United Republic of Tanzania

- A Non-classical case of dispute

- NBI (a promising example of water sharing)
  - launched in 1999
  - basin-wide framework
  - Joint-problem solving
  - guided by a ‘shared vision’ (SVP)
  - equitable ‘benefit’ sharing

Indus Basin and Its Challenges

- Shared by Afghanistan, China, India, Pakistan
- 80% flow from upstream catchments
- Highly glacier-fed system with rising variability



Source: Clingendael, Netherlands Institute of International Relations, July 2025

Indus Waters Treaty (IWT)

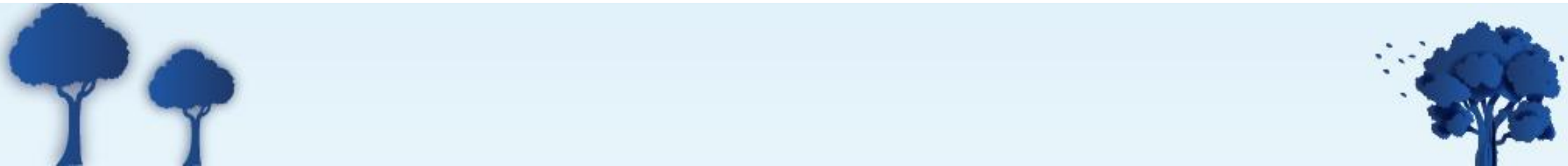
- Signed in 1960, mediated by World Bank
- Allocates western rivers to Pakistan
- Stressed under new hydrological realities
- 2025 suspension highlights vulnerability

THE BIG QUESTION

Features | India-Pakistan Tensions

Can India stop Pakistan's river water — and will it spark a new war?

The decades-old Indus Waters Treaty faces its gravest challenge as India suspends it, prompting Pakistan to warn of war.



No role to play beyond facilitator: World Bank President Ajay Banga on Indus Waters Treaty

World Bank President clarifies role in Indus Waters Treaty, emphasising facilitation only amid India-Pakistan tensions

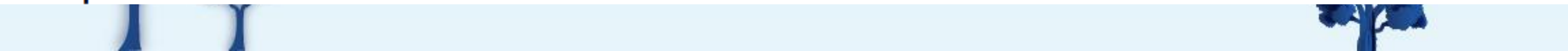
Updated - May 09, 2025 05:26 pm IST - New Delhi

CONFLICTS | **INDIA**

Can India and Pakistan move past their Indus water row?

Murali Krishnan New Delhi
08/28/2025

The vital water-sharing treaty between Pakistan and India has had its day in court. The Hague-based Court of Arbitration ruled that India should "let flow" the rivers for Pakistan's use. New Delhi remains unimpressed.



Afghanistan To Echo India's Indus Water Move, Stop River Flowing Into Pakistan

The Taliban's move to limit flow of water into Pak echoes steps taken by India after the terror attack in Jammu and Kashmir's Pahalgam on April 22, specifically suspending the Indus Waters Treaty.

NDTV News Desk | World News | Oct 24, 2025 12:53 pm IST

Treaty in abeyance: a political and hydrological quake

On 23 April, 2025, India put the Indus Water Treaty (IWT) of 1960 with Pakistan in abeyance, by temporarily suspending it under certain conditions. The move followed the Pahalgam attack in

An article by Tobias Von Lossow (18 July 2025)

"With mounting water pressures, there is no alternative to Indus water cooperation—it requires both sides to re-engage and update the treaty or create a new framework."

Source: https://www.clingendael.org/publication/indus-water-treaty-2025-pause-cooperation-not-end

IWT: Environmental Concerns

- Provisions regarding water quality are limited, basing acceptable standards on historical practice rather than ecological protection
  - “…undue pollution of the waters of the Rivers which might affect adversely uses similar in nature to those to which the waters were put **on the Effective Date…**“
  - This ties the pollution standard to potentially low mid-20th-century uses and does not account for future environmental or ecological requirements

IWT: Environmental Concerns

- **Acceptance of Dilution as Sanitation**: The definition of "Domestic Use" explicitly includes the use of water for "sanitation (including the conveyance and dilution of sewage and of industrial and other wastes)".
- This fundamentally treats the rivers as acceptable conduits for waste, relying on dilution.

IWT: Environmental Concerns

- **Criterion of Reasonableness:** While the treaty requires sewage or industrial waste to be treated "**where necessary"** to not materially affect uses, the criterion for reasonableness "**shall be the customary practice in similar situations on the Rivers".**
- If customary practice involved minimal treatment and high reliance on dilution, the environmental protection afforded would be minimal

IWT: Environmental Concerns

- IWT-**Perpetual Construction Due to Sedimentation**: Annexure E acknowledges that Live **Storage Capacity of a Storage Work will be reduced by sedimentation**. In this event, India is permitted to "construct new Storage Works or modify existing Storage Works so as to make up the storage capacity lost by sedimentation".
- This provision **institutionalizes the cycle of environmental impact by permitting future large-scale construction** to compensate for the known consequence of upstream dams.

Actionable Strategies: Environmental Perspectives

- Prevent and control pollution (through an inventory of pollution sources, joint water-quality objectives)
- Salinity based Environmental Flow for Delta
- Share data and information; conduct shared research and/or development projects;

Actionable Strategies

- Multilateral Initiatives / Basin-wide management

- "A **single comprehensive agreement** on **all** their 54 **transboundary rivers** instead of pursuing lengthy negotiations for each river separately"- Sumit Vij, Professor, WUR, Netherlands

- Integrated way
  - River Flow = Water Flow and Sediment Flow
  - Quantity and Quality

Actionable Strategies

- Climate stresses: "**climate change should not be made into a scapegoat for explaining away preparedness gaps within and between countries**"[1]
- Benefit sharing
- Real-time inflow/outflow networks
- Data, Delta, and Diplomacy

[1] Shaikh Rokon, head of Riverine People, a Bangladesh non-profit promoting stewardship of rivers and inshore wetlands

https://www.context.news/climate-risks/south-asia-floods-expose-gaps-in-regional-climate-cooperation (Journalism from Thompson Reuter's Foundation)


Thank you