

INTRODUCTION

Satellite Evidence for Customary International Water Law Compliance

AUTHOR(S)

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1-2 SENTENCE FRAMING

In transboundary river basins, upstream unilateral mega-dam construction and altered environmental flows threaten downstream water security. This case establishes an operational and legal blueprint for deploying open Very High-Resolution (VHR) satellite imagery as a neutral, verifiable source of information to enforce customary international water law and protect vulnerable populations from hydro-hegemony.

TIMEFRAMES & URGENCY

Accelerating climate shocks and geopolitical tensions in regions such as the Sahel and North Africa make transboundary water disputes critical. Downstream communities face acute environmental and socio-economic crises before traditional diplomatic mechanisms mobilize, requiring a real-time, independent verification infrastructure.

STAKEHOLDERS

Data Users: Downstream agricultural communities, pastoralists, and vulnerable riparian populations.

Intermediaries: Civil society think-tanks, regional research networks, and legal advocacy groups (e.g., CSDS acting as trusted data intermediaries).

Decision Makers: International legal arbitrators, transboundary river basin commissions, and regional environmental ministries.

THE DECISION CHALLENGE

THE SITUATION

WHO IS AFFECTED?

Downstream agricultural communities, pastoralists, and vulnerable riparian populations are facing severe water scarcity. An upstream nation is unilaterally altering vital transboundary river flows without sharing hydrological data, while official state narratives mask the ecological fallout. Local communities lack the objective proof required to challenge these upstream policies.

WHAT ARE THE DATA NEEDS?

AOI: Upstream reservoirs, dam construction sites, and downstream agricultural floodplains.

Frequency & Resolution: Sub-meter VHR imagery with high-frequency revisit (< 3 days) to track reservoir filling rates, volumetric changes, and agricultural drought expansion in real-time.

THE DECISION CHALLENGE

WHAT DECISIONS NEED TO BE MADE?

International Arbitrators: Determining whether upstream actions violate the core customary rules of *equitable and reasonable utilization* and the *obligation not to cause significant harm*.

Local Intermediaries: Deciding how to authenticate and publish satellite evidence without exposing vulnerable local communities to state retaliation.

WHY ARE THEY DIFFICULT WITHOUT THIS DATA?

Commercial VHR data is prohibitively expensive, politically embargoed, or controlled by well-resourced state actors. Downstream nations suffer from severe information asymmetry, lacking the objective proof needed to initiate binding international arbitration.

HOW WOULD SATELLITE IMAGERY BE USED?

Intermediary organizations ingest Common Space open VHR data, run open-source hydrological and AI/ML change-detection models, and produce verified, audit-ready compliance reports for courts and river commissions.

IMPACT, RISKS & GOVERNANCE QUESTIONS

WHAT CHANGES WITH OPEN IMAGERY

- **Systemic Shift:** Democratizes geospatial truth, shifting transboundary water management from secretive state power plays to transparent, evidence-based diplomacy.
- **Community Agency:** Equips local actors with independent scientific proof, transforming them from passive victims **who have less say on water management** into empowered participants in resource governance.
- **Environmental Impact:** Promotes better management of shared transboundary resources and encourages more sustainable water usage.

POTENTIAL RISKS

- **State-Led Censorship:** Upstream governments attempting to embargo AOs or criminalize local data intermediaries.
- **The Compute Divide:** Local actors having "free data" but lacking the cloud computing infrastructure or localized AI models required to process massive VHR imagery volumes.
- **Politicization:** Risk of state actors weaponizing satellite reports to inflame regional disputes or delegitimize environmental findings.

GOVERNANCE QUESTIONS

- ? **Access Tiers:** Should raw tasking rights for transboundary conflict zones be restricted to vetted civil-society intermediaries to prevent state-sponsored surveillance?
- ? **Accountability & Liability:** What legal liability does Common Space assume if its independent satellite evidence triggers geopolitical sanctions or is contested by a sovereign state?
- ? **The Compute Mandate:** How can Common Space structurally guarantee that open data is paired with open compute credits for Global South institutions, preventing Western technological monopolies?