

DEVELOPMENT OF INTERNATIONAL MECHANISMS FOR THE GOVERNANCE OF TRANSBOUNDARY WATER RESOURCES IN THE CONTEXT OF THE CLIMATE CRISIS

Expert report

Contents

Introduction 3
Problem statement and justification of relevance 3
Mandate of the committee 4
History of the agenda and previous United Nations decisions 5
Organization and structure of the report 6
Chapter 1. Current state and global hydroclimatic baseline 8
1.1. Dynamics of transboundary systems (2023-2026) 8
1.2. Geographic mapping and high-risk hotspots 8
1.2.1. The Nile River Basin (Eastern and Northern Africa) 9
1.2.2. The Mekong River Basin (Southeast Asia) 10
1.2.3. The Lake Chad Basin (Sahelian zone) 10
1.3. Operational gaps in the security framework 11
Chapter 2. Institutional and legal problems in the climate crisis 13
2.1. Key trends 13
2.2. Current state of affairs 13
2.3. Causes and consequences 14
2.4. Existing measures and limitations 14
2.5. Case studies 15
2.5.1. Indus Basin (India-Pakistan) 15
2.5.2. Nile Basin (GERD) 15
Chapter 3. Financial mechanisms and source-to-sea integration 17
3.1. Key trends 17
3.2. Current state of affairs 18
3.3. Causes and consequences 19
3.4. Existing measures and limitations 20
3.5. Case studies 21
3.5.1. Senegal River (OMVS) 21
3.5.2. Lesotho Highlands Water Project (LHWP) 22
3.5.3. Danube River and Black Sea Strategic Partnership 22
Chapter 4. Key stakeholders and strategic divergences 24
4.1. State coalitions and strategic interests 24
4.2. Non-state actors 25
4.3. Critical lines of divergence 26
Conclusion 28
Actionable recommendations and conditions for implementation 28
Action to be taken by the Economic and Social Council 30
Annex. Comparative statistical indicators by basin and region 32
References 33
Glossary 36

Introduction

1. Transboundary water governance is among the defining institutional and geopolitical challenges of the twenty-first century. Shared river basins, lakes, and aquifers span 47% of the Earth's land surface, account for more than 60% of global freshwater flow, and sustain over three billion people. Traditional international water law was built on the core principles of equitable and reasonable utilization and the duty to prevent significant harm. However, these legal foundations rested on the assumption of hydroclimatic stationarity: the idea that natural water systems fluctuate within historically stable and predictable parameters.

Problem statement and justification of relevance

2. Global warming has dismantled the foundation of hydroclimatic stationarity. Rising global temperatures have driven severe glacier retreat, altered seasonal precipitation patterns, and prolonged droughts, prompting United Nations University scientists to designate our current reality as the Era of Global Water Bankruptcy. Climate stress hits shared waters through two distinct channels: chronic degradation and acute shocks.

3. Chronic degradation manifests as multi-year droughts, progressive aquifer depletion, and structural aridification, which steadily contract baseline water supplies. Acute shocks arrive as extreme floods, glacial lake outbursts, and storm surges, which overwhelm storage infrastructure, contaminate drinking supplies, and displace communities. Despite these compounding vulnerabilities, the international legal architecture remains incomplete. According to the 2024 UN World Water Development Report, only a minority of transboundary basins are governed by operational cross-border agreements. Data from the 2024 third reporting cycle for SDG Indicator 6.5.2 reveals that only 26 of 153 sharing states have all their transboundary basins covered by operational arrangements. Furthermore, only 14%

of shared river basins possess a dedicated climate change adaptation strategy, leaving most international basins unprepared to coordinate emergency responses during severe weather events. The central question is whether existing legal and institutional arrangements provide the operational capacity needed to manage shared water-related risks under changing climatic conditions. The analysis therefore considers both the coverage of existing arrangements and the institutional, financial and political factors affecting their implementation.

Mandate of the committee

4. The Economic and Social Council exercises a central coordinating role within the United Nations system under Chapters IX and X of the UN Charter. The Council is mandated to advance international economic, social, environmental, and humanitarian cooperation, serving as the principal United Nations platform for policy review, dialogue, and recommendations on sustainable development.

5. Within transboundary water governance, the Council bridges the divide between multilateral environmental law and socioeconomic development. The Council oversees the implementation of the 2030 Agenda for Sustainable Development, conducting thematic reviews of Sustainable Development Goal 6 (Clean Water and Sanitation) and its interlinkages with SDG 13 (Climate Action), SDG 2 (Zero Hunger), and SDG 7 (Affordable Energy) through the annual High-Level Political Forum on Sustainable Development (HLPF).

6. The Council also coordinates the specialized work of the United Nations regional economic commissions, most notably the United Nations Economic Commission for Europe (UNECE), which serves as the legal and operational secretariat for the 1992 Water Convention. Under the Addis Ababa Action Agenda on Financing for Development, the Council is tasked with addressing systemic gaps in

international finance, making it the appropriate forum to review how international climate funds can support multi-country basin initiatives.

History of the agenda and previous United Nations decisions

7. International water law within the United Nations framework has evolved through several landmark conventions, declarations, and global conferences:

(a) The 1992 UNECE Convention on the Protection and Use of Transboundary Watercourses and International Lakes (Water Convention): Adopted in Helsinki and entering into force in 1996, the treaty was originally confined to the pan-European region. A 2003 amendment, which entered into force in 2013 and became operational globally in 2016, opened accession to all UN Member States. The Convention requires parties to prevent transboundary harm, exchange hydrological information, and establish joint river basin organizations. By October 2026, the Water Convention had reached 61 Parties, following accessions by Botswana, Jordan, Malawi, and Benin in 2026;

(b) The 1997 UN Convention on the Law of the Non-Navigational Uses of International Watercourses (UN Watercourses Convention): Adopted by the General Assembly and entering into force in 2014, this global framework codified customary international water law, establishing universal standards for equitable and reasonable utilization (Articles 5 and 6) and the obligation to prevent significant harm (Article 7);

(c) The 2008 UN International Law Commission Draft Articles on the Law of Transboundary Aquifers: Endorsed through General Assembly Resolution 63/124, the Draft Articles established principles for groundwater protection, recharge zone management, and scientific cooperation, though they remain non-binding;

(d) The 2023 UN Water Conference: Convened in New York, this was the first dedicated UN water conference since Mar del Plata in 1977. It produced the Water Action Agenda with over 700 voluntary commitments and formalized the Transboundary Water Cooperation Coalition to accelerate institutional cooperation;

(e) The upcoming 2026 UN Water Conference: Mandated by General Assembly Resolution 78/327, the conference will convene in Abu Dhabi on 8-10 December 2026, co-hosted by the United Arab Emirates and Senegal. Organized around six interactive dialogues, it aims to establish a concrete post-2030 implementation architecture for SDG 6;

(f) The 11th Meeting of the Parties (MOP11) to the Water Convention: Scheduled for 2027 in Senegal, marking the first time the triennial conference of the parties will take place on the African continent.

Organization and structure of the report

8. The present report is systematically structured to provide delegates with an integrated analytical and negotiating roadmap:

(a) Chapter 1 reviews the current state and global hydroclimatic baseline from 2023 to 2026, presenting a comparative model of riparian structural asymmetry, examining hotspot basins in the Nile, Mekong, and Lake Chad, and identifying operational security gaps;

(b) Chapter 2 evaluates institutional and legal challenges under climate stress, analyzing treaty rigidity, data fragmentation, dispute mechanisms, and case studies of the Indus and Nile basins;

(c) Chapter 3 examines financial mechanisms and source-to-sea governance, assessing adaptation finance gaps, blended finance, water funds,

debt conversions, and case studies of the Senegal, Lesotho Highlands, and Danube-Black Sea systems;

(d) Chapter 4 maps key stakeholders, detailing diverging interests among upstream, downstream, and coastal states, alongside non-state actors and structural lines of division;

(e) The Conclusion synthesizes core findings, presenting five actionable recommendations with implementation conditions, and providing a call to action;

(f) The Annex provides a reference table of statistical indicators, followed by References with the consolidated bibliography and then a technical Glossary.

Chapter 1. Current state and global hydroclimatic baseline

1.1. Dynamics of transboundary systems (2023-2026)

9. Between 2023 and 2026, global transboundary water systems experienced unprecedented environmental stress. The baseline assumption that natural water systems fluctuate within historically stable boundaries has collapsed. The physical network of transboundary waters comprises 310 international river basins and 468 identified transboundary aquifer systems, crossing the borders of 153 sovereign states. Together, these systems cover approximately 47% of the planet's ice-free land surface, contain roughly 60% of accessible global freshwater, and directly support over 40% of the world's population.

10. Data from the 2024 third reporting cycle for SDG Indicator 6.5.2, co-managed by UNECE and UNESCO, documents a persistent governance deficit. Across 117 countries where the indicator could be fully calculated, the global average of transboundary basin area covered by operational arrangements was 59%. However, this aggregate figure masks severe disparities. Only 43 out of 153 sharing states have operational arrangements covering 90% or more of their basin area, and only 26 states enjoy 100% operational coverage.

11. The institutional gap is most acute in transboundary groundwater. Less than 5% of transboundary aquifers worldwide are governed by formal, operational cross-border agreements, despite aquifers supplying more than 50% of municipal drinking water globally and providing the primary buffer against surface droughts.

1.2. Geographic mapping and high-risk hotspots

12. Transboundary river basins are frequently defined by structural riparian asymmetry, where upstream and downstream nations possess divergent physical leverage, socioeconomic priorities, and climatic vulnerabilities.

Table 1
Riparian structural asymmetry in high-risk basins

Basin / Region	*Upstream leverage and posture*	*Downstream vulnerability and claims*	*Key climate stressor (2023-2026)*
Nile Basin (Eastern and Northern Africa)	Ethiopia controls Blue Nile headwaters via GERD (5,150 MW); asserts equitable utilization under CFA.	Egypt relies on Nile for 97% of water; asserts historic volumetric quotas and prior consultation.	Multi-year drought risk; reservoir impoundment during low-rainfall periods threatening Lake Nasser.
Mekong Basin (Southeast Asia)	China manages Upper Lancang 11-dam cascade; controls sediment and dry-season baseflow.	Vietnam and Cambodia suffer delta salinity and fishery collapse; MRC lacks binding authority.	42% decline in Tonle Sap reverse flow; seawater intrusion 90 km inland damaging 100,000 ha of rice.
Lake Chad Basin (Sahelian Zone)	Upstream irrigation diversions in Cameroon and Chad reduce surface inflows.	Riparian populations across 4 states face displacement and fishery loss; unmonitored aquifer pumping.	Open water shrunk from 25,000 km² to 1,500-2,500 km²; 2.5 million displaced amid severe aridity.

1.2.1. The Nile River Basin (Eastern and Northern Africa)

13. The Eastern Nile represents a critical hydroclimatic friction zone. Upstream Ethiopia completed and formally inaugurated the Grand Ethiopian Renaissance Dam (GERD) on 9 September 2025, operating with an installed capacity of 5,150 megawatts. While the reservoir generates vital hydroelectric power for Ethiopia, its filling and operational regime have occurred without a binding trilateral agreement with downstream Sudan and Egypt.

14. Egypt relies on the Nile for approximately 97% of its renewable water supply, supporting an agricultural sector and population of over 105 million people. Downstream concerns focus on drought management: if multi-year dry periods occur, upstream retention without coordinated release rules risks curtailing water flows to Lake Nasser, threatening Egyptian municipal and agricultural security.

15. On 13 October 2024, the Nile Basin Cooperative Framework Agreement (CFA) officially entered into force after South Sudan deposited the sixth instrument of ratification, formally establishing the Nile River Basin Commission (NRBC). However, downstream Egypt and Sudan reject the CFA because Article 14(b) replaces historical colonial-era volumetric allocations (notably the 1959

treaty) with the principle of equitable utilization, entrenching a major diplomatic divide.

1.2.2. The Mekong River Basin (Southeast Asia)

16. The Mekong demonstrates the consequences of upstream dam construction on downstream ecological systems. Along the Upper Mekong (Lancang) in China, a cascade of eleven operational megadams controls upstream seasonal flows. Downstream, Laos, Thailand, Cambodia, and Vietnam depend on the natural flood pulse that historically drove regional fisheries and agricultural yields.

17. Hydroclimatic monitoring from 2023 to 2025 documented a 42% decline in the seasonal reverse-flow volume that feeds Cambodia's Tonle Sap Lake, reducing freshwater fish catches and threatening food security for two million riparian residents. In Vietnam's Mekong Delta, reduced dry-season river discharge has permitted saltwater from the South China Sea to penetrate up to 90 kilometers inland, salinizing over 100,000 hectares of rice paddies.

18. The Mekong River Commission (MRC), established by the 1995 Mekong Agreement between Cambodia, Laos, Thailand, and Vietnam, serves as a technical platform for joint monitoring and data exchange. However, China and Myanmar remain dialogue partners rather than full members, and the MRC lacks the legal authority to inspect upstream reservoirs or mandate minimum ecological flows.

1.2.3. The Lake Chad Basin (Sahelian zone)

19. The Lake Chad basin illustrates the compounding effect of climate stress, fragile governance, and groundwater depletion. Over the past six decades, the lake's open water surface contracted from 25,000 square kilometers in the 1960s to approximately 1,500 to 2,500 square kilometers today, driven by recurrent Sahelian droughts and uncoordinated irrigation withdrawals.

20. This environmental collapse has displaced over 2.5 million people across Cameroon, Chad, Niger, and Nigeria, undermining traditional fishing and pastoral livelihoods and enabling militant insurgencies. The Lake Chad Basin Commission (LCBC) has coordinated a regional stabilization strategy. However, the LCBC lacks hydrometric monitoring networks for the underlying Chad Basin and Maradi-Sokoto aquifer systems. As surface waters diminish, unmonitored groundwater extraction accelerates sub-surface depletion across borders. The cases suggest that institutional responses should reflect basin-specific conditions. Differences in participation, coordination, monitoring capacity and socioeconomic vulnerability may require distinct approaches rather than a uniform governance model.

1.3. Operational gaps in the security framework

21. Three structural deficiencies impede effective responses to climate volatility:

(a) Static volumetric allocations: Most historic water treaties allocate fixed volumes of water rather than dynamic percentage shares. When climate-driven droughts reduce total river discharge below treaty quotas, upstream states face an impossible choice between domestic shortages and treaty breach;

(b) Data fragmentation and monitoring deficits: Fewer than 30% of active river basin organizations operate real-time, automated hydrological data exchange networks. Hydroclimatic data is frequently classified as national security information, preventing timely flood warnings and joint drought mitigation;

(c) Absence of rapid dispute settlement mechanisms: Formal dispute procedures, such as recourse to the International Court of Justice (ICJ), re-

quire mutual state consent and take years to deliver judgments, while the UN Security Council rarely addresses water disputes until active violence breaks out. No international body exists to provide immediate, binding operational mediation during acute water emergencies.

Takeaway for the Committee: ECOSOC must guide Member States away from rigid volumetric water treaties toward dynamic, climate-responsive allocation formulas based on percentage shares and drought-indexed adjustments. The committee must overcome the chronic institutional neglect of transboundary aquifers by incorporating groundwater monitoring directly into river basin organization mandates. ECOSOC should also incentivize non-signatory states to accede to the 1992 and 1997 global water conventions to build consistent legal baselines.

Chapter 2. Institutional and legal problems in the climate crisis

2.1. Key trends

22. International water agreements were predominantly negotiated under the assumption of stable hydrology. While customary international law establishes general duties of equitable use and harm prevention, most existing treaties lack detailed mechanisms to adapt allocations to climate variability. Three trends characterize this institutional strain:

(a) Accelerating hydrological instability: Glacier retreat in the Himalayas and Andes, altered monsoon cycles, and more frequent flash floods are undermining the assumptions of fixed seasonal flows that underpin existing treaties;

(b) Incomplete institutional coverage: Over 40% of the world's transboundary basin area lacks operational institutional arrangements, leaving billions of people dependent on uncoordinated national water policies;

(c) Geopolitical securitization: As climate change intensifies water scarcity, states increasingly treat water infrastructure and hydrometric data through the lens of national defense rather than multilateral cooperation.

2.2. Current state of affairs

23. The global legal architecture rests on two complementary framework conventions: the 1992 UNECE Water Convention and the 1997 UN Watercourses Convention. While both establish core principles of equitable utilization, prevention of significant harm, and prior notification of planned measures, neither convention provides automatic enforcement or detailed, basin-specific operational rules.

24. As a result, transboundary governance relies on a patchwork of over 400 bilateral and regional treaties. Most of these agreements lack provisions for climate adaptation, extreme weather protocols, or groundwater management. Transboundary aquifers remain almost entirely unaddressed in binding international law, with the 2008 ILC Draft Articles serving only as voluntary guidance.

2.3. Causes and consequences

25. Four structural weaknesses undermine treaty stability during climate stress:

(a) Inflexible allocation formulas: Fixed volumetric extractions prevent equitable sharing when river discharge drops during multi-year droughts;

(b) Missing emergency thresholds: Few agreements define objective, measurable triggers for drought emergencies, resulting in political finger-pointing when flows decline;

(c) Disconnected dispute mechanisms: Formal arbitration and litigation are too slow for real-time hydrological crises, creating a need for interim technical fact-finding;

(d) Data mistrust: The absence of standardized hydrometric protocols allows riparian states to dispute baseline flow data and dam storage figures.

26. These weaknesses produce unilateral infrastructure operations, severe downstream economic losses, and diplomatic standoffs that complicate broader regional cooperation.

2.4. Existing measures and limitations

27. The UNECE Water Convention provides practical tools, including a dedicated Implementation Committee, regular reporting under SDG Indicator 6.5.2, and guidance on climate adaptation strategies. However, its effectiveness depends entirely on voluntary national implementation and political will.

28. River Basin Organisations support technical planning and scientific exchange, but most lack statutory enforcement authority. While treaty review clauses exist in some modern agreements, renegotiating established water rights is politically contentious and often stalled by domestic interest groups.

2.5. Case studies

2.5.1. Indus Basin (India-Pakistan)

29. The 1960 Indus Waters Treaty, mediated by the World Bank, survived three major wars between India and Pakistan by dividing the basin's rivers: the Eastern rivers (Sutlej, Beas, Ravi) were allocated to India, and the Western rivers (Indus, Jhelum, Chenab) were allocated to Pakistan, subject to restricted Indian run-of-river hydroelectric uses.

30. However, the treaty lacks provisions for climate change, glacier retreat, or joint basin-wide ecological management. Tensions over Indian hydropower projects (Kishanganga and Ratle) led to parallel proceedings at the Permanent Court of Arbitration and before a World Bank Neutral Expert. The crisis reached an unprecedented escalation on 22 April 2025, when India placed the Indus Waters Treaty in abeyance following a militant attack in Pahalgam. Pakistan rejected the suspension as a violation of international law. This dispute illustrates the fragility of historic treaties that lack climate-adaptive clauses when compounded by geopolitical hostility.

2.5.2. Nile Basin (GERD)

31. The inauguration of GERD on 9 September 2025 marked the realization of Africa's largest hydropower facility, with a storage capacity of 74 billion cubic meters. Yet fifteen years of diplomatic negotiations between Ethiopia, Sudan, and Egypt have failed to produce a legally binding agreement on long-term drought operations, data exchange, and dispute settlement.

32. With the entry into force of the Cooperative Framework Agreement on 13 October 2024 and the establishment of the Nile River Basin Commission, upstream states have formalized a multilateral governance regime based on equitable utilization. However, the refusal of Egypt and Sudan to participate leaves the basin divided into opposing legal camps, demonstrating that infrastructure completion without inclusive operational protocols heightens systemic geopolitical vulnerability.

Takeaway for the Committee: Delegates should advocate for the modernization of transboundary treaties through the mandatory inclusion of dynamic allocation rules, objective drought triggers, and periodic review mechanisms. ECOSOC should encourage Member States to establish independent technical fact-finding bodies and automated data-sharing systems to prevent hydrologic anomalies from escalating into diplomatic crises.

Chapter 3. Financial mechanisms and source-to-sea integration

3.1. Key trends

33. Money is now the primary bottleneck in transboundary water cooperation. According to UNEP's Adaptation Gap Report 2024, developing countries require between US$215 billion and US$387 billion per year for climate adaptation during this decade. In contrast, international public adaptation finance flows to developing countries reached only US$27.5 billion in 2022, leaving an annual adaptation finance gap of US$187 to 360 billion. Even if donor nations meet the Glasgow COP26 commitment to double adaptation finance from 2019 levels by 2025, the gap would contract by only about 5%. Furthermore, adaptation flows remain volatile, having contracted by 15% to US$21 billion in 2021 before recovering.

34. The updated 2025 UNEP report, Running on Empty, projects that adaptation needs will climb to US$310 billion annually by 2035 based on modelled costs, and US$365 billion based on national adaptation plans and climate pledges. The Global Commission on the Economics of Water (GCEW, October 2024) demonstrates that delay will prove catastrophic: a destabilized water cycle risks shrinking GDP by 8% on average across high-income economies by 2050, and by 10 to 15% in lower-income economies. The Commission highlights that water is underpriced almost universally, which encourages industrial and agricultural waste while starving public water systems of capital. Furthermore, rain-fed farming accounts for 80% of global cropland and produces over half of the world's food, ensuring that hydrological volatility directly threatens global food security.

35. In response, international financing is gradually evolving from single-purpose dams and municipal pipes toward integrated basin portfolios, upstream-

downstream benefit-sharing, blended finance, and payments for ecosystem services. Source-to-sea governance links these efforts by treating terrestrial headwaters, rivers, aquifers, deltas, and coastal marine zones as an interconnected hydrological corridor requiring unified investment.

3.2. Current state of affairs

36. Water finance remains fragmented across national ministries, bilateral aid programs, environmental funds, and multilateral loans. Three multilateral channels dominate:

(a) The Green Climate Fund (GCF) targets a 50:50 allocation between climate mitigation and adaptation, with a mandatory floor reserving 50% of adaptation resources for least developed countries, small island developing states, and African nations. Transboundary water projects fall within its health, food, and water security funding area;

(b) The Global Environment Facility (GEF) International Waters focal area constitutes the world's largest dedicated funding mechanism for multi-country freshwater and marine collaboration. Working through implementing agencies, UNEP has managed over 80 GEF International Waters projects in 75 countries, with 44 active projects across 89 countries today. However, an independent evaluation published by the GEF Independent Evaluation Office in February 2026 revealed critical systemic weaknesses: transboundary mandates are often diluted within broad regional programs, long-term financial sustainability planning is frequently absent, and socioeconomic co-benefits are poorly monitored;

(c) The Adaptation Fund maintains a regional funding window offering up to US$30 million per project, alongside a country cap of US$40 million. In June 2026, the Fund approved a US$30 million regional programme imple-

mented by UNDP to enhance water security across Eswatini, Zambia, and Zimbabwe.

37. Despite these channels, transboundary projects face severe administrative hurdles. They require multi-state coordination, separate accreditation, and lengthy approval timelines. Most river basin organizations lack the legal personality or statutory borrowing power to contract loans or receive grants directly. The Mekong River Commission, for example, relies entirely on annual member-state contributions supplemented by external development partner grants.

38. Source-to-sea implementation suffers from institutional fragmentation between inland water authorities, agricultural agencies, and marine fisheries departments. Approximately 80% of marine pollution originates on land, and over 11 million tonnes of plastics enter marine waters each year, demonstrating that coastal health is dictated by upstream watershed management.

3.3. Causes and consequences

39. Four structural causes explain the deficit in transboundary water investment:

(a) Sovereign bias in climate finance: Multilateral funds accredit national agencies and track outcomes within sovereign borders, making multi-state basin projects appear administratively complex and financially risky;

(b) Narrow legal mandates of RBOs: Few basin commissions possess the legal personality to borrow capital, hold infrastructure assets, or sign binding financing agreements;

(c) Budgetary fragmentation: Water-related spending is dispersed across separate agriculture, energy, municipal supply, and disaster-relief budgets, preventing coherent capital allocation;

(d) Misalignment of private capital: Private investors prioritize bankable, revenue-generating assets such as hydropower, bulk water supply, and industrial desalination, while avoiding non-revenue public goods like hydrometric monitoring networks, flood retention basins, and wetland conservation.

40. These constraints delay climate-resilient infrastructure. Riparian states frequently bypass joint planning to pursue unilateral national projects, escalating diplomatic friction with neighbors. Downstream deltas, fisheries, and coastal communities suffer the consequences through reduced silt deposition, coastal erosion, and saltwater intrusion, while lacking a formal voice in upstream financing decisions.

3.4. Existing measures and limitations

41. Blended finance uses concessional public funds or philanthropic guarantees to de-risk private investment. Data from Convergence reveals that only 28 blended finance transactions have closed in the water and sanitation sector, with an aggregate value of US$2.1 billion. More than half of these transactions focus narrowly on municipal water supply, predominantly in South Asia. The average transaction size is US$76 million, compared to a cross-sector blended finance average of US$390 million. While public-private partnerships succeed where user fees can be collected, they cannot fund transboundary flood protection or watershed conservation.

42. Payments for ecosystem services (PES) and water funds channel financial transfers from downstream municipal and industrial beneficiaries to upstream communities that protect catchments. The Fund for the Protection of Water (FONAG) in Quito, Ecuador, operating as a private trust since 2000, covers the upper Guayllabamba basin. FONAG has placed over 20,000 hectares under conservation and restored more than 13,000 hectares of high-altitude paramos, financed by a mandatory 2% contribution from the municipal water utility's billing

revenue. However, transboundary replication is hindered by the absence of cross-border legal trusts and enforceable payment compacts.

43. Debt-for-nature swaps allow debt-distressed nations to refinance sovereign obligations in exchange for conservation investments. In November 2021, Belize repurchased its US$553 million commercial superbond at a 45% discount through a US$364 million blue loan arranged by The Nature Conservancy and Credit Suisse, backed by political risk insurance from the US International Development Finance Corporation (DFC). The transaction reduced public debt by 12% of GDP and directed approximately US$180 million to marine conservation over 20 years. Similarly, in May 2023, Ecuador completed a debt conversion exchanging US$1.628 billion of sovereign bonds for a US$656 million loan backed by DFC insurance and an US$85 million Inter-American Development Bank guarantee, unlocking more than US$450 million for the Galapagos Islands.

44. These debt swaps focus exclusively on marine reserves. A marine protection pledge does not create a transboundary river-to-sea financing mechanism. Furthermore, debt swaps remain complex, one-off arrangements with high transaction costs, offering limited scalability for transboundary river basins.

3.5. Case studies

3.5.1. Senegal River (OMVS)

45. Founded in 1972 by Mali, Mauritania, and Senegal, with Guinea joining in 2006, OMVS manages a basin of 300,000 square kilometers supporting over two million people. OMVS represents the gold standard of transboundary asset co-ownership. Member states jointly own all major infrastructure: the Diama salt-barrier dam (completed in 1986, operated by the joint company SOGED) and the Manantali hydroelectric dam (completed in 1988 on the Bafing River in Mali, with a 200 MW plant added in 2002 providing 800 GWh annually, operated by SOGEM).

46. Because assets are indivisible and operating costs are shared according to the proportion of benefits received in irrigation, energy, and navigation, OMVS has mobilized commercial and concessional financing that no member state could secure independently. The limitation of the model is its high demand for political integration and institutional trust, which has proven difficult to replicate in less cohesive basins.

3.5.2. Lesotho Highlands Water Project (LHWP)

47. Established by the 1986 Treaty between Lesotho and South Africa, supplemented by a 2011 agreement for Phase II, LHWP transfers pristine mountain water from Lesotho to South Africa's industrial heartland in Gauteng, while generating hydropower and sovereign royalty revenue for Lesotho. Phase II raises annual water transfers from 780 to 1,260 million cubic meters at an appraised cost of ZAR 32.56 billion, funded by South Africa with loans from the African Development Bank (ZAR 1.3 billion) and the New Development Bank (ZAR 3.2 billion).

48. The project illustrates the power of economic compensation to align upstream and downstream interests. However, rigid contractual formulas have created friction during execution. In May 2025, South Africa's parliamentary briefing confirmed that delays in constructing the Polihali Dam, now postponed to 2029, forced a renegotiation of monthly royalties to M298 million (approximately R300 million) to compensate Lesotho for delayed water volumes, while overall Phase II costs surged from R8 billion to over R53 billion. The case highlights that long-term cross-border infrastructure treaties must include flexible, pre-agreed indexation and risk-sharing formulas.

3.5.3. Danube River and Black Sea Strategic Partnership

49. Cooperation between the International Commission for the Protection of the Danube River (ICPDR) and the Black Sea Commission (ICPBS), formalized through a joint memorandum of understanding on 26 November 2001, exemplifies

effective source-to-sea coordination. A Joint Technical Working Group coordinates nutrient pollution reduction across nineteen countries.

50. Nutrient over-enrichment that caused massive hypoxic dead zones in the Black Sea during the 1980s has dropped significantly, with phosphorus discharges falling 30 to 50% below peak levels. While this recovery was aided by economic restructuring in Eastern Europe and the implementation of the EU Urban Waste Water Treatment Directive, coordinated basin-wide emissions standards and synchronized monitoring provided the institutional framework for sustained recovery.

Takeaway for the Committee: ECOSOC should urge multilateral climate funds and multilateral development banks to create dedicated regional transboundary financing windows that allow accredited river basin organizations to receive project grants and concessional loans directly. Member States should establish joint benefit-sharing frameworks and transboundary water funds that compensate upstream watershed conservation while protecting downstream coastal economies. Source-to-sea governance must be institutionalized through unified hydrometric, sediment, and water quality indicators linking inland basin commissions with marine environmental authorities.

Chapter 4. Key stakeholders and strategic divergences

51. International transboundary water diplomacy is governed by structural power dynamics rather than abstract legal consensus. Reaching negotiated resolutions in the Economic and Social Council requires delegates to navigate the competing priorities of state coalitions and non-state actors along the river corridor.

4.1. State coalitions and strategic interests

(a) Upstream Riparian States (e.g., Ethiopia, China, India, Turkey, Guinea, Kyrgyzstan, Tajikistan): These states exercise physical control over headwaters, glacial melt, and dam reservoirs. Their core objective is asserting sovereign control over resource development, prioritizing hydroelectric generation, industrial growth, and irrigation. They invoke the principle of territorial sovereignty (the historical Harmon Doctrine) and consistently resist downstream veto powers, mandatory prior approval, or rigid volumetric release schedules;

(b) Downstream Riparian States (e.g., Egypt, Vietnam, Pakistan, Iraq, Uzbekistan, Senegal): Highly exposed to flow manipulation and upstream extraction, downstream nations prioritize historical acquired rights (prior appropriation), guaranteed minimum seasonal baseflows, and strict enforcement of the obligation not to cause significant harm. They demand mandatory prior notification, joint environmental impact assessments, and binding dispute settlement mechanisms to protect municipal water supplies and agricultural stability;

(c) Coastal, Deltaic, and Small Island Developing States (e.g., Bangladesh, Vietnam, SIDS): Located at the terminus of hydrological corridors,

these states face compounding vulnerabilities from upstream sediment starvation, riverine pollution, and sea-level rise. Their primary interest lies in preserving sediment transport to prevent delta subsidence, halting seawater intrusion into coastal aquifers, and establishing legal liability for upstream land-based pollution under source-to-sea frameworks.

4.2. Non-state actors

(a) River Basin Organisations (RBOs): Entities such as the Mekong River Commission, the Niger Basin Authority, and OMVS serve as technical facilitators for data exchange and joint river planning. However, their capacity is chronically restricted by member-state funding arrears, narrow advisory mandates, and the lack of independent legal personality required to contract financing directly from international climate funds;

(b) Multilateral Development Banks and Climate Funds: Institutions including the World Bank, the African Development Bank, the Green Climate Fund, and the Global Environment Facility provide vital capital for water infrastructure. However, their operations remain constrained by sovereign lending policies, fiduciary risk aversion, and complex multi-jurisdictional compliance requirements that deter multi-country transboundary programs;

(c) Private Investors and Hydropower Developers: Commercial capital seeks bankable, revenue-generating projects supported by long-term Power Purchase Agreements (PPAs) and government guarantees. Private developers frequently ignore basin-wide ecological externalities, seasonal flood-pulse requirements, and downstream social impacts unless compelled by binding national regulations;

(d) Local Communities, Smallholder Farmers, and Indigenous Peoples: Riparian populations, pastoralists, and smallholder irrigators depend directly on healthy freshwater ecosystems and natural seasonal flood pulses. They bear the immediate costs of unannounced reservoir releases, salinity intrusion, and fishery collapses, yet they are systematically excluded from high-level inter-state diplomatic negotiations.

4.3. Critical lines of divergence

52. Transboundary water negotiations are divided by four core structural fault lines:

(a) Absolute sovereignty versus equitable utilization: Upstream assertions of unfettered domestic resource rights clash directly with downstream demands for guaranteed historic water quotas and the no-harm rule;

(b) National security data secrecy versus open transparency: Riparian governments frequently classify hydrometric, meteorological, and reservoir storage data as state secrets, preventing the establishment of transparent, real-time basin monitoring networks;

(c) Sovereign national funding versus multi-country basin finance: International financial institutions and finance ministries remain structured around single-country sovereign loans, creating severe administrative resistance to funding multi-state transboundary initiatives;

(d) Immediate economic exploitation versus source-to-sea ecological integrity: Upstream priorities for rapid hydropower and agricultural revenues conflict with the long-term need to maintain river connectivity, sediment flows, and coastal delta survival.

Despite differing positions on sovereignty, allocation and financing, States may share practical interests in flood forecasting, drought preparedness, pollution prevention and hydrological data exchange. Advancing cooperation in these areas could help maintain dialogue while broader political disagreements remain unresolved.

Takeaway for the Committee: ECOSOC must guide negotiations away from zero-sum volumetric disputes toward multi-sector benefit-sharing. By coupling upstream hydropower production with downstream energy markets, agricultural optimization, and flood protection, the committee can help Member States transform regional tensions into mutual economic gains.

Conclusion

53. This report demonstrates that the international governance of transboundary waters faces an unprecedented structural test. The physical assumptions that underpinned twentieth-century water treaties have dissolved under accelerating hydroclimatic volatility. As documented in Chapter 1, acute droughts and intense floods across the Nile, Mekong, and Lake Chad basins have revealed the fragility of static water quotas. Chapter 2 detailed the legal bottlenecks that paralyze cooperation: inflexible treaties, missing drought thresholds, slow dispute resolution, and fragmented hydrometric data. Chapter 3 highlighted that finance constitutes the second broken link, with an annual adaptation finance gap of US$187 to 360 billion, systemic barriers to basin-level funding, and severe neglect of source-to-sea corridors. Chapter 4 mapped the deep political fault lines dividing upstream, downstream, and coastal states.

54. The institutional baseline underscores the urgency of multilateral reform. Across 117 reporting countries in 2024, the global average value for SDG Indicator 6.5.2 reached only 59%, with just 26 out of 153 sharing states enjoying complete operational coverage across all their shared basins. While the 1992 Water Convention has expanded to 61 Parties as of October 2026, following accessions by Botswana, Jordan, Malawi, and Benin, the 1997 Watercourses Convention maintains a narrower base, and the world's 468 transboundary aquifers remain almost entirely outside binding international agreements.

Actionable recommendations and conditions for implementation

55. To bridge these institutional, legal, and financial divides, the Group of Experts recommends that the Economic and Social Council, within its mandate and as appropriate, propose the following policy measures:

(a) Transition to dynamic allocation rules and climate emergency protocols: Member States should amend existing basin agreements to replace rigid volumetric quotas with dynamic, percentage-based allocations indexed to real-time hydrologic discharge and pre-negotiated drought-sharing tiers. Condition: Parties must establish automated, real-time hydrometric and dam operational data sharing through standardized digital platforms, as dynamic allocation cannot function without shared empirical baselines;

(b) Establish dedicated transboundary financing windows: Multilateral climate funds, specifically the Green Climate Fund, Global Environment Facility, and Adaptation Fund, should create dedicated financing windows that allow accredited river basin organizations to receive project grants and concessional loans directly. Condition: Recipient river basin organizations must possess recognized international legal personality, certified transparent financial auditing, and accredited environmental and social safeguards;

(c) Institutionalize transboundary benefit-sharing and water funds: Riparian governments should establish cross-border payments for ecosystem services and water funds, enabling downstream economic beneficiaries to co-finance upstream catchment protection and reforestation. Condition: Fund governance and monitoring must be supervised by independent multi-stakeholder boards that include verified representation from local communities, smallholder farmers, and indigenous peoples;

(d) Mainstream source-to-sea governance demonstration corridors: UN regional economic commissions and specialized agencies should establish transboundary source-to-sea demonstration programs connecting inland river basin commissions with marine and coastal protection authorities. Condition: Participating states must adopt a unified set of harmonized indicators measur-

ing sediment transport, riverine nutrient pollution, and coastal salinity intrusion across the full terrestrial-to-marine corridor;

(e) Universalize global water conventions and codify transboundary groundwater: UN Member States should accelerate accession to both the 1992 Water Convention and the 1997 Watercourses Convention, while adopting binding annexes for transboundary aquifers based on the 2008 ILC Draft Articles. Condition: Accession programs must be coupled with institutional and technical capacity-building initiatives funded through UNECE, UNESCO, and UN-Water to ensure formal legal commitments translate into operational joint bodies.

Action to be taken by the Economic and Social Council

56. The timeline for decisive multilateral action is defined by critical diplomatic milestones. Delegates of the Economic and Social Council at HSEMUN-27 possess the mandate to draft a transformative resolution establishing the Framework for Transboundary Climate Resilience. This resolution should serve as an operational contribution to the 2026 United Nations Water Conference in Abu Dhabi (8-10 December 2026, co-hosted by the United Arab Emirates and Senegal) and lay the groundwork for the 11th Meeting of the Parties to the Water Convention in Senegal in 2027.

57. Within its mandate, the Economic and Social Council may contribute to these efforts by supporting coordination, facilitating the exchange of experience and promoting consideration of implementation challenges across relevant areas of the United Nations system. Progress should be assessed not solely by the adoption of agreements or the establishment of institutions, but also by whether these arrangements strengthen the capacity of participating States and relevant bodies to address shared water-related risks. A sustained focus on practical imple-

mentation, evidence-based assessment and context-sensitive cooperation may help advance more effective and equitable governance of transboundary water resources in the context of climate change.

58. Rivers, lakes, and aquifers ignore political boundaries; multilateral governance must now evolve to reflect their physical indivisibility. By aligning legal flexibility, direct basin financing, and source-to-sea coordination, the Economic and Social Council can ensure that transboundary waters become catalysts for regional peace, economic stability, and shared climate resilience.

Annex. Comparative statistical indicators by basin and region

Table A.1

Key transboundary water governance indicators (Formula: Value + Year + Scope + Source)

Indicator / Basin	*Value*	*Scope / Sample and Year*	*Official primary source*
Global SDG 6.5.2 Average Coverage	59%	117 reporting countries (2024)	UNECE / UNESCO 3rd Progress Report (2024)
States with 100% Basin Coverage	26 states	153 UN Member States sharing basins (2024)	UNECE / UNESCO 3rd Progress Report (2024)
States with >90% Basin Coverage	43 states	153 UN Member States sharing basins (2024)	UNECE / UNESCO 3rd Progress Report (2024)
Transboundary Aquifers Covered	<5%	468 identified transboundary aquifers (2024)	UNECE / UNESCO / UN-Water (2024)
Annual Adaptation Finance Needs	US$215-387 bn / yr	Developing countries, 2020-2030 decade (2024)	UNEP Adaptation Gap Report 2024, Fig. ES.4
Public Adaptation Finance Flows	US$27.5 bn	International public flows to developing countries (2022)	UNEP Adaptation Gap Report 2024, Fig. ES.4
Annual Adaptation Finance Gap	US$187-360 bn / yr	Developing countries (2022 baseline)	UNEP Adaptation Gap Report 2024
Projected Adaptation Needs by 2035	US$310-365 bn / yr	Modelled costs & NDCs/ NAPs, developing nations (2025)	UNEP Adaptation Gap Report 2025: Running on Empty
Economic Cost of Water Inaction by 2050	8% GDP loss (high-income) 10-15% loss (low-income)	Global macroeconomic projection (2024)	Global Commission on the Economics of Water (2024)
Land-Based Origin of Marine Pollution	80%	Global marine environment (2026)	UNEP Source-to-Sea Analysis (Aug 2026)
Tonle Sap Reverse Flow Decline	42% reduction	Tonle Sap Lake, Cambodia (2023-2025 assessment)	Mekong River Commission assessments (2025)
Mekong Delta Seawater Intrusion	90 km inland; 100,000+ ha damaged	Vietnam Mekong Delta dry seasons (2024-2025)	Mekong River Commission (2025)
Lake Chad Surface Contraction	Contracted to 1,500-2,500 km²; 2.5M displaced	Lake Chad Basin across 4 states (1960s vs 2024)	LCBC / UN-Water Country Brief (2024)
Blended Finance in Water & Sanitation	28 transactions; US$2.1 bn total	Global blended finance transactions (2024)	Convergence Data Brief (2024)

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Glossary

Conjunctive water management: Coordinated, combined management of surface water and groundwater resources within a basin to maximize yield and buffer against climate drought.

Cooperative Framework Agreement (CFA): Multilateral treaty negotiated by Nile Basin riparians that entered into force on 13 October 2024, establishing the Nile River Basin Commission based on equitable utilization.

Dynamic water allocation: Water-sharing mechanism that allocates variable percentage shares of actual seasonal runoff rather than fixed annual volumetric quotas, automatically adjusting to droughts and floods.

Equitable and reasonable utilization: Foundational customary principle of international water law (Articles 5-6 of 1997 UN Watercourses Convention) requiring riparians to balance socioeconomic needs, population dependence, and availability without causing harm.

Global Commission on the Economics of Water (GCEW): Independent international commission that released its landmark report in October 2024 examining the systemic economic risks of the global water crisis.

Green Climate Fund (GCF): Multilateral fund under the UNFCCC maintaining a 50:50 adaptation-mitigation balance and funding transboundary water resilience under its health, food, and water security area.

Hydroclimatic stationarity: The foundational engineering and legal principle that natural water fluctuations stay within historically stable, predictable statistical bounds; now rendered obsolete by climate change.

No-harm rule (Obligation to prevent significant harm): Core principle (Article 7 of 1997 Convention) requiring states to take all appropriate measures to prevent significant transboundary damage to other riparians.

Payments for ecosystem services (PES) / Water funds: Financial arrangements where downstream water users pay upstream land and water stewards to protect watershed forests, paramos, and recharge zones.

Prior notification and consultation: Procedural requirement in international water law obligating riparians to inform co-basin states before implementing infrastructure projects that may cause significant transboundary impacts.

Riparian structural asymmetry: Geopolitical and ecological imbalance where upstream states hold infrastructure and flow control, while downstream states suffer accumulated hydrological and economic vulnerabilities.

River Basin Organisation (RBO): Joint institutional entity established by riparian states to coordinate monitoring, water management, infrastructure development, and dispute prevention within a shared basin.

SDG indicator 6.5.2: Global indicator tracking the proportion of transboundary basin area covered by operational cooperation arrangements, co-custodied by UNECE and UNESCO.

Source-to-sea (S2S) governance: Holistic management approach linking land, freshwater rivers, aquifers, deltas, estuaries, and coastal marine environments into a single continuous hydrological system.

UNECE 1992 Water Convention: Convention on the Protection and Use of Transboundary Watercourses and International Lakes; globalized treaty requiring joint bodies and transboundary harm prevention; 61 Parties as of October 2026.

UN 1997 Watercourses Convention: Convention on the Law of the Non-Navigational Uses of International Watercourses; universal legal framework convention codifying equitable utilization and the no-harm rule.

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