



INCORPORATING GENDER INTO GROUNDWATER: LESSONS AND REFLECTIONS FROM GESI ASSESSMENTS ACROSS THREE SHARED AFRICAN GROUNDWATER SYSTEMS



Food and Agriculture Organization of the United Nations



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- **Gender-blind groundwater projects fail.** Ignoring women's needs produces abandoned infrastructure, unresolved conflicts, and persistent inequality. Asking who uses water, how, and under what constraints is not optional; it is a precondition for water systems that actually work.
- **Access to groundwater is shaped by land, finance, and governance, and not just water availability.** Removing barriers to permits, training, and decision-making authority is as important as drilling the borehole.
- **Technical and social problems must be solved together.** Siting, water quality, governance, and equity are not separate workstreams; rather, they interact, and solutions that treat them in isolation will underperform.
- **Meaningful participation requires design, not just invitation.** Women must have a genuine voice in decisions on siting, tariffs, and management. This should be accompanied by flexible timing, inclusive formats, and documented decision rights, not token representation in a single meeting.
- **Investing in women as operators and managers strengthens systems for everyone.** When women hold financial authority, maintain infrastructure, and monitor water quality, service continuity improves, and accountability deepens. GESI is a performance strategy, not only an equity objective.
- **Transboundary groundwater governance must embed GESI from the outset.** Gender and social inclusion principles belong in planning, licensing, financing, and monitoring frameworks, not afterthought.

G4DR PROJECT BACKGROUND

The Groundwater for aDvancing Resilience in Africa (G4DR) project aims to demonstrate the benefits of groundwater-based planning for improving water security and resilience through targeted interventions in the Mono Basin (24,300 km²), shared by Benin and Togo, and the Shire Basin (32,000 km²), shared by Malawi and Mozambique as well as the Upper Nile Water Management Zone (UNWMZ, 50,000 km²) of Uganda. A key thrust of this project is to incorporate gender and social inclusion (GESI) into water management, including groundwater management and cross-border initiatives, to advance a range of worthwhile goals such as food security, climate resilience, and poverty reduction.

To support the incorporation of gender and social inclusion (GESI) into groundwater management in the Mono, Shire and UNWMZ, GESI assessments were conducted between April and November 2025.

The aim of this brief is to synthesise the key challenges, best practices, and key lessons emerging from gender assessments across the three regions.

The assessments were guided by four considerations: i) Context, ii) Gender and agricultural land and water uses, iii) Gender, sanitation, and health, iv) Decision-making and empowerment. Various data sources were consulted to obtain general information and insights into the basin, its people, and their livelihoods, with a focus on GESI and groundwater management. Additionally, field visits were undertaken in communities across the three regions to discuss pertinent issues in the context of: socioeconomics, education, land tenure, and poverty. The assessments proposed a targeted, realistic set of actions for the G4DR project to strengthen groundwater governance and embed GESI principles into water planning and management in the three systems.

WHY BRING GENDER INTO GROUNDWATER?

Groundwater is not a gender-neutral resource. Women and girls across the Mono, Shire, and UNWMZ are typically the primary collectors of water for their households, walking long distances, managing quality risks, and navigating infrastructure that was rarely designed with them in mind. At the same time, women are largely excluded from the decisions that shape how groundwater is managed: who controls boreholes, who sets tariffs, who holds permits, and who benefits from productive water use such as irrigation. This gap between who depends on groundwater and who governs it is not just an equity problem, it has direct consequences for whether water systems work, are maintained, and serve communities over the long term. Bringing gender into groundwater management is therefore not an add-on or a concession to outside pressure; it is a practical requirement for achieving water security, sustaining infrastructure, and reducing poverty across all three basins.

Efforts to incorporate women into water management range from the spectrum. At one end, conventional approaches make no deliberate effort to understand or accommodate women's needs, not out of malice, but simply because the question is never asked. A step forward is what practitioners call a gender-responsive approach: one that recognises women and men often have different needs, and actively adjusts project design to reflect this. Further still is a gender-transformative approach, which goes beyond accommodation to ask why women were excluded in the first place, and works to change the rules, norms, and structures that caused that exclusion. The table below illustrates how each approach plays out in practice.

“Women and girls across the Mono, Shire, and UNWMZ are typically the primary collectors of water for their households”



Approach	What it looks like	What it looks like
<p>Conventional</p> <p>Gender-blind Makes no deliberate effort to include women or understand their different needs</p>	<p>Treats all community members as identical. Women are assumed to benefit automatically from infrastructure built for the "community". Decisions on siting, tariffs, and management are made by default — often by men.</p>	<p>Women remain invisible in planning. Infrastructure is built, but fails in practice because it doesn't serve the people who depend on it most. Time burdens, safety risks, and exclusion from productive water use persist.</p>
<p>Better practice</p> <p>Gender-responsive Recognises that women and men have different needs and actively adjusts to accommodate them</p>	<p>Asks who uses water, how, and under what constraints. Adjusts project design in response: separate sessions for women, flexible training times, salinity testing, siting based on time-to-source, dual signatories on accounts.</p>	<p>Reduces the most visible inequalities. Infrastructure serves more people. Women gain access to meetings, training, and basic financial roles. Improvements are real, but the underlying power dynamics that caused exclusion remain in place.</p>
<p>Deep change</p> <p>Gender-transformative Aims to change the rules, norms, and power structures that cause exclusion in the first place</p>	<p>Asks who uses water, how, and under what constraints. Adjusts project design in response: separate sessions for women, flexible training times, salinity testing, siting based on time-to-source, dual signatories on accounts.</p>	<p>Lasting shifts in who holds power, controls resources, and sets the agenda. Women are not just included, they lead. Changes outlast the project because they are embedded in governance frameworks, norms, and economic structures.</p>





SUMMARISING GENDER ASSESSMENTS IN THE MONO, SHIRE, AND UNWMZ COMMON CHALLENGES



In the Mono, literature was reviewed in the first half of 2025, providing general information and insights into the basin, its people, and their livelihoods, with links to GESI and groundwater management. Additionally, we conducted field visits and spoke with community members in four communities to discuss pertinent issues. The goal of the discussions was not to gather extensive data, but rather to gain on-the-ground insights into issues already identified through data and literature. Field visits were undertaken in May 2025 in Houéyogbé and Athiémé, Benin, and in Datcha and Korikossa (Nangbeto), Togo. Box 1 illustrates how gender-blind design in productive groundwater interventions can deepen inequality, and how a gender-responsive redesign can expand women's access to irrigation, income, and decision-making.

BOX 1: PRODUCTIVE USE AND EXCLUSION IN THE MONO BASIN (BENIN/TOGO)

Problem. In the transboundary Mono Basin, groundwater supports dry-season market gardening. Women grow vegetables for sale, but men own most land and control access to motorised pumps. Women rely on hand-dug wells or bucket irrigation, limiting plot size and income. Formal groundwater permits exist but require land titles and bank accounts, barriers for most women.

Gender-blind response. A livelihoods project distributed 50 solar pumps on credit, using land title as collateral. Only 3 women qualified. Pump training was held in a male-dominated forum in a distant town. Maintenance contracts went to certified technicians, all men.

Outcome. Men increased the irrigated area and income. Women's relative position worsened. Some women rented water from men at high prices, reducing profits. A few pumps fell into disrepair because no local women were trained to fix them.

Gender-responsive redesign (next phase). A second project did the following:

- Offered group leasing of pumps (no land title required).
- Held separate women-only training sessions with flexible timing.
- Trained women as pump mechanics and spare parts sellers.
- Simplified permits: a group certificate instead of an individual land title.
- Linked women's irrigator groups to microfinance with mobile money.

Result. Women's irrigated area tripled. Five women now work as pump mechanics. Permit compliance increased because it became accessible. Conflicts over water allocation decreased.

Lesson Learned. Productive groundwater access is mediated by land, finance, and permits, not just water availability. Gender-responsive design removes those barriers directly.

In the Shire, various data sources were consulted on Malawi and Mozambique, which make up the Shire River Basin, in the first half of 2025. These sources provided general information and insights into the basin, its people, and their livelihoods, with links to GESI and groundwater management. Additionally, we conducted field visits and spoke with community members in two communities in April 2025: Chizenga Community and Paiva Community. Key examples of salinity risks and the potential for intervention redesign to mitigate them emerged (Box 2).

BOX 2: SALINITY AND SURVIVAL IN THE SHIRE BASIN (MALAWI)

Problem. In parts of the Lower Shire Basin, shallow groundwater has naturally high salinity, making it undrinkable. Women and girls walk up to 3 km daily to reach fresher wells or the receding river. During the dry season, salinity increases further, and queues at the few reliable handpumps exceed two hours. Men control deeper boreholes used for dry-season irrigation, leaving domestic users with unsafe or distant options.

Gender-blind response. A donor-funded project drilled 10 new boreholes using only standard siting criteria (yield and distance). Salinity was not tested before drilling; three boreholes produced brackish water and were abandoned. The remaining seven were placed near main roads for ease of construction, far from many households. Women were invited to one community meeting but had no vote on siting or tariffs.

Outcome. Women still walk long distances. Abandoned boreholes became safety hazards. Tariffs were set without consulting women, leading to payment conflicts. The project met its borehole count target but failed to reduce time burden or improve water quality.

Gender-responsive redesign (next phase). A second project did the following:

- Tested salinity during siting and avoided high-risk zones.
- Established shallow, low-salinity domestic wells separate from deep irrigation boreholes.
- Trained women as community water quality monitors.
- Required dual signatories (at least one woman) on water point bank accounts.
- Set maximum acceptable queue time as a performance indicator.

Result. Median collection time fell from 3 hours to 45 minutes. Women now co-manage tariffs and repairs. Salinity monitoring is routine. The project met reliability and equity targets.

Lesson Learned. Technical failure (salinity) became a gendered burden only because siting and governance failed to account for GESI. When salinity was treated as both a hydrogeological and a social problem, solutions worked for everyone.

In Uganda, we consulted various data sources on Uganda's Upper Nile Water Management Zone (UNWMZ) in the second half of 2025. These sources provided general information and insights into the basin, its people, and their livelihoods, with links to GESI and groundwater management. Additionally, we conducted field visits and spoke with community members in four communities in November 2025 to discuss pertinent issues. Each Focus Group Discussion (FGD) consisted of a maximum of 13 participants. The composition was designed to ensure a diverse representation of the community. Additionally, gender balance was strongly considered to ensure a robust discussion on GESI. At least 50% of participants were female and male across all categories. Cumulatively, four FGDs were held, and 48 participants were interviewed.

BOX 3: SUSTAINING INFRASTRUCTURE THROUGH INCLUSIVE GOVERNANCE (UGANDA)

Problem: Borehole reliability is a major concern in the UNWMZ, with non-functionality rates as high as 30%. Pumps often remain broken due to vandalism and slow repairs. Women, who primarily use the water and notice changes in quality, are marginalized in decision-making as Water User Committees (WUCs) are predominantly male. This exclusion limits community engagement and transparency in resource management.

Gender-blind response: Repairs are usually handled by a few trained men. When they migrate or are busy, water points often fall into disrepair. Women, often lacking technical skills and confidence due to lower levels of education, feel excluded from decision-making.

Outcome: When pump breakdowns occur, women and girls often must walk long distances to unsafe open wells shared with livestock. This increases their risk of waterborne diseases and exposes them to safety concerns, including the threat of Sexual and Gender-Based Violence (SGBV) along isolated routes.

Gender-responsive redesign: The assessment advocates for a strategic transformation in operations and maintenance that is attuned to gender-responsive principles.

- **Visual Training:** Redesigning technical training to use picture manuals and local language instructions (where possible) to accommodate women with lower formal education.

Strategic Participation: Advancing from token quotas to meaningful participation that values women's voices. This approach utilizes women's daily use of pumps/boreholes, enabling them to act as early detectors who can identify, report, and coordinate timely repairs.

Result: Empowering women in management and decision making ensures maintenance is prioritized. Their involvement in management structures helps detect issues early and minimizes downtime.



COMMON CHALLENGES – AND REMEDIES

Gender-blind decisions, that is, conventional approaches that make little effort to understand or include women's needs, do not only fail women; they undermine the technical and financial performance of water systems for entire communities. The failure modes documented across the Mono, Shire, and Upper Nile Water Management Zone share a common pattern: standard practices optimised for speed or cost consistently overlooked how different groups access, use, and govern water. When salinity goes untested, when water points are sited for construction convenience rather than user proximity, when tariffs are set without consulting those who pay them, and when permits require documents that most women cannot obtain, the results are abandonment, conflict, and entrenched inequality.

Each of these failures is both predictable and preventable. The gender-responsive remedies in the table below are not additional burdens; they are adjustments to standard practice that improve reliability, compliance, and equity simultaneously — applied at every stage of the groundwater service chain, from initial evidence gathering through to ongoing regulation and accountability.

Failure mode	Challenge (Gender-blind outcome)	Challenge (Gender-blind outcome)
Salinity not tested	Women walk further, abandoned wells	Test salinity pre-drilling; separate domestic and productive sources
Siting by construction ease	Water points far from users	Include time, safety, and accessibility in siting criteria
Tariffs without consultation	Arrears, conflict	Dual signatories, transparent accounts
A permit requires a land title	Women excluded	Group permits, simplified process
Training in male-only forums	Women cannot attend	Separate sessions, flexible timing, local venues
Maintenance requires certification	Women/youth excluded	Train local women and youth as mechanics





Key Lessons

- ✔ **Integrate GESI into diagnostics from the start.** Combine technical assessments (yield, quality, seasonal variability) with explicit analysis of who uses water, how they access it, and who makes decisions. Disaggregate all data by gender, age, and disability as a default.
- ✔ **Site infrastructure around users, not construction convenience.** Apply siting criteria that include time-to-source, safety, and physical accessibility. Test water quality (including salinity) before drilling, and set maximum acceptable collection times and downtime as project performance indicators.
- ✔ **Design for local maintainability and equitable access to maintenance roles.** Prioritise standardised, locally serviceable technologies. Build technician networks that actively include women and youth, with access to tools and spare-part supply agreements, and set clear escalation pathways for unresolved repairs.
- ✔ **Set tariffs and financial controls with women at the table.** Assess willingness and ability to pay by household type before setting tariffs. Require dual signatories on water point accounts, display finances publicly, and ensure women and youth can hold financial authority roles with appropriate training and oversight.
- ✔ **Make participation substantive, not symbolic.** Hold separate, flexibly timed community sessions at accessible local venues. Ensure women have a documented vote on siting, tariffs, and management arrangements. Record decisions formally and follow up on commitments made.
- ✔ **Remove structural barriers to productive groundwater access.** Replace land-title requirements with group permits and simplified licensing. Offer group leasing models for equipment and link women's irrigator groups to flexible microfinance. Assess whether compliance costs exclude smallholders before finalising permit frameworks.
- ✔ **Establish accessible grievance and accountability mechanisms.** Define decision rights explicitly across tariffs, procurement, repairs, and allocation, and ensure they are not concentrated without checks. Create grievance channels that women and marginalised users can safely access, and distribute decision-making authority to guard against capture.
- ✔ **Embed GESI indicators into monitoring and evaluation frameworks.** Report GESI and technical performance indicators together (e.g., water collection time alongside system downtime). Conduct after-action reviews following breakdowns, quality incidents, or tariff disputes, and use findings to drive adaptive management rather than simply meeting output counts.





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