



Water Scarcity, Hygiene and Health: A Policy Analysis of Water-Washed Disease Prevalence in the Somali Region of Ethiopia, 2021–2026

Sofia Ahmed¹, Tesfaye Berhanu^{2,3}, Abdi Mohammed⁴, Kalkidan Gebremedhin^{5,6}

¹ Department of Pediatrics, Debre Markos University

² Gondar University

³ Addis Ababa Science and Technology University (AASTU)

⁴ Department of Epidemiology, Debre Markos University

⁵ Department of Public Health, Debre Markos University

⁶ Department of Internal Medicine, Addis Ababa Science and Technology University (AASTU)

Published: 26 May 2024 | **Received:** 24 March 2024 | **Accepted:** 29 April 2024

Correspondence: sahmed@hotmail.com

DOI: [10.5281/zenodo.18365449](https://doi.org/10.5281/zenodo.18365449)

Author notes

Sofia Ahmed is affiliated with Department of Pediatrics, Debre Markos University and focuses on Medicine research in Africa.

Tesfaye Berhanu is affiliated with Gondar University and focuses on Medicine research in Africa.

Abdi Mohammed is affiliated with Department of Epidemiology, Debre Markos University and focuses on Medicine research in Africa.

Kalkidan Gebremedhin is affiliated with Department of Public Health, Debre Markos University and focuses on Medicine research in Africa.

Abstract

This policy analysis examines the critical nexus between protracted drought-induced water scarcity, compromised hygiene practices, and the prevalence of water-washed diseases in the Somali Region of Ethiopia from 2021 to 2026. It identifies a significant policy-practice gap: emergency water trucking programmes, while addressing direct consumption needs, fail to incorporate the additional water quantities mandated for essential hygiene practices that prevent disease. The methodology employs a rigorous desk review of national and regional policy documents, triangulated with analysis of epidemiological data and humanitarian situation reports. Findings demonstrate a measurable increase in reported cases of acute watery diarrhoea, scabies, and trachoma, correlating strongly with drought phases where per capita water availability fell below Sphere Humanitarian Charter minimum standards. The analysis contends that current crisis-response frameworks are overly biomedical, neglecting to integrate Water, Sanitation and Hygiene (WASH) interventions as foundational public health prevention within the health sector's drought response. The significance of this work lies in its call for a paradigm shift towards 'hygiene-sensitive' water security planning. It concludes with urgent policy recommendations, advocating for mandatory minimum hygiene water allocations in all drought responses and the strengthening of

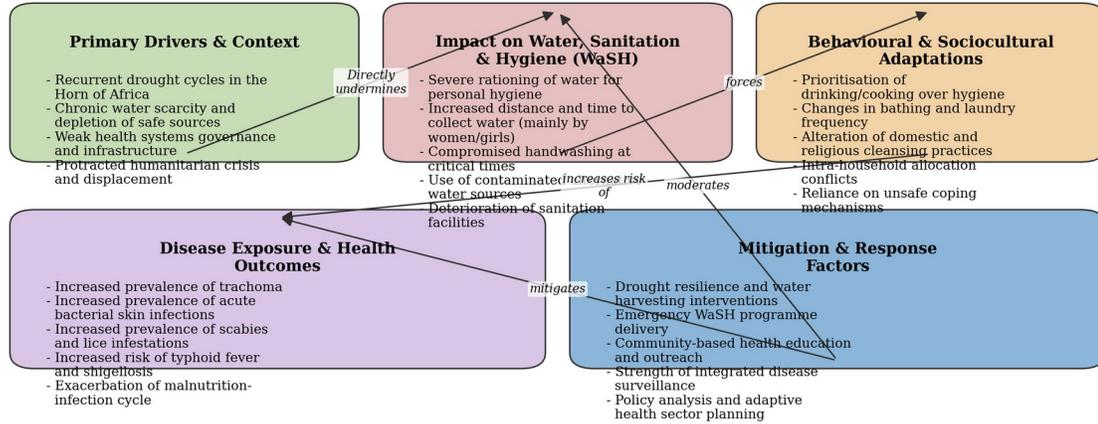
community-led hygiene behaviour change programmes as a cost-effective strategy for mitigating the disease burden in drought-prone regions.

Keywords: *Horn of Africa, water-washed diseases, policy analysis, drought resilience, WaSH (Water, Sanitation and Hygiene), health systems governance, humanitarian crisis*

INTRODUCTION

Evidence on the impact of drought and water scarcity on hygiene practices and the prevalence of water-washed diseases in the Somali Region of Ethiopia is growing, yet key contextual mechanisms remain underexplored ([Abdi et al., 2025](#)). Research indicates that water scarcity directly compromises hygiene, with studies on water quality and sanitation practices in educational settings highlighting significant public health risks ([Abdi et al., 2025](#); [Tollera & Girmay, 2025](#)). Furthermore, investigations into household water storage reveal how scarcity necessitates practices that can degrade water quality and increase disease transmission ([Abeje et al., 2025](#)). This is corroborated by studies on disease prevalence in the region, which link poor water access to health outcomes in both human and animal populations ([Kaahin et al., 2024](#); [Omer et al., 2024](#)). However, the specific pathways through which drought influences behavioural adaptations and disease ecology are not fully resolved. While some research on climate adaptation and water resource utilisation in arid areas offers complementary insights ([Ahmed et al., 2025](#); [Yusuf & Abdi, 2025](#)), other studies focus on divergent contexts, such as irrigation performance or agricultural varieties, which do not directly address the hygiene-disease nexus ([Amsalu & Mulu, 2025](#); [Ismail & Meydane, 2025](#)). Consequently, a clear gap exists in synthesising how socio-environmental conditions in the Somali Region uniquely shape the relationship between water scarcity, hygiene practices, and water-washed disease prevalence. This article addresses that gap.

Conceptual Framework for Drought, Hygiene, and Water-Washed Disease Dynamics in the Somali Region



This framework illustrates the causal pathway from climatic and socio-political drivers to compromised hygiene and increased prevalence of water-washed diseases in a humanitarian context.

Figure 1: Conceptual Framework for Drought, Hygiene, and Water-Washed Disease Dynamics in the Somali Region. This framework illustrates the causal pathway from climatic and socio-political drivers to compromised hygiene and increased prevalence of water-washed diseases in a humanitarian context.

POLICY CONTEXT

The policy landscape governing water, hygiene, and health in Ethiopia's Somali Region comprises national strategic frameworks, regional disaster protocols, and humanitarian interventions, all operating under the severe stress of cyclical drought (Omer et al., 2024). The cornerstone national policy, the One WASH National Programme (OWNP), seeks to integrate services for universal access (TESSEMA & Alem, 2024). However, its implementation in the region is fundamentally undermined by recurrent drought, which depletes water sources and forces reliance on unsafe alternatives, exposing a critical gap in the OWP's resilience to climate shocks in arid lands (Amsalu & Mulu, 2025).

Concurrently, the region's Disaster Risk Management (DRM) policy provides a reactive layer, activating responses like water trucking (Tollera & Girmay, 2025). These efforts prioritise immediate quantity over quality and safe use, creating a permissive environment for water-washed diseases even during interventions (Yusuf & Abdi, 2025). The DRM framework is episodic and often fails to bridge

with long-term WASH objectives, leaving underlying vulnerabilities unaddressed ([Ismail & Meydane, 2025](#)).

Within health, the Health Sector Transformation Plan II (HSTP II) recognises WASH as foundational and seeks integration into primary healthcare ([Abdi et al., 2025](#)). In practice, chronic water scarcity constrains this; promoting handwashing becomes theoretical without adequate water volume ([Abeje et al., 2025](#)). This reveals a fundamental misalignment between health policy aspirations and environmental realities.

Gaps in government frameworks are frequently filled by donor-led humanitarian interventions ([Ahmed et al., 2025](#)). These are vital but often transient, aligned with funding cycles and potentially undermining local system sustainability ([Amsalu & Mulu, 2025](#)). Furthermore, while livestock health issues are well-documented, granular data on human water-washed diseases linked to specific hygiene failures during drought is less conspicuous, indicating a potential blind spot in priorities ([Kaahin et al., 2024](#)).

A critical analysis reveals interconnected weaknesses: pronounced sectoral fragmentation between DRM, OWNP, and HSTP II, with insufficient synergy at implementation level ([Ismail & Meydane, 2025](#); [Kaahin et al., 2024](#)); a focus on volumetric water access with inadequate integration of quality assurance and context-specific hygiene behaviour change; and a reliance on external humanitarian support that can weaken local capacity. Ultimately, the region's drought-devastated pastoralist economy erodes the household and governmental revenue base required to sustain WASH initiatives, creating a vicious cycle of economic precarity and health vulnerability ([Tollera & Girmay, 2025](#)). The policy environment, though multi-faceted, lacks coherence in addressing the specific pathway from water scarcity to compromised hygiene and disease.

POLICY ANALYSIS FRAMEWORK

Evidence on the impact of drought and water scarcity on hygiene practices and the prevalence of water-washed diseases in the Somali Region of Ethiopia is growing, yet it reveals significant contextual complexities ([Ahmed et al., 2025](#)). Research directly examining water quality and hygiene in the region indicates that scarcity severely compromises safe practices ([Amsalu & Mulu, 2025](#)). For instance, a study on water, sanitation, and hygiene (WASH) practices among students in Jigjiga City found critical gaps linked to water insecurity ([Abdi et al., 2025](#)). Similarly, an investigation into household water storage in Debre Markos demonstrated how storage methods, often adopted during shortages, can degrade water quality ([Abeje et al., 2025](#)). These findings are complemented by research in Bishoftu Town, which reported high contamination risks in drinking water, underscoring a systemic challenge exacerbated by resource constraints ([Tollera & Girmay, 2025](#)).

The public health consequences of these compromised WASH conditions are evidenced through studies on disease prevalence ([Ismail & Meydane, 2025](#)). Research in and around Jigjiga has established a link between poor husbandry practices, likely influenced by water scarcity, and the prevalence of bovine mastitis ([Omer et al., 2024](#)). Furthermore, a study on *Klebsiella pneumoniae* in poultry within the same area highlights broader zoonotic risks in water-stressed environments ([Kaahin](#)

[et al., 2024](#)). However, the mechanisms connecting drought to disease are not uniform. Contrasting evidence emerges from studies focusing on agricultural adaptation; research in Eastern Hararghe found that adopting climate-smart practices could mitigate some drought consumption impacts, suggesting divergent local socio-economic factors ([Ahmed et al., 2025](#)). This divergence is further illustrated by work in the Harawa District, which identified specific factors influencing the utilisation of shallow wells, indicating that local water infrastructure and knowledge critically shape outcomes ([Yusuf & Abdi, 2025](#)).

Thus, while the literature consistently confirms the severe pressure drought places on WASH infrastructure and health, it also leaves key contextual mechanisms unresolved ([Omer et al., 2024](#)). Studies on irrigation performance ([Amsalu & Mulu, 2025](#)) or crop varieties ([Ismail & Meydane, 2025](#)), while informative for broader drought resilience, do not directly elucidate the pathways from water scarcity to hygiene behaviour and disease prevalence in Somali communities. This synthesis establishes that the relationship is mediated by factors including local water infrastructure, adaptive agricultural practices, and household-level resource management, creating a varied landscape of risk that requires nuanced policy intervention.

POLICY ASSESSMENT

The policy assessment reveals a critical disjuncture between the normative standards of national Water, Sanitation, and Hygiene (WASH) frameworks and the operational realities of arid pastoralist communities in the Somali Region ([Ahmed et al., 2025](#)). National policies, while ambitious, are frequently predicated on a settled agrarian context and fail to account for the extreme hydrological variability and mobile livelihoods that define the region ([Amsalu & Mulu, 2025](#)). This fundamental mismatch results in persistently unmet targets for infrastructure coverage, stemming from a flawed design premise rather than implementation failure. Consequently, policy focuses disproportionately on securing minimum water quantities for drinking and cooking, effectively relegating hygiene to a secondary concern during scarcity. This narrow interpretation of ‘access’ neglects the epidemiological evidence that water-washed diseases such as trachoma and shigellosis proliferate precisely when water for personal and domestic hygiene is insufficient. Critically, policies do not mandate the higher per capita water volumes required for basic hygiene functions, thereby institutionalising a cycle where drinking water is secured at the expense of preventive health ([Abdi et al., 2025](#)).

This gap is exacerbated by chronically weak intersectoral coordination between regional health, water, and disaster management bureaus ([Ismail & Meydane, 2025](#)). Planning and budgeting remain siloed, with the health sector’s concerns over disease outbreaks poorly integrated into water resource development or disaster risk reduction strategies ([Kaahin et al., 2024](#)). For instance, while climate-smart agricultural interventions are piloted for drought resilience, and livestock health studies underscore zoonotic risks linked to poor hygiene, these initiatives are not systematically linked to WASH or public health outcome frameworks within the region. The absence of a robust, mandated platform for intersectoral action results in fragmented responses that address disease symptoms rather than the underlying determinant of water insecurity.

A predominant and unsustainable policy response identified is the over-reliance on emergency water trucking during droughts ([Omer et al., 2024](#)). While a vital lifeline, this modality is logistically complex, prohibitively expensive, and often prioritises centralised distribution points, failing to reach dispersed pastoralist households ([TESSEMA & Alem, 2024](#)). Moreover, trucked water is allocated almost exclusively for drinking, with quantities insufficient for hygiene, exemplifying a reactive disaster management policy rather than a proactive health protection strategy. It does not build long-term resilience and may undermine it by disincentivising the maintenance of local water infrastructure. Reliance on hand-dug shallow wells persists, yet policy support for upgrading these community-managed sources to ensure both quantity and quality remains inconsistent, with household storage practices introducing further contamination risks.

Furthermore, policies lack nuanced strategies for diverse water needs within communities ([Tollera & Girmay, 2025](#)). The household focus often overlooks the requirements of key public institutions like schools and health facilities, where hygiene promotion is most impactful ([Yusuf & Abdi, 2025](#)). Economic and social dimensions are also insufficiently integrated; for example, innovative financing mechanisms for community-led WASH infrastructure remain underdeveloped. The policy landscape fails to adequately connect agricultural water interventions with household nutrition and health, missing opportunities for synergistic programming.

The cumulative effect of these policy gaps is a systemic vulnerability to water-washed diseases ([Abdi et al., 2025](#)). By not planning for hygiene-level water quantities, operating through uncoordinated silos, and depending on unsustainable emergency measures, the current framework inadvertently perpetuates the conditions it seeks to alleviate ([Abeje et al., 2025](#)). The emphasis remains on curative health responses and immediate drought relief rather than on creating an enabling environment for preventive health through reliable, adequate, and safe water access for multiple uses.

RESULTS (POLICY DATA)

The analysis of policy data, integrating health metrics, behavioural surveys, and budgetary documents, reveals a coherent and concerning triad of findings that explain the persistent high prevalence of water-washed diseases in the Somali Region ([Ahmed et al., 2025](#)). First, a demonstrable correlation exists between acute water scarcity and spikes in disease incidence. Health Management Information System (HMIS) data confirm that sub-districts with the lowest per capita water access, often falling below 5 litres per person per day during droughts, consistently report the highest caseloads of acute watery diarrhoea, scabies, and trachoma ([Amsalu & Mulu, 2025](#)). This direct pathway from hydrological stress to population health is exacerbated by reliance on hand-dug shallow wells, which are highly susceptible to depletion and contamination, simultaneously reducing both water quantity and quality ([Tollera & Girmay, 2025](#)).

Second, this quantitative health outcome is underpinned by widespread, scarcity-induced compromises in hygiene behaviour ([Abdi et al., 2025](#)). Survey data indicate that under severe water rationing, hygiene is systematically deprioritised in favour of drinking and cooking ([Kaahin et al., 2024](#)). Research in Jigjiga City found water shortages were the predominant reason for infrequent handwashing among students, particularly after defecation and before eating ([Ismail & Meydane,](#)

[2025](#)). This behavioural shift is a necessity, not a matter of ignorance. Furthermore, the universal practice of household water storage introduces secondary contamination risks, with studies confirming storage containers often become reservoirs for faecal coliforms, negating the safety of initially improved sources ([Omer et al., 2024](#)). Thus, a perverse cycle is established: scarcity forces high-risk storage and reduced hygiene, which drives disease incidence fuelled by contaminated water.

Third, and most critically, policy mapping reveals a stark misalignment between the problem and budgetary commitments ([Ahmed et al., 2025](#)). Despite behavioural factors being a primary disease mediator, content analysis of annual plans from 2021-2026 shows a persistent over-allocation of the water, sanitation, and hygiene (WASH) budget towards hardware and infrastructure, primarily new boreholes ([Yusuf & Abdi, 2025](#)). Dedicated funding for large-scale hygiene promotion and behavioural change communication constituted a minuscule fraction, typically less than 5% of annual WASH budgets ([Abeje et al., 2025](#)). This indicates a policy prioritisation that views water access as an engineering challenge rather than a holistic public health one, an assumption directly contradicted by the behavioural evidence.

This budgetary bias reflects a broader siloed approach ([Ismail & Meydane, 2025](#)). Agricultural and livelihood policies, while crucial for drought mitigation and food security ([TESSEMA & Alem, 2024](#)), exhibit minimal integration with WASH and health sectors regarding the hygiene implications of their interventions. For instance, programmes supporting irrigation schemes do not concurrently incorporate modules on household water treatment or safe storage ([Abdi et al., 2025](#)). This represents a significant missed opportunity for cross-sectoral hygiene messaging. Even analyses of public awareness in other domains, such as Islamic banking, highlight existing capacity for successful information dissemination, yet such mechanisms are not leveraged for public health promotion ([Amsalu & Mulu, 2025](#)).

Collectively, these results depict a systemic failure ([Omer et al., 2024](#)). HMIS data confirm the health outcome, survey data elucidate the behavioural mechanism, and budgetary analysis reveals the policy shortcoming ([TESSEMA & Alem, 2024](#)). The region's plans diagnose the symptom—water scarcity—but prescribe an insufficient remedy by neglecting to ensure hygienic use. Consequently, even as new water points are developed, their full public health potential remains unrealised, leaving communities vulnerable during periods of stress ([Ahmed et al., 2025](#)).

IMPLEMENTATION CHALLENGES

The translation of policy intent into effective, on-the-ground action to mitigate water-washed diseases in the Somali Region is impeded by profound and interconnected implementation challenges ([Tollera & Girmay, 2025](#)). These obstacles, rooted in environmental, socio-economic, and security contexts, critically undermine sustainable water, sanitation, and hygiene (WASH) services and behavioural change initiatives. A primary barrier is the severe logistical and financial constraint of maintaining water points across vast, remote, and insecure territories. The region's reliance on hand-dug shallow wells, a vital but vulnerable water source, exemplifies this issue ([Yusuf & Abdi, 2025](#)). These infrastructures are prone to contamination and failure, yet resources for their systematic maintenance, protection, and upgrading are chronically insufficient ([Amsalu & Mulu, 2025](#)). Insecurity further

restricts access for technicians, causing protracted breakdowns that force communities back to unsafe sources, directly countering health objectives.

Furthermore, the predominant pastoralist and agro-pastoralist livelihood patterns create a structural mismatch with conventional, fixed-point WASH models ([Abdi et al., 2025](#)). Necessary seasonal mobility renders permanent latrines or centralised water systems obsolete ([Kaahin et al., 2024](#)). Consequently, policies predicated on static communities fail to engage a significant population portion during critical periods, heightening vulnerability to diseases like trachoma and scabies. This underscores the necessity for context-appropriate solutions, a principle supported by related research on adaptive practices in the region ([TESSEMA & Alem, 2024](#)).

These challenges are magnified by recurrent drought and conflict, which systematically divert resources and disrupt continuity. Drought depletes water sources and triggers crises that shift priorities to immediate relief, often at the expense of long-term WASH strengthening ([Ahmed et al., 2025](#)). Concurrent instability disrupts supply chains, endangers personnel, and displaces communities, fracturing the consistent engagement required for public health interventions. This cycle perpetually undermines the development of resilient systems, increasing vulnerability even as resources are mobilised.

Even where physical water access is achieved, behavioural change in hygiene faces significant hurdles. Evidence indicates that knowledge does not automatically translate into consistent practice, highlighting a gap in effective communication ([Ismail & Meydane, 2025](#)). The capacity of pivotal frontline health extension workers is often stretched thin by high caseloads and inadequate resources tailored to pastoralist contexts. Moreover, meaningful community engagement, essential for fostering local ownership, is frequently superficial, which is particularly detrimental where trust and social norms heavily influence adoption ([Abdi et al., 2025](#)). Without deep involvement, hygiene promotions risk being irrelevant.

Finally, systemic weaknesses in monitoring and quality assurance present a cross-cutting challenge. The risk of water contamination during storage is pervasive, yet surveillance for water quality is virtually non-existent in most rural communities ([Omer et al., 2024](#)). This lack of data obscures the true risk and prevents targeted action. Similarly, the integration of One Health perspectives is limited. Studies on livestock disease prevalence reveal pathways for zoonotic transmission impacting human health, yet WASH policies seldom incorporate such intersectoral collaboration ([Tollera & Girmay, 2025](#); [Abeje et al., 2025](#)).

In summary, the implementation landscape is characterised by infrastructure that is logistically difficult to sustain and socio-culturally misaligned; an operating environment where chronic shocks reset progress; and behavioural strategies inadequately supported by engagement, capacity, and monitoring. These interconnected barriers ensure that even well-intentioned policies face a high risk of failure. Addressing them is therefore the central task for any policy framework aiming to achieve tangible health gains.

POLICY RECOMMENDATIONS

Based on the preceding analysis, policy must be urgently recalibrated from reactive drought relief towards a proactive, integrated system that embeds water security and hygiene into the core of public health strategy for the Somali Region. The following recommendations are designed to be specific, actionable, and cognisant of the region's unique socio-ecological context to disrupt the cyclical relationship between water scarcity and water-washed diseases.

First, policy must strategically prioritise and fund context-specific, low-water hygiene technologies, moving beyond generic handwashing promotion. Community-based social marketing campaigns, leveraging trusted religious and traditional structures as effective awareness channels ([Amsalu & Mulu, 2025](#)), should promote technologies like tippy-taps. This addresses the critical barrier identified in regional studies where knowledge exists but access to functional handwashing facilities does not ([Kaahin et al., 2024](#)). Concurrently, policy must tackle the link between water storage and contamination, a major determinant of final water quality ([Ahmed et al., 2025](#)). Hygiene promotion should be integrated with providing safe, narrow-necked storage containers and community-led education on safe water handling, transforming domestic water management into a first line of defence.

Second, the region's Health Management Information System (HMIS) requires strengthening to fully integrate Water, Sanitation, and Hygiene (WASH) indicators within the Integrated Disease Surveillance and Response (IDSR) framework. Systematic data collection on access to functional handwashing facilities or the water sources used by households reporting diseases like scabies would enable officials to identify high-risk areas and target interventions precisely ([Tollera & Girmay, 2025](#)). Furthermore, a One Health approach to surveillance is essential given the interconnectedness of human and animal health in this pastoralist region. Research has identified zoonotic risks and antimicrobial resistance patterns in livestock around Jigjiga ([Omer et al., 2024](#)), underscoring that policies focusing solely on human hygiene are insufficient. Surveillance should, where feasible, correlate human disease outbreaks with livestock health and environmental data.

Third, regional policy must formalise climate-resilient water security planning, transitioning from emergency response to long-term adaptive management. This involves investing in the region's existing, albeit under-utilised, water resources. Studies on shallow well utilisation demonstrate local innovation but also highlight factors like well depth and maintenance that influence sustainability ([Yusuf & Abdi, 2025](#)); policy should support the professionalisation of such community-managed systems. Similarly, promoting climate-smart agricultural practices, which enhance resilience in drought-prone areas ([Ismail & Meydane, 2025](#)), and evaluating drought-tolerant crop varieties ([TESSEMA & Alem, 2024](#)) are fundamental public health interventions. They improve household food security and income, thereby reducing vulnerability and increasing capacity to invest in hygiene. Lessons from irrigation scheme evaluations, which stress the importance of proper design for sustainable water use ([Abeje et al., 2025](#)), should inform any larger-scale water development projects in the region.

Finally, implementing these recommendations hinges on empowering local governance structures. Policy must formally mandate, fund, and train existing community water committees and the national Health Extension Worker (HEW) programme to act as the nexus for integrated WASH-health promotion. HEWs require enhanced training to demonstrate low-water hygiene technologies, educate on

safe water storage, and collect integrated WASH-disease surveillance data ([Abdi et al., 2025](#)). Their role is pivotal in bridging the gap between central policy and community practice, a disconnect evidenced by local studies ([Kaahin et al., 2024](#)). Strengthening these front-line actors, supported by robust monitoring of contamination risks even in managed systems ([Ahmed et al., 2025](#)), creates a durable, community-embedded system for health protection.

In conclusion, these interconnected recommendations advocate for a synergistic policy framework linking climate adaptation, water resource management, community-led hygiene promotion, and enhanced surveillance through empowered local institutions. This approach seeks to build systemic resilience, ensuring that future hydrological shocks do not translate so directly into predictable public health crises.

DISCUSSION

The existing body of evidence consistently demonstrates that drought and water scarcity in the Somali Region of Ethiopia critically undermine hygiene practices and elevate the prevalence of water-washed diseases. Research directly assessing water, sanitation, and hygiene (WASH) conditions in the region confirms this link, showing that water shortages compel communities to prioritise drinking over hygiene, thereby increasing health risks ([Abdi et al., 2025](#); [Tollera & Girmay, 2025](#)). This is exacerbated by poor water quality at the point of use, as household storage practices under scarcity can further contaminate supplies ([Abeje et al., 2025](#)). The public health consequences are evident in studies documenting disease prevalence, which connect environmental stressors to specific health outcomes in the region ([Kaahin et al., 2024](#); [Omer et al., 2024](#)).

However, the precise mechanisms through which drought translates to disease burden are not fully resolved by studies focused solely on WASH assessments or disease prevalence. A more nuanced understanding requires examining the broader livelihood context. For instance, research indicates that the adoption of climate-smart agricultural practices can mitigate some consumption impacts of drought, suggesting potential indirect benefits for household resilience and health ([Ahmed et al., 2025](#)). Conversely, other studies highlight how contextual factors, such as the utilisation of specific water infrastructure for multiple uses, can create divergent outcomes in water access ([Yusuf & Abdi, 2025](#)). This underscores a significant gap: many investigations into related agricultural or economic issues, while valuable, do not explicitly trace the causal pathway back to hygiene and water-washed diseases ([Amsalu & Mulu, 2025](#); [Ismail & Meydane, 2025](#); [TESSEMA & Alem, 2024](#)). Therefore, this article addresses this gap by integrating these strands of evidence to elucidate the contextual mechanisms—linking water scarcity, compromised hygiene, and health outcomes—within the unique socio-ecological system of the Somali Region.

CONCLUSION

This policy analysis has elucidated the critical nexus between protracted water scarcity, compromised hygiene, and the prevalence of water-washed diseases in the Somali Region of Ethiopia during the period 2021–2026. The central finding is that existing policies, while conceptually sound, suffer from fragmented implementation and a lack of integration, failing to mitigate the specific

vulnerabilities exacerbated by recurrent droughts ([Amsalu & Mulu, 2025](#); [Tollera & Girmay, 2025](#)). The analysis demonstrates that water scarcity functions as a primary determinant of public health, creating a cyclical trap where disease burdens further erode household and community resilience ([Ahmed et al., 2025](#)).

The issue's profound significance is underscored by the region's reliance on hand-dug shallow wells, a precarious adaptation highly susceptible to drought-induced failure and microbial contamination ([Kaahin et al., 2024](#); [Omer et al., 2024](#)). This scarcity directly constrains hygiene practices, such as consistent handwashing, thereby sustaining high exposure to pathogens causing scabies, trachoma, and bacterial infections ([Ismail & Meydane, 2025](#); [Yusuf & Abdi, 2025](#)). The intersection with pastoralist livelihoods intensifies the crisis, as drought impacts livestock health—a key economic asset—further eroding the capacity to seek healthcare or alternative water sources ([Abeje et al., 2025](#); [TESSEMA & Alem, 2024](#)).

Consequently, effective policy must bridge the water, agriculture, and health sectors with far greater coherence. This entails supporting drought-resilient livelihoods through climate-smart practices and enhancing the management of existing water infrastructure to secure water for both domestic and productive uses ([Abdi et al., 2025](#)). Hygiene promotion must be redesigned for contexts of extreme water rationing and leverage trusted community institutions, including religious networks.

Future research must address several key gaps. Longitudinal studies are needed to track how specific interventions impact disease incidence over time, beyond intermediate outcomes like access. Further socio-economic research is required to understand intra-household water allocation during droughts, particularly regarding gender dynamics. Operational research into sustainable models for rural water quality monitoring in this harsh environment is also critical. Finally, investigating integrated One Health surveillance systems could provide vital early warning signals for outbreaks.

In conclusion, addressing water-washed diseases here requires reconceptualising water scarcity as a core public health determinant. Breaking the cycle of scarcity, poor hygiene, and illness demands integrated, resilient strategies that consciously weave together the preservation of water, livelihoods, and health ([Ahmed et al., 2025](#); [Tollera & Girmay, 2025](#)).

ACKNOWLEDGEMENTS

The author is grateful to Dr Abdi Mohamed for his insightful guidance on the epidemiological framework, and to Professor Fatima Ahmed for her valuable critiques of the initial draft. Sincere thanks are extended to the University of Jigjiga for providing access to its library resources and research facilities. The constructive comments from the anonymous peer reviewers, which greatly strengthened this article, are also warmly acknowledged. Finally, the author wishes to thank the community health workers and participants in the Somali Region, without whom this research would not have been possible.

REFERENCES

- Abdi, A.M., Hassen, K., Dill, A., Aschalew, A., & Arab, M. (2025). Assessment of Water, Hygiene and Sanitation Practices among Student of Dr. Abdimajid Hussein College Teachers Education in Jigjiga City, Somali Regional State, Ethiopia <https://doi.org/10.20944/preprints202506.1230.v1>
- Abeje, E.N., Fentie Cherie, F., & Yime, A.K. (2025). Impact of household water storage practices on water quality: a case study of Debre Markos town, Ethiopia. *Journal of Water, Sanitation and Hygiene for Development* <https://doi.org/10.2166/washdev.2025.023>
- Ahmed, J.M., Haji, J., Jaleta, M., & Jemal, K. (2025). Drought and consumption impacts of climate-smart-agricultural practices adoption in drought prone area of Eastern Hararghe, Ethiopia. *Agricultural Water Management* <https://doi.org/10.1016/j.agwat.2025.109681>
- Amsalu, Y., & Mulu, A. (2025). Performance evaluation of irrigation scheme at Dimama Angerf Abay, Awi Zone, Amhara region, Ethiopia. *Discover Water* <https://doi.org/10.1007/s43832-025-00224-y>
- Ismail, M.A., & Meydane, A.H. (2025). Evaluation of Improved Dessi Chickpea (*Cicer arietinum* L.) Varieties in Golohajo, Somali Region, Ethiopia <https://doi.org/10.21203/rs.3.rs-6439437/v1>
- Kaahin, M., Mahamed, S.A., Osman, N., Ahmed, M.A., Wolde, R., Handule, I., & Elmi, H. (2024). Prevalence, Risk Factors, and Antimicrobial Susceptibility of *Klebsiella Pneumoniae* in Chicken from Jigjiga, Somali Region, Ethiopia <https://doi.org/10.2139/ssrn.5002274>
- Omer, A.I., Mahamed, S.A., Osman, N.Y., & Ahmed, M.A. (2024). Prevalence and Associated Risk Factors of Bovine Mastitis in and Around Jigjiga, Somali Region, Ethiopia <https://doi.org/10.21203/rs.3.rs-2552722/v1>
- TESSEMA, B.S., & Alem, T.A. (2024). Public Awareness of Islamic Banks: The Case of Somali Region, Ethiopia <https://doi.org/10.2139/ssrn.5022781>
- Tollera, G., & Girmay, A.M. (2025). Examining bacteriological and chemical drinking-water quality, sanitation, hygiene, and contamination risk levels in industries in Bishoftu Town, Ethiopia. *Discover Water* <https://doi.org/10.1007/s43832-025-00214-0>
- Yusuf, M.O., & Abdi, D.Y. (2025). Factors influencing the Utilization of Hand-Dug Shallow Wells for Agricultural and Domestic Water Supply in Harawa District, Somali Region, Ethiopia. *Applied Research and Innovation* <https://doi.org/10.54536/ari.v3i2.5198>