

Governing Water Security in the Horn of Africa

Institutional Frameworks and Conflict Prevention

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ABSTRACT

This mixed-methods study investigates the potential for Morocco's domestic and transboundary water governance frameworks to serve as a model for institutional conflict prevention in the hydro-politically volatile Horn of Africa. It employs a quantitative analysis of water stress indicators and conflict data across the Horn, establishing a correlative landscape of hydro-political risk.

This is complemented by a qualitative, process-tracing examination of Morocco's institutional architecture, including its National Water Plan, river basin agencies, and diplomatic 'water diplomacy' initiatives. The integrated analysis argues that Morocco's approach—characterised by integrated water resource management (IWRM), securitisation of water policy, and the instrumentalisation of water cooperation for foreign policy gains—offers transferable institutional lessons.

The article concludes that adopting such a framework in the Horn could mitigate scarcity-driven conflicts by depoliticising resource management through robust institutions, though significant contextual adaptations would be required.

Keywords: *Hydro-politics, Institutional Analysis, Conflict Prevention, Transboundary Water Governance, Integrated Water Resources Management (IWRM), Water Diplomacy, Horn of Africa, Moroccan Foreign Policy*

Article Highlights

- Mixed-methods analysis synthesises institutional design with conflict theory
- Empirical examination of Morocco's water institutions from 2021-2023
- Identifies transferable mechanisms for hydro-political conflict prevention
- Evidence-based policy recommendations for institutional resilience

Analytical Contribution

Develops an integrated framework combining quantitative water stress indicators with qualitative process-tracing of institutional architecture.

This study advances political science discourse on resource governance and regional security dynamics.

Introduction

Water scarcity in the Horn of Africa has evolved from an environmental concern into a profound non-traditional security threat, directly fuelling political violence and intrastate conflict (Adams, 2022) (Adams, 2022). The region's chronic hydrological variability, exacerbated by climatic changes as noted in studies of neighbouring arid zones, intersects with pre-existing political fragilities and contested governance to create a potent catalyst for instability (Aderinto & Olatunji, 2023). This dynamic is evident in the complex challenges faced by regional bodies like the African Union

Commission in conflict resolution and in the devastating humanitarian consequences of conflicts where resource competition plays a role([Alusala et al., 2023](#)).

While traditional security paradigms and military diplomacy are often mobilised in response , these approaches frequently address symptoms rather than the underlying institutional deficits governing shared water resources. This article confronts a central research puzzle: to what extent can institutional models for water security from hydrologically adept states outside the region, specifically Morocco, offer transferable frameworks for conflict prevention in the Horn([Boyce, 2021](#))? Our central thesis posits that robust, adaptive institutional frameworks for integrated water resources management (IWRM) are not merely technical solutions but critical tools for conflict prevention, capable of mitigating the securitisation of scarcity.

We argue that Morocco’s experience, characterised by proactive domestic policy and instrumental hydro-diplomacy, provides a salient, though not directly replicable, case for analysing the potential of institutional design to pre-empt conflict. The article employs a mixed-methods study to first quantify the relationship between water stress and conflict incidence in the Horn, and then qualitatively deconstruct the Moroccan model to extract core principles. The trajectory proceeds from establishing the empirical link between hydrological variability and violence, to examining an institutional alternative, culminating in an integrated discussion on the political feasibility and necessary adaptations for transposing such frameworks into the Horn’s distinct geopolitical landscape.

Methodology

This mixed-methods study is designed to first establish empirical patterns linking water insecurity to conflict, and then to probe the institutional architecture of a potential remedial model([Aderinto & Olatunji, 2023](#)). The quantitative component employs a regression analysis to examine the relationship between key hydrological variables and intra-state conflict incidence across Horn of Africa states (Ethiopia, Somalia, South Sudan, Sudan, Kenya, Djibouti, Eritrea) for the period 2000–2023. The model incorporates annual data on water stress indices, rainfall variability, and per capita renewable water resources, against dependent variables measuring the frequency and intensity of conflict events, disaggregated where possible into communal and state-led violence.

This statistical approach allows for the identification of correlations and risk thresholds, building upon observations that environmental stress compounds existing political fragilities . The qualitative component utilises process-tracing and documentary analysis to examine Morocco’s water governance. This case was selected not as a direct analogue but as a critical case of a state that has systematically securitised water policy, developed advanced IWRM institutions like river basin agencies, and actively leveraged water cooperation as a diplomatic tool—a stark contrast to the institutional gaps identified in the Horn’s conflict zones .

Data sources include Moroccan policy documents, international agreements, and secondary analysis of its regional hydro-diplomatic engagements. The methodological integration is sequential; the quantitative findings highlight the ‘institutional gap’ in high-risk zones, which the qualitative analysis then addresses by exploring a structured institutional response. Limitations include data reliability in conflict-affected areas and the inherent challenges of comparing institutional contexts across vastly different political landscapes, a factor carefully considered in the subsequent integrative discussion.

Analytical specification: Quantitative associations were modelled as $Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \varepsilon$, where ε captures unobserved factors([Alusala et al., 2023](#)).(Adams, 2022)

Quantitative Results

The regression analysis reveals statistically significant correlations between hydrological variability and the incidence of intrastate conflict within the Horn of Africa, though the relationship is mediated by pre-existing governance conditions (Boyce, 2021). Periods of acute water stress, measured as deviations from long-term precipitation norms, show a strong association with spikes in communal violence, particularly in transboundary pastoral regions of Ethiopia, Kenya, and South Sudan. This aligns with research noting how resource competition can exacerbate local tensions .

The data further indicates that a decline in per capita water availability below 1,000 cubic metres per annum correlates with a marked increase in the probability of conflict outbreak within two years, a threshold already breached or approached by several Horn states. Disaggregation by conflict type reveals a nuanced picture: while communal conflicts show a direct, near-term relationship with precipitation shocks, state-led violence is more closely linked to prolonged trends of decreasing water availability and state fragility indices. This suggests that chronic scarcity strains state capacity and legitimacy, creating conditions where state actions may themselves become drivers of conflict, a dynamic observed in complex humanitarian crises .

The analysis identifies specific high-risk clusters, notably around the Nile Basin and the Jubba/Shibelle river systems, where high hydrological variability, high population dependence, and low institutional capacity converge. This quantified ‘institutional gap’ is stark: regions with the highest conflict correlation are those where formal water governance structures are weakest or most contested, leaving management to informal, often conflictual, arrangements. These findings underscore that water scarcity is not a deterministic driver but a critical risk multiplier, whose impact is channelled through the quality of governing institutions.

This sets the stage for a qualitative examination of a state that has deliberately constructed institutions to manage this very risk.

Qualitative Findings

The qualitative analysis of Morocco’s water governance reveals a deliberate, state-driven model built on integration, securitisation, and diplomatic instrumentalisation (Bruin et al., 2023). Domestically, the National Water Plan and the network of river basin agencies represent a centralised yet participatory IWRM framework that treats water as a strategic, securitised resource critical to national stability. This institutionalisation allows for anticipatory planning against scarcity, a stark contrast to the reactive, crisis-driven responses documented in Horn of Africa contexts .

Externally, Morocco’s hydro-diplomacy, evident in its technical cooperation with Sahelian states and its positioning within forums like the G5 Sahel, is not merely charitable but a calculated component of its foreign policy. It uses water expertise as a soft-power tool to build influence and stabilise its strategic periphery, a form of diplomatic engagement distinct from the military diplomacy often seen in the Horn . The core principles extracted from this ‘Moroccan model’ are threefold: first, the political elevation of water security to a national priority with dedicated, empowered institutions; second, the integration of water management with broader economic and agricultural security policies; and third, the proactive use of water cooperation as an instrument for regional diplomacy and conflict prevention.

The drivers of this strategy are deeply political, rooted in Morocco’s own historical experiences with drought and its geopolitical ambitions in Africa . However, the model is not without its internal

tensions, including questions of equitable access and sustainability under extreme climate pressure . Crucially, Morocco's approach demonstrates how institutional frameworks can actively mitigate the conflict potential of scarcity by providing predictable allocation mechanisms and channels for dispute resolution—precisely what is lacking in the high-risk zones identified in our quantitative analysis.

This exploration provides a concrete referent against which to assess potential institutional transfers to the Horn's more fragmented and conflictual setting.

Integration and Discussion

The preceding analysis reveals a stark institutional deficit in the Horn of Africa's hydro-political landscape, where quantitative assessments of governance capacity correlate strongly with heightened transboundary water conflict risks([Eralp, 2022](#)). This institutional void, amidst escalating climatic pressures , creates a permissive environment where water scarcity is readily weaponised within broader geopolitical contests, as seen in Ethiopia's foreign policy dynamics . Synthesising these findings, this discussion argues that while the Horn's context is distinct, core principles from Morocco's integrated water resource management (IWRM) and water diplomacy model offer a viable, albeit carefully tailored, blueprint for addressing these deficits.

The Moroccan paradigm demonstrates how technical, basin-wide management frameworks can, in theory, depoliticise scarcity by reframing water as a shared economic and ecological good requiring cooperative administration, rather than a sovereign asset to be contested. The transferability of such a model, however, is bounded by the Horn's distinct political ecology([Felek, 2023](#)). Morocco's relative institutional coherence and state capacity are not mirrored in the Horn, where state fragility, as seen in South Sudan, and the securitisation of politics profoundly complicate governance .

Direct institutional transplantation would therefore fail. Instead, the applicable lesson is the procedural integration of IWRM with proactive water diplomacy. For the Horn, this suggests bolstering existing regional bodies like the Intergovernmental Authority on Development (IGAD) with technical mandates and conflict-resolution mechanisms specifically for shared basins, moving beyond their often reactive, politically charged crisis management roles .

Such an approach could create neutral platforms for data-sharing and joint infrastructure planning, potentially insulating water issues from the volatile realm of 'high politics' and military diplomacy . Nevertheless, significant counter-arguments must be engaged([Gabr, 2023](#)). First, the pursuit of integrated basin management risks entrenching 'hydro-hegemony', where more powerful upstream or financially capable states dictate terms under a veneer of technical cooperation.

Ethiopia's regional ambitions and the construction of the Grand Ethiopian Renaissance Dam exemplify this tension, where unilateral development projects become sources of regional friction . A Moroccan-inspired framework would need robust, equitable governance clauses to prevent such an outcome. Second, the foundational challenge of weak state capacity remains paramount.

Even the most elegantly designed IWRM institution will falter if member states lack the domestic administrative and regulatory apparatus to implement agreements or manage their water sectors effectively. This is compounded by the presence of extra-regional actors, whose strategic interests, such as Russia's search for a Red Sea foothold, can distort local incentives and undermine collective action . Ultimately, the discussion posits that the value of the Moroccan model lies not in its specific institutions, but in its demonstration that sustained investment in technical governance capacity and

diplomatic channels can convert a potent conflict driver into a manageable, if persistent, governance challenge([Generoso, 2022](#)).

For the Horn, this implies a dual-track strategy: building adaptive, basin-specific institutions for water sharing while simultaneously addressing the underlying political fragilities that render water a security threat. The transition from scarcity to security is thus fundamentally a political project, requiring governance frameworks robust enough to withstand the region's complex conflict dynamics.

Conclusion

This study has substantiated the central thesis that institutional frameworks are the critical variable determining whether hydrological scarcity escalates into open conflict or is managed as a collective governance challenge([Högbladh, 2022](#)). The evidence presented demonstrates that in the Horn of Africa, quantitative institutional deficits correlate with projected increases in transboundary water conflict risk, while qualitative analysis reveals how these voids are exploited within broader geopolitical rivalries. Conversely, the examination of Morocco's approach illustrates that integrated, diplomatically engaged water governance can mitigate such risks, even under significant climatic stress.

The answer to the research problem, therefore, is that while water scarcity is an immutable reality in the region, its securitisation is not; the pathway to deseculation lies in the deliberate construction of adaptive, legitimate, and technically proficient institutional mechanisms. The specific, adaptable lessons from Morocco's model are twofold([Imbiakha et al., 2021](#)). First, the integration of IWRM principles into national policy and cross-border dialogue provides a technical lingua franca that can depoliticise resource discussions.

Second, the consistent coupling of water management with sustained diplomacy creates durable channels for negotiation that can survive political upheavals. For the Horn, this translates into concrete policy recommendations. Regional bodies, particularly IGAD and the African Union Commission, must move beyond ad hoc mediation—often fraught with the complexities seen in South Sudan—and be empowered with permanent, technically specialised water governance units.

These units should facilitate basin-wide commissions for major river systems, prioritising transparent data exchange and joint climate adaptation strategies. Donor states should align support with this institutional capacity-building, funding not just infrastructure but the governance ecosystems that ensure its equitable and sustainable operation. Future research should pursue comparative analyses of hydro-political regimes across Africa to identify which institutional designs prove most resilient under conditions of state fragility and political volatility([Katete, 2023](#)).

Further study is also needed on the interplay between water diplomacy and the involvement of extra-regional actors, whose interests, as noted with Russia in the Horn, can complicate local governance efforts. In closing, this analysis offers a final reflection: in a region where conflict has often been rooted in competition over resources, effective water governance is far more than a technical environmental concern. It is a cornerstone of political stability and a prerequisite for sustainable development.

By converting shared vulnerability into a platform for cooperation, robust institutional frameworks for water security can serve as a foundational pillar for a more peaceful Horn of Africa.

Contributions

This study makes a significant contribution by developing an integrated analytical framework that synthesises institutional analysis with conflict theory, specifically applied to transboundary water governance in arid regions. It provides novel empirical data on the operational challenges and cooperative mechanisms within Morocco's water institutions from 2021 to 2023.

Practically, the findings offer evidence-based policy recommendations for enhancing institutional resilience and pre-emptive conflict mitigation. The research thereby advances scholarly discourse in political science by demonstrating how mixed methods can elucidate the complex interplay between resource governance, institutional design, and regional security dynamics.

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