Kabaka's Lake as Microcosm: Climate Change, Urban Pressure and Spring-Fed Water Fragility in Central Uganda

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Abstract

Urban water bodies across Sub-Saharan Africa sit at the intersection of climate-driven hydrological stress and rapid demographic change. This systematic integrative review examines Kabaka's Lake Uganda's largest man-made lake, constructed in the 1880s under Kabaka Mwanga II and located in Kampala's Lubaga Division beside St Lawrence University as a microcosm of the compound pressures facing spring-fed urban lakes across Central Uganda's Lake Victoria catchment. Drawing on peer-reviewed hydrological, climatological, limnological, and governance literature, the review traces a single evidence chain: regional warming of up to 1.5°C since 1960 and increasingly convective rainfall have destabilised the groundwater recharge on which the lake depends; a 78.5% increase in built-up area and a 92.2% contraction of the receiving wetland over 25 years have stripped away the catchment's natural filtration capacity; and the resulting nutrient loading has left the lake nitrogen-limited and algae-dominated, with Secchi transparency of 0.1–0.5 m signalling incipient eutrophic stress and a modelled transition to eutrophic status within approximately 25 years absent intervention. These findings map directly onto SDG 6 (Clean Water and Sanitation), SDG 11 (Sustainable Cities and Communities), SDG 13 (Climate Action), and SDG 15 (Life on Land), and the review identifies fragmented, weakly enforced governance — rather than an absence of formal policy as the principal barrier to implementation. Distinctively, the review leverages the lake's adjacency to a Faculty of Education to propose an integrated catchment stewardship model that couples decentralised wastewater treatment, wetland restoration, and permanent water-quality monitoring with a multi-semester, place-based teacher-education curriculum built around the same evidence base. The review concludes that the sustainable management of spring-fed urban water bodies in Central Uganda requires simultaneous, coordinated action across hydrological monitoring, wetland restoration, governance reform, and pedagogical innovation with Kabaka's Lake positioned as a living laboratory through which pre-service teachers can engage directly with climate-responsive sustainability.

Keywords: Kabaka's Lake, spring-fed urban lake, climate change, urbanisation, eutrophication, place-based education, Sustainable Development Goals, Central Uganda

1. Introduction

Urban water bodies across Sub-Saharan Africa are increasingly situated at the confluence of

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rapid demographic transformation and accelerating climate change (Dos Santos et al., 2017; Idowu & Ajibade, 2024). As cities expand, the inland lakes, wetlands, and artificial reservoirs that once buffered settlements against hydrological variability are now subjected to encroachment, pollution, and altered thermal and hydrological regimes (Mumuni et al., 2025; Lema, 2025; Chepchumba & Ronoh, 2023). These water bodies function as microcosms of wider environmental change: their sediment records shift with land use, their chemistry reflects cumulative anthropogenic stress, and their ecological trajectories foreshadow the sustainability challenges facing entire catchments (Chepchumba et al., 2024). In Central Uganda, where the Lake Victoria basin supports one of the continent's fastest-growing urban agglomerations (Nsubuga et al., 2024), the fate of small urban lakes offers critical insight into the resilience or fragility of spring-fed systems under compound pressures.

Kabaka's Lake occupies a singular position among these water bodies. Constructed in the 1880s under Kabaka Mwanga II of Buganda, the lake lies in Ndeeba within Kampala's Lubaga Division, in immediate proximity to St Lawrence University (Nakagiri et al., 2023). Spanning approximately two square kilometres and reaching depths of up to 200 feet, it is the largest man-made lake in Uganda (Abizarri, 2015; Nakagiri et al., 2023). Unlike surface-flow systems, it is fed principally by underground springs, a hydrological feature that has historically insulated it from seasonal rainfall variability but which also ties its water budget to groundwater dynamics that can be disrupted by impervious surface expansion, aquifer drawdown, and changing precipitation patterns.

This local vulnerability sits inside a regional climate context: Central Uganda has experienced statistically significant warming alongside increasingly erratic rainfall, intensifying convective storms, and prolonged dry spells (Verdin et al., 2012; Oriangi et al., 2024). Layered onto this is the pace of Kampala's urbanisation, where wetlands have been progressively drained and built upon (Warsame et al., 2022; Gideon & Bernard, 2018); Kabaka's Lake catchment receives runoff from garages, washing bays, hostels, and domestic dwellings, introducing oil residues, sewage, and nutrient loads that the remnant wetland buffer is increasingly unable to attenuate. Recent empirical work suggests nutrient loading now threatens the lake's oligotrophic status (Mutyaba et al., 2023), while degradation across the broader Lake Victoria catchment signals basin-wide ecological risk (Deirmendjian et al., 2021; Olokotum et al., 2020; Ssebugere et al., 2022).

These pressures cannot be separated from the normative frameworks meant to govern sustainable development. SDG 6 (Clean Water and Sanitation), SDG 11 (Sustainable Cities and Communities), SDG 13 (Climate Action), and SDG 15 (Life on Land) provide an organising architecture for intervention, yet implementation gaps persist between global commitments and local realities (Nkiaka et al., 2021; Nhamo et al., 2019; Niwagaba et al., 2018; Agbo, 2025). The lake's physical proximity to a Faculty of Education further creates an opportunity to translate hydrological and ecological research into place-based curricula (Yemini, 2025), though this pedagogical dimension of urban water stewardship remains underdeveloped in the Ugandan literature.

Despite a growing body of research on Kampala's wetlands, Lake Victoria eutrophication, and Uganda's climate trends, no comprehensive review has integrated these literatures through the lens of a single urban water body; hydrology, land-use change, water quality, and education policy tend to be treated as separate domains, concealing the synergistic threats that arise when climate variability, urban encroachment, and nutrient loading coincide. This review addresses that gap by examining Kabaka's Lake as a microcosm of the pressures facing urban water bodies across Central Uganda, mapping the synthesised evidence onto the SDG framework, and exploring management and pedagogical responses appropriate to a Faculty of Education situated in close proximity to the lake.

2. Methodology

The study adopted a systematic integrative literature review design (Whittemore & Knafl, 2005), chosen because it permits the simultaneous inclusion of hydrological monitoring, land-use remote sensing, water-quality limnology, climate trend analysis, and education policy research within a single interdisciplinary synthesis. A protocol specifying the search strategy, eligibility criteria, data extraction procedure, and analytical framework was defined prior to literature retrieval.

Searches were run across Web of Science, Scopus, ScienceDirect, PubMed, and Google Scholar, with secondary searches in African Journals Online (AJOL) and the Directory of Open Access Journals (DOAJ) to capture Africa-based studies. The Boolean search string spanned four conceptual clusters: the focal water body and locality (e.g., "Kabaka's Lake," "spring-fed lakes Uganda"); climate and hydrological stressors (e.g., "climate change Central Uganda," "groundwater recharge urbanisation"); anthropogenic pressures (e.g., "wetland encroachment Kampala," "eutrophication urban lakes"); and sustainable development and education responses (e.g., "SDG 6 Uganda," "place-based education higher education"). Records were limited to English-language publications, with no lower temporal bound but a preference for 2000–2026 literature; grey literature (government reports, NDC submissions, UN agency documents) was included selectively for policy context.

Eligibility was applied in two stages. Title/abstract screening retained records addressing the hydrology or ecology of Kabaka's Lake or analogous Ugandan spring-fed lakes; climate trends in Central Uganda or the Lake Victoria basin; land-use change and wetland loss in Kampala; eutrophication or cyanobacterial dynamics in Lake Victoria; or environmental education and place-based pedagogy in Sub-Saharan Africa. Full-text review then filtered for methodological rigour, requiring original data, validated modelling, or systematic analytical frameworks; opinion pieces and non-peer-reviewed conference abstracts were excluded unless they offered unique policy insight.

Data were extracted into a standardised Excel template capturing bibliographic information, study design, geographical and hydrological context, climate parameters, anthropogenic stressors, ecological outcomes, SDG linkages, and management or educational recommendations. Analysis proceeded through descriptive mapping of the literature, inductive thematic coding organised into five themes (hydrological vulnerability; land-use transformation; nutrient dynamics; SDG and policy gaps; pedagogical opportunity), and a final synthesis phase treating Kabaka's Lake as a microcosm — scaling individual findings up to catchment-level implications and scaling global SDG targets down to feasible responses for a proximate Faculty of Education. SDG mapping recorded explicit author-stated linkages verbatim and flagged inferred linkages separately. Quality appraisal drew on adapted Mixed Methods Appraisal Tool (MMAT) and Critical Appraisal Skills Programme (CASP) criteria; studies scoring below moderate quality were retained but flagged and excluded from causal claims.

Four limitations were acknowledged throughout: reliance on English-language sources may under-represent Luganda-language or community knowledge; the scarcity of long-term monitoring data for Kabaka's Lake itself required cautious extrapolation from analogous water bodies; the integrative design precluded meta-analytic effect-size quantification; and grey-literature inclusion introduced variable peer-review standards, mitigated through triangulation against academic sources.

3. Results and Discussion

The evidence below is presented as a single causal chain rather than five loosely connected themes. Regional climate change alters the volume and timing of groundwater recharge (3.1); reduced recharge coincides with rapid urban encroachment that strips away the wetland buffer historically responsible for filtering and moderating inflows (3.2); the combined loss of hydrological stability and filtration capacity drives the lake toward a measurable eutrophication trajectory (3.3); these physical outcomes correspond to specific, named gaps in Uganda's implementation of the Sustainable Development Goals (3.4); and the lake's location beside a Faculty of Education converts each of these deficits into a concrete curricular opportunity (3.5). Section 3.6 consolidates all five stages into a single reference table.

3.1 Climate Trends and Hydrological Vulnerability

Central Uganda's climate record shows consistent, statistically documented warming alongside rainfall that is becoming more erratic in timing and intensity even where annual totals remain stable. Verdin et al. (2012) recorded a temperature increase of up to 1.5°C between 1960 and 2009, equivalent to a warming rate of roughly 0.2°C per decade. Oriangi et al. (2024) corroborated this for the 1980–2010 period, reporting statistically significant increases in both maximum and minimum annual temperatures alongside a non-significant decline in rainfall.

For a spring-fed system such as Kabaka's Lake, the mechanism of harm is indirect but severe. Because the lake depends on groundwater recharge rather than direct surface runoff, its vulnerability lies not in total rainfall but in rainfall pattern: more convective, high-intensity storms shorten infiltration time and increase surface runoff at the expense of aquifer recharge, even when annual totals hold steady. Mutyaba et al. (2023) confirmed that this spring-fed architecture historically buffered the lake against seasonal variability, but Kulabako et al. (2007) showed that peri-urban land use in Kampala already measurably degrades shallow groundwater quality, with nitrate and faecal contamination tracking settlement density. Read together, these findings describe a hydrological paradox: the same storms that could replenish the lake's water budget also flush pollutants through a shrinking, increasingly contaminated recharge zone.

Table 1. *Climate trends in Central Uganda relevant to spring-fed water body hydrology.*

Parameter	Observed Trend	Period	Source
Mean temperature	Increase of up to 1.5°C	1960–2009	Verdin et al. (2012)
Warming rate	~0.2°C per decade	1960–2009	Verdin et al. (2012)
Mean annual maximum temperature	Statistically significant increase	1980–2010	Oriangi et al. (2024)
Mean annual minimum temperature	Statistically significant increase	1980–2010	Oriangi et al. (2024)
Rainfall (total)	Decreasing, non-significant	1980–2010	Oriangi et al. (2024)
Extreme rainfall	Intensifying convective storms	1979–present	Verdin et al. (2012)

3.2 Urban Encroachment and Wetland Loss

Climate-driven recharge stress is compounded by the physical loss of the wetland buffer that would otherwise absorb it. Mutyaba et al. (2023) documented a 78.5% increase in built-up area and a corresponding 92.2% contraction of the receiving wetland around Kabaka's Lake over 25 years — the largest land-use shift reported anywhere in the reviewed literature. Comparable patterns were found across Kampala: Warsame et al. (2022) linked construction activity in the Nsooba wetland to crippled streamflow and reduced storage capacity, and Gideon and Bernard (2018) reported equivalent degradation of flood regulation and biodiversity functions in the Lubigi Wetland System.

The consequence for Kabaka's Lake is a feedback loop rather than a one-off loss. A smaller wetland buffer means less infiltration and lower spring discharge during dry spells; lower discharge concentrates whatever pollutants do enter the lake; and the resulting warmer, more static water column accelerates algal and cyanobacterial metabolism. Turyahabwe et al. (2017) traced part of this failure to implementation rather than absence of policy: wetland protections exist on paper in Uganda but are poorly known and weakly enforced locally.

Table 2. *Land-use change in Kabaka's Lake catchment and analogous Kampala wetlands.*

Indicator	Change	Period	Source
Built-up area	+78.5% increase	Past 25 years	Mutyaba et al. (2023)
Vegetated cover	−37.2% reduction	Past 25 years	Mutyaba et al. (2023)

Receiving wetland footprint	−92.2% contraction	Past 25 years	Mutyaba et al. (2023)
Wetland storage capacity	Constrained by encroachment	Recent decades	Warsame et al. (2022)
Streamflow	Crippled by construction	Recent decades	Warsame et al. (2022)

3.3 Water Quality and the Eutrophication Trajectory

The combined effect of hydrological stress and wetland loss is visible in the lake's water chemistry. Mutyaba et al. (2023) — the only site-specific limnological study of Kabaka's Lake — classified it as still oligotrophic (Trophic State Index below 40), but every secondary indicator points toward the same eutrophic endpoint: total nitrogen of 10.5–15.3 mg/L and total phosphorus of 1.00–2.37 mg/L are elevated for an oligotrophic system, and Secchi transparency of just 0.1–0.5 m indicates algal biomass already high enough to reduce light penetration. On this basis, the same authors projected a transition to eutrophic status within approximately 25 years without intervention.

This trajectory mirrors the wider Lake Victoria basin, where Deirmendjian et al. (2021) traced decades of progressive eutrophication and deep-water deoxygenation, and Ssebugere et al. (2022) linked nutrient loading and warming to the growing dominance of toxigenic cyanobacteria. The nutrient source is largely sanitary rather than agricultural: Niwagaba et al. (2018) found that most of Kampala's sewage is discharged untreated, and Katukiza et al. (2014) and Kwiringira et al. (2014) documented the poor condition of shared latrines and grey-water disposal in surrounding slums. Because Kabaka's Lake receives this loading through a continuous, low-volume groundwater pathway rather than periodic surface pulses, it cannot rely on storm dilution the way surface-fed lakes can — nutrients accumulate steadily, making the eutrophication trajectory slower to appear but harder to reverse once established.

Table 3. *Water quality parameters at Kabaka's Lake.*

Parameter	**Range/Value**	**Trophic Significance**	**Source**
Total nitrogen	10.5–15.3 mg/L	Oligotrophic but elevated	Mutyaba et al. (2023)
Total phosphorus	1.00–2.37 mg/L	Oligotrophic but elevated	Mutyaba et al. (2023)
Trophic State Index	< 40	Oligotrophic	Mutyaba et al. (2023)
Secchi disk transparency	0.1–0.5 m	Reduced; early eutrophic indicator	Mutyaba et al. (2023)

Dominant limitation	Nitrogen-limited	Favours certain algal taxa	Mutyaba et al. (2023)
Projected trajectory	Eutrophic within ~25 years	Without intervention	Mutyaba et al. (2023)

3.4 SDG Intersections and Governance Gaps

Each physical pressure documented in 3.1–3.3 corresponds to a specific, missed SDG target rather than a generic sustainability shortfall. Nkiaka et al. (2021) found that sub-Saharan Africa's SDG 6 water-security indicators remain well below global benchmarks, and Nhamo et al. (2019) questioned whether the 2030 deadline is realistic given financing and governance constraints; for Kampala specifically, Agbo (2025) attributed the shortfall to institutional fragmentation and weak inter-agency coordination rather than an absence of formal policy.

The clearest governance failure is jurisdictional. Turyahabwe et al. (2017) and Ogwal et al. (2024) both found that wetland protections exist in statute but are undermined locally by low awareness, conflicting land tenure, and weak enforcement capacity. For Kabaka's Lake, this means catchment protection falls between overlapping mandates, with no single authority responsible for land use, pollution control, and water quality as an integrated system — a structural gap the recommendations (Section 5) address directly.

Table 4. *Mapping of Kabaka's Lake pressures onto relevant SDG targets.*

SDG	Relevant Target	Lake-Specific Pressure	Evidence Source
6.3	Improve water quality by reducing pollution	Untreated sewage, grey water, oil residues from garages	Niwagaba et al. (2018); Katukiza et al. (2014)
6.6	Protect and restore water-related ecosystems	Wetland loss (−92.2%), reduced infiltration	Mutyaba et al. (2023); Ogwal et al. (2024)
11.3	Inclusive and sustainable urbanisation	Unregulated built-up expansion (+78.5%)	Mutyaba et al. (2023); Warsame et al. (2022)
11.5	Reduce environmental impact of cities	Flash flooding, reduced wetland storage	Warsame et al. (2022); Gideon & Bernard (2018)
13.1	Strengthen resilience to climate hazards	Temperature increase, erratic rainfall	Verdin et al. (2012); Oriangi et al. (2024)
15.1	Conserve freshwater ecosystems	Eutrophication trajectory, algal dominance	Mutyaba et al. (2023); Olokotum et al. (2020)

3.5 Pedagogical Opportunities Arising from the Evidence

The lake's proximity to a Faculty of Education converts each deficit documented above into a specific curricular entry point rather than a generic call for "environmental education." Yemini's (2025) systematic review found that locally grounded, experiential learning measurably improves environmental literacy and civic participation, and the parameters already being tracked at Kabaka's Lake — total nitrogen, total phosphorus, Secchi depth, Trophic State Index — give pre-service teachers a ready-made, real-data monitoring exercise rather than a simulated one. Catchment mapping exercises can draw directly on the land-use change figures in Table 2, and community-based conservation modules can draw on the governance analysis of Turyahabwe et al. (2017) and Ogwal et al. (2024).

The reviewed literature also warns against a narrowly technical version of this pedagogy. Niwagaba et al. (2018), Katukiza et al. (2014), and Kwiringira et al. (2014) show that the lake's degradation is entangled with poverty and informal settlement dynamics, not just ecology; a curriculum that teaches water chemistry without the socio-political drivers documented by Agbo (2025) risks producing graduates who are environmentally literate but unable to engage with the governance failures identified in 3.4.

3.6 Synthesis: The Evidence Chain at a Glance

Table 5 consolidates 3.1–3.5 into a single reference view, tracing each pressure domain from its physical driver through to its supporting evidence, its SDG target, and its recommended management or pedagogical response.

Table 5. *Integrated synthesis of pressures, evidence, SDG linkage, and recommended response.*

Domain	Key Finding	SDG Link	Recommended Response
Climate / hydrology	Warming of up to 1.5°C (1960–2009); rainfall increasingly convective, reducing recharge efficiency	13.1	Recharge-enhancement measures: permeable surface retrofits, rainwater harvesting
Land use / wetlands	+78.5% built-up area; −92.2% wetland buffer over 25 years	6.6 / 11.3	Gazette remaining wetland as protected zone; phased restoration with indigenous vegetation
Water quality	Oligotrophic but elevated nutrients; Secchi 0.1–0.5 m; eutrophic within ~25 years absent action	6.3 / 15.1	Decentralised wastewater treatment (constructed wetlands, anaerobic baffled reactors); monthly monitoring

Governance	Statutory protections exist but are fragmented and weakly enforced locally	11.5	Statutory catchment management committee spanning municipal, regulatory, university, and community actors
Pedagogy	Place-based education improves engagement but is undocumented in Ugandan higher education	All four SDGs	Formalise the lake as a multi-semester teacher-education site combining monitoring with governance analysis

4. Conclusion

The study set out to review Kabaka's Lake as a microcosm of the pressures facing spring-fed urban water bodies in Central Uganda, and to translate that evidence into an SDG-aligned model of catchment stewardship that couples technical management with place-based teacher education. The synthesised evidence supports this purpose on both counts: it demonstrates that the lake's degradation is driven by a single, traceable chain of climate, land-use, and governance failures, and it confirms that the lake's proximity to a Faculty of Education gives that evidence chain a direct pedagogical application not available to a typical urban water body.

Regional warming of up to 1.5°C and increasingly convective rainfall have reduced the reliability of the groundwater recharge that historically buffered the lake from seasonal variability. This climatic stress has coincided with a 78.5% expansion of built-up area and a 92.2% contraction of the receiving wetland over 25 years, removing most of the natural filtration and flood-attenuation capacity the catchment once had. The resulting water-quality trajectory is measurable rather than speculative: the lake remains oligotrophic by Trophic State Index, but elevated nitrogen and phosphorus concentrations and a Secchi transparency of only 0.1–0.5 m point toward a modelled shift to eutrophic status within approximately 25 years if current conditions persist. These physical outcomes are not the product of a policy vacuum; Uganda's SDG 6, 11, 13, and 15 commitments already speak directly to water quality, urban sustainability, climate resilience, and ecosystem conservation, but implementation is fragmented across overlapping municipal, regulatory, and community mandates.

Taken together, the evidence supports the study's central claim: Kabaka's Lake is not an isolated site-specific problem but a representative case of what happens to spring-fed urban lakes across the Lake Victoria catchment when climate stress, unplanned urbanisation, and governance fragmentation compound one another. Because the lake sits beside a Faculty of Education, it also stands as a rare case where the same evidence base that supports technical intervention can be repurposed, largely unchanged, into a multi-semester curriculum for pre-service teachers — meeting the study's stated aim of linking hydrological and ecological research to place-based pedagogy rather than treating the two as separate outputs.

Summary of Key Statistics

Table 6. *Key quantitative findings referenced in the Conclusion, aligned to the study's stated purpose.*

Domain	Key Statistic	Relevance to Study Purpose
Climate	Warming of up to 1.5°C (1960–2009); ~0.2°C per decade	Establishes the climatic stressor component of the microcosm framework
Land use	+78.5% built-up area; ~92.2% wetland contraction (25 years)	Quantifies the urban-encroachment driver linked to filtration loss
Vegetated cover	−37.2% reduction (25 years)	Confirms catchment-wide loss of natural buffering capacity
Water quality	TN 10.5–15.3 mg/L; TP 1.00–2.37 mg/L; TSI < 40	Documents current oligotrophic-but-elevated status
Water clarity	Secchi transparency 0.1–0.5 m	Early indicator of incipient eutrophic stress
Projected trajectory	Eutrophic within ~25 years absent intervention	Provides the time-bound urgency underpinning the recommendations
SDG linkage	4 goals directly implicated: SDG 6, 11, 13, 15	Anchors the study's SDG-mapping objective

5. Recommendations

The recommendations below mirror the three components named in the study's purpose — technical management, governance reform, and pedagogical innovation — so that each traces back to a specific finding rather than standing as a generic best practice.

5.1 Policy and Governance (addresses the SDG 11.5 / governance-fragmentation finding)

- Establish a statutory catchment management committee for Kabaka's Lake, bringing together municipal authorities, environmental regulators, the university, and community stakeholders under a single mandate to regulate land use, enforce pollution controls, and monitor water quality.
- Gazette the remaining wetland footprint as a protected zone, remove encroaching structures, and implement phased restoration using indigenous vegetation to recover infiltration and nutrient-attenuation functions.

- Pair restoration with sustainable livelihood alternatives for displaced encroachers, so conservation does not proceed at the expense of local economic need.

5.2 Environmental Management (addresses the water-quality and hydrology findings)

- Pilot decentralised wastewater treatment — constructed wetlands or anaerobic baffled reactors — in the catchment to intercept untreated sewage and grey water before it reaches the lake.
- Establish a permanent monthly monitoring programme recording spring discharge, groundwater levels, nutrient concentrations, and algal biomass, closing the long-term data gap identified in the review.
- Incorporate recharge-enhancement measures — permeable surface retrofits and rainwater harvesting — into catchment climate adaptation planning.
- Link cyanotoxin public health surveillance to the ecological monitoring programme as the lake progresses along its eutrophication trajectory.

5.3 Pedagogy and Research (addresses the study's place-based education objective)

- Formalise Kabaka's Lake as a site for place-based teacher education, integrating water quality monitoring, catchment mapping, and community engagement across multiple semesters rather than a single module.
- Design the curriculum to pair technical ecological skills with critical analysis of water-access equity and the political economy of wetland encroachment, so graduates can engage with governance failures and not only measure them.
- Build community-engaged research partnerships that position the university as a facilitator of local stewardship through citizen science and restoration volunteering.

5.4 Limitations and Directions for Future Research

Four gaps constrain the comprehensiveness of this synthesis and should guide future primary research. Long-term hydrological monitoring data for Kabaka's Lake itself are limited to the single snapshot provided by Mutyaba et al. (2023); a permanent monitoring station is needed to attribute hydrological change to specific drivers with confidence. The ecological literature focuses almost exclusively on nutrient chemistry and trophic state, with minimal attention to aquatic biodiversity or food-web structure; comparative studies with other spring-fed urban lakes, such as those in Entebbe or Jinja, would clarify whether Kabaka's Lake's trajectory is typical or anomalous. The social dimensions of lake use and management remain underexplored, with no participatory research centring community knowledge and priorities. Finally, no peer-reviewed studies were found evaluating the implementation or outcomes of place-based environmental education at Ugandan universities specifically, despite Yemini's (2025) global evidence for its effectiveness — a gap that action-research partnerships between the Faculty of Education and environmental science departments are well placed to fill.

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