

Advancing Women in STEM Leadership: Policy Analysis with Insights from Water-related Sectors in Ghana and Kenya

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Introduction

In sub-Saharan Africa (SSA), efforts to promote gender equality in workplaces have made progress, but significant gaps remain. The *Global gender gap report* (World Economic Forum, 2023) reveals persistent disparities, particularly in leadership in Science, Technology, Engineering and Science (STEM) fields. Women hold under 30% of middle and senior positions (Hanna et al., 2024) and are even less represented in high-level STEM leadership, with only 17.8% acting as Vice Presidents and 12.4% as Chief Officers (Hanna et al., 2024).

Many countries have ratified international and regional human rights instruments; however, a gap persists between these commitments and their actual implementation at the national level (UNDP & AUC, 2023). This is primarily due to slow implementation and a lack of supportive legislation and policy environments, which hinder the domestication and enforcement of these human rights instruments. Societal expectations, stereotypes and systemic biases further impede women's advancement to leadership roles (Mousa et al., 2021), particularly in patriarchal communities where traditional gender roles conflict with professional aspirations. Consequently, women's contributions remain underutilised, adversely affecting economic and social development (Nhamo

et al., 2018). While many studies have focused on the barriers to women's career progression, there is limited research on effective strategies to elevate women to leadership positions. Furthermore, there is a lack of systematic data to fully understand the interlinkages between education and career (Mousa et al., 2021), highlighting the need for targeted research to develop more effective policies and practices, especially in low- and middle-income contexts.

The importance of promoting women in leadership is especially evident in the WASH (water, sanitation and hygiene) sector. A World Bank (2019) report shows that out of 64 water and sanitation service providers in 28 global economies, women constitute just 18% of workers, 32% of these service providers have no female engineers and 12% have no female managers. Research indicates that involving women in water management significantly enhances project effectiveness and sustainability, with success rates increasing six to seven times compared to projects without female involvement (Jenniskens, 2022). Additionally, companies with more women in decision-making roles perform better, delivering social, environmental and economic benefits (Jenniskens, 2022).

Ghana and Kenya serve as compelling case studies for examining these challenges and opportunities, particularly within the water sector where women face numerous career bottlenecks (World Bank, 2019). One challenge is the gender imbalance in STEM training within higher education, which results in fewer women entering the workforce in these fields (Hammond et al., 2020). For example, at the University of Nairobi, between 2021 and 2023, only 42% of engineering students were female, with an even smaller percentage (22%) successfully graduating.¹ Similarly, in the Faculty of Science and Technology, while 51% of students who enrol are female, only 30% complete their studies. This gender disparity in engineering studies extends to and is exacerbated in the workforce, where only 7% of registered engineers in Kenya are women (Engineers Board of Kenya, 2023). Additionally, women scientists are more likely to work in academic and government institutions, while their male counterparts tend to be employed in the private sector, which generally offers better pay and career opportunities (The AAS, 2020). Similarly, at the University of Ghana, about 59.7% of graduates from the College of Basic and Applied Sciences in 2022 were male, compared to 40.3% female graduates.² Both Kenya and Ghana illustrate the systemic challenges that women face, including a lack of training, networking and mentorship opportunities, as well as pervasive socio-cultural

1 University of Nairobi student enrolment reports (Personal communication, 2022, 2023).

2 Based on published reports for 2022 from the University of Ghana, Institutional Research and Planning Office (IRPO) (see <https://irpo.ug.edu.gh/facts-figures>).

norms and gender stereotypes that limit their advancement (Boateng & Gaulee, 2019). This research aims to uncover policy gaps and identify opportunities to enhance diversity and equity by first providing an overview of policies related to women in STEM in both countries. It will then focus specifically on the experiences of women in the water sector.

We investigate whether current policy guidelines and practices in Ghana and Kenya are adequate not only to attract and retain women in STEM roles but also to facilitate their advancement into leadership positions. The main aim is to assess how national policies, legal frameworks and operational guidelines in Ghana and Kenya effectively support women's career progression and reduce attrition rates along the way. Drawing from the experiences of women and men within selected institutions, the study interrogates how these policies enable women's advancement in STEM careers and identifies barriers and opportunities that may cause women to leave these career paths or enable them to attain leadership positions.

The research is guided by three central questions regarding water sector-related institutions in both countries:

1. How have current national and institutional policies addressed the inter-linkages between gender, STEM and leadership?
2. What institutional policies or changes have either limited or supported equal opportunities and career advancement for women in water-related fields?
3. What specific opportunities can these policies provide to advance women into leadership positions in water sector-related institutions?

Methods

Research design

This qualitative study used a combination of secondary and primary data to assess the barriers and opportunities for women's advancement in STEM fields, particularly within water-related sectors in Ghana and Kenya. Secondary data analysis focused on policies and guidelines related to STEM, gender and the water sector, while primary data were gathered through in-depth interviews and key informant interviews. Secondary data, mainly in the form of reports, were sourced from official e-repositories and websites of national government ministries (such as water, sanitation, irrigation, health, education, social services, labour and social security), county websites and national council websites.

The inclusion criteria targeted public and private water sector institutions engaged in research and industry. Policies included in the analysis covered international and regional documents on STEM and gender, along with national policies and strategic frameworks on STEM, gender, education and the water sector. This approach aimed to evaluate how gender is mainstreamed into STEM and water sector activities, and vice versa.

Ethics approval for the project was obtained from the University of Ghana Ethics Committee (ECBAS 075/21-22) and Amref Health Africa's Ethics and Scientific Review Committee in Kenya (REF no: P1180 – 2022), in addition to a research permit by Kenya's National Commission for Science, Technology and Innovation (NACOSTI).

Study sites

In Ghana, data were collected from four case institutions within the water sector in Accra (i.e. academia, research, government and a coalition of non-governmental organisations). Additional data were collected from various government ministries and agencies. In Kenya, the study included faculty members from research and university institutions within STEM fields, professional bodies, academia and research institutions, government and parastatal agencies and industry, including water sector institutions and private sector institutions.

Data extraction methods

For research question one, content analysis (Hsieh & Shannon, 2005) was used to examine policies, development-related documents and strategic plans at the global, regional and national levels. A total of 27 documents (from Ghana) and 23 documents (from Kenya) were reviewed (see Table 1).

Table 1: Global, regional and national policies reviewed – Ghana and Kenya

Level of policy/document	Ghana	Kenya
Global	5 (13%)	5 (14%)
Regional	6 (16%)	6 (18%)
National	27 (71%)	23 (68%)
Total	38	34

For the second and third research questions, semi-structured in-depth interviews (IDIs) were conducted in Ghana with senior management (i.e. high-ranking staff and board members involved in institutional decision-making) and with

female and male leaders heading national, regional or departmental units of the four case study institutions (Table 2a). In addition, key informant interviews (KIIs) were conducted with six females and two males from four governmental ministries, identified through referrals when inquiries were made about appropriate contacts for the project's objectives. In Kenya, IDIs were conducted with four members of senior management and with nine female and six male leaders from the surveyed institutions (Table 2b). KIIs were also conducted with 88 female and 30 male participants holding various levels of responsibility across these institutions.

Table 2(a): Ghana – Leadership participants from surveyed institutions

Category	Academia	Research	Government	NGO
Senior management	3	3	5	2
Female leaders	7	4	5	1
Male leaders	2	5	3	3
Total	12	12	13	6

Table 2(b): Kenya – Leadership participants from surveyed institutions

Category	Water sector institutions	Professional body	National government and parastatals	Private sector
Senior management	1	1	1	1
Female leaders	4	0	2	3
Male leaders	2	0	2	2
Total	7	1	5	6

Data analysis

The SAGA Policy Matrix (UNESCO, 2017) framework was used to evaluate the extent to which various policies implemented by institutions promote gender equality in science, technology and innovation (STI), including policies and policy instruments that have a differential impact on gender equality. While the SAGA Policy Matrix uses the term STI, this is often used interchangeably with STEM in many contexts. For consistency within this chapter and the broader collection, we refer to STEM where appropriate. The analysis considered several factors, including the nature of the policy, the implementing body, the type of policy, STEM objectives to which the policy contributes, target beneficiaries, implementation period, geographical coverage and target Sustainable Development Goals (SDGs).

For qualitative data, framework analysis (Gale et al., 2013) was employed using NVivo 12 (QSR International, Australia) and QDA Miner (Provalis Research, Canada) for coding and analysis. Researchers familiarised themselves with the data by listening to recordings and reviewing transcripts. To ensure reliability, two researchers independently developed a coding framework, followed by a consensus meeting to finalise the themes. The data were then coded, charted, mapped and interpreted based on the developed framework. The analysis framework was structured on the following two levels:

1. First-level analysis variables:

- Document title, type and level (global, regional or national).
- Policy analysis variables: “Evidence” (presence of STEM or gender equality), “Context” (historical or structural objectives), “Engagement” (main stakeholders).
- Gaps: Identified STEM and gender gaps.

2. Second-level analysis variables:

- Document jurisdiction (global, regional, national).
- Focus areas: STEM only, gender only, STEM and gender, STEM, gender and leadership.

Results

This section responds to the three central questions that aim to assess policy gaps and opportunities for enhancing diversity and equity in STEM leadership based on literature and the experiences of participants from water-related sectors in Ghana and Kenya.

National and institutional policies and interlinkages with gender, STEM and leadership

National gender policies in both Ghana and Kenya have shaped institutional mechanisms aimed at promoting gender equality and supporting women’s empowerment. In both countries, the establishment of Gender Desks (or gender focal points) across various ministries has played an important role in increasing the representation of women and providing support for their educational and professional development. These units or designated contact points focus on promoting gender equality and mainstreaming gender considerations into their organisational policies and practices (see Chapter 3 for an in-depth discussion of gender mainstreaming). In Ghana, since the establishment of the Ministry

of Gender, Children and Social Protection and the promotion of Gender Desks in various ministries, there has been a noticeable increase in the number of women directors and enhanced support for women's empowerment, including educational sponsorship –within two years of implementing the Gender Desk, the numbers increased from four to 10 out of the current 36 directors.

Similarly, in Kenya, the Ministry of Gender, Culture, Arts and Heritage, through the State Department for Gender and Affirmative Action, has worked towards creating a society free from gender discrimination and violence. Gender Desks have been established in various institutions, including the University of Nairobi, which became the first institution of higher learning to launch a Gender Desk in 2022. This initiative addresses the prevalence of unreported cases of gender-based violence and aligns with international efforts, such as UNESCO's O3 Plus initiative, which aims to create awareness and provide support to young people in universities and tertiary institutions (UNESCO, 2024).

Despite these positive steps, there is a substantial *lack of integrative policies* that effectively combine gender, STEM and leadership, and significantly limit the advancement of women into leadership roles. First, most STEM-related policies and strategic developmental documents *are not fully gender-mainstreamed*. These documents often emphasise access to and use of technologies and equipment but lack gender mainstreaming, in that they fail to consider the specific needs and challenges faced by women and other vulnerable groups, such as persons with disabilities. Without explicit gender mainstreaming, these policies overlook the broader societal and cultural contexts that influence women's participation and progression. For example, policies that merely aim to increase technological access without addressing the systemic biases and barriers women face are unlikely to be effective.

Second, social development documents, including national programmes and strategic plans, often treat technology and STEM-related initiatives *as secondary or supportive components* rather than as central elements for achieving broader developmental goals. This approach minimises the critical role of STEM education and careers in supporting social and economic development. Policies that view STEM only as an 'accessory' fail to recognise its potential to drive social change and economic empowerment, particularly for women who remain underrepresented.

Finally, there is a *disconnect between government STEM educational policies and national employment policies* concerning female STEM employees. In both Ghana and Kenya, there are gender-mainstreamed educational policies designed to encourage girls and women to pursue STEM education. However, these policies are not sufficiently linked to employment strategies that would ensure women's

retention and progression. For instance, in Ghana, although some policy documents mention the goal of increasing the number of female STEM students from primary through tertiary education, there is a lack of specific policies that ensure the transition of female graduates into STEM-related job fields and leadership roles. Policies such as the National Vision for Girls Education in Ghana and the National Science, Technology and Innovation Policy lack mechanisms to support the absorption of women into the STEM workforce and their advancement into leadership positions. Similarly, while Kenya's Education Act of 2013 has been successful in promoting gender equity in education, there is insufficient alignment with employment policies to support women's career progression. This disconnect and lack of coherence between education and employment policies result in a significant drop-off or 'leakage' of women from the STEM pipeline, as they exit STEM career paths due to lack of opportunities and support for career advancement.

Policy structures supporting and limiting career advancement for women in STEM

In both countries, *positive* institutional policies and structures include the establishment of gender advocacy centres and unions, gender-sensitive recruitment policies, implementation of inclusive workplace environments, family-friendly policies, in-house support programmes to help women advance their careers, as well as mentorship and capacity-building programmes.

Gender advocacy centres within institutions in both countries have been crucial in promoting gender equality and addressing gender-related issues. The Centre for Gender Studies and Advocacy (CEGENSA) at the University of Ghana is dedicated to policy development, advocacy and creating a supportive environment for both men and women. CEGENSA has been instrumental in drafting and ensuring the implementation of the Sexual Harassment and Misconduct Policy and the Gender Policy, ensuring that gender issues are mainstreamed across the university. Similarly, women's unions, as found in the Ghana Water Company Ltd. (GWCL) and Women in WASH (WIWASH) in both countries, serve as powerful advocacy groups. They also engage in community outreach to educate and inspire young girls about opportunities in STEM fields, address important issues such as hygiene and advocate for the advancement of women within their institutions. As highlighted by a female leader in Ghana's public water sector:

We're pulling the engineers, those with the science background, to propagate STEM education. We do a lot of programmes to whip up interest in the WASH sector like this Menstrual Hygiene Day which is in May. We do hygiene education, ... and educate them on courses, that they can pick up in the sciences that will enable them to pursue a career in the water sector ... We also train women to pick up leadership roles to ensure that we're not just in the WASH sector, but our voices can be heard.

In Kenya, several water sector institutions have implemented gender-sensitive recruitment policies to increase the representation of women in technical and leadership roles. These policies set specific gender targets or quotas to promote gender parity in hiring practices. For instance, the Water Services Regulatory Board (WASREB) and Kenya Water Institute (KEWI) have made deliberate efforts to ensure gender parity in their hiring practices, leading to a more balanced workforce and providing women with greater opportunities to progress.

Efforts to create inclusive workplace environments that actively challenge gender stereotypes and promote diversity are evident. Some water sector institutions have established gender committees or task forces that regularly review and recommend changes to organisational policies and practices. Six participants reported the presence of gender committees in their institutions.

Additionally, family-friendly policies have been adopted by some institutions to enable women to balance their professional and personal responsibilities, thereby reducing the likelihood of career interruptions. For example, ten participants from the water sector in Ghana reported that their organisations had implemented flexible working hours, remote work options and job-sharing. The initiative not only supports work-life balance but also encourages the retention of women in the workforce, especially those who may otherwise leave their careers due to family obligations. A female leader in the public water sector explained,

... what we have is that when you resume from your maternity leave, you close two hours earlier than the normal time. And the policy is such that if you stay at home, like I did for six months, I have one year from the day I resume to close two hours before time. Yes. So that is there ... at this point in life, it makes work-life better

Institutional leaders sometimes go beyond statutory requirements to offer additional benefits that support women's career progression and work-life

balance by implementing in-house supportive policies through their personal leadership strategies and creating an inclusive work environment. For example, at three institutions in Ghana, internal policies extend beyond national statutory provisions to offer additional benefits like nursery facilities and ‘nanny allowances’ for work-related travel. These in-house measures have been instrumental in enabling women to sustain their career progression, particularly in the water sector, where field experience is essential for advancement. As noted by a female NGO leader in Ghana:

We can do two weeks at a place and ... well they have this nanny support where if you are a nursing mother, for the first six months after delivery, upon resumption [of work], when you have to go to the field ... [the institution] will bear half the cost of the nanny’s PDM [per diem] and accommodation.

This commitment to supporting women’s professional growth is also reflected in leadership attitudes within these institutions. As one male public senior manager in Ghana noted:

So, that is how this present MD [managing director] has distinguished himself. You see, most of them [women] are not engineers. And in this company, it is all about engineering. So, ideally, the top should be occupied by engineers. But this present MD, said no. So now, when you even look at some of our policies, we are saying that ideally, for a position to be vacant, if a woman is qualified, the woman should be considered first.

The introduction of mentorship and capacity-building programmes is a supportive measure. Organisations like the Rural Water Supply Network (RWSN) and Kenya Water and Sanitation Civil Society Network (KEWASNET) have established mentorship initiatives that pair young female professionals with experienced leaders in the sector (see Chapter 7 for a discussion of a regional mentorship and supervision framework). These programmes offer guidance, knowledge sharing and networking opportunities, which are crucial for women seeking to advance in traditionally male-dominated fields.

Despite these supportive measures, some critical gaps and challenges persist at the institutional level, which hinder the career advancement of women in their fields. These include the lack of awareness of policies and guidelines, the lack of or ineffective implementation of policies, the lack of clarity in

policies and guidelines, and the inadequacy of policies to address issues specific to women.

Many study participants reported insufficient knowledge or inadequate awareness of gender-related policies in their institutions, which impedes effective implementation and reduces potential impact. The effectiveness of STEM policies and guidelines is often dependent on successful awareness creation. As a female key informant from one of Ghana's ministries noted: *"You know Ghana, we have all the laws. But we don't read them and we don't know. We have signed conventions [that] we are not aware of ... I think it is an eye-opener to know our policies."* Similarly, in Kenya, the need for sustained awareness efforts was emphasised by a senior female key informant: *"One-time awareness campaigns may not be sufficient to foster lasting understanding and support for STEM policies ... requiring ongoing efforts of key messages."*

Even where well-intentioned policies exist, their lack of effective implementation to ensure compliance often extends gender disparities rather than reducing them, resulting in gaps between policy intentions and actual outcomes. A Kenyan senior female key informant noted that: *"Low implementation of existing policy guidelines to support women in STEM has been the order of operations in many institutions. Not only in our place but in many other institutions where my colleagues work."*

Without clear and enforceable guidelines to ensure compliance, many organisations do not prioritise the necessary changes that are needed for an equitable work environment. A male participant from Kenya highlighted that: *"In the water sector, I have seen the importance of robust enforcement of policies supporting women in STEM. Without it, even strong policies can fail, as organisations may not prioritise gender equity. Effective enforcement and regular assessments are essential."*

This challenge is compounded by funding constraints, as noted by a female key informant from one of Ghana's ministries: *"It all boils down to funding. But when we [don't] have the resources, at times we just fall on our donors to sponsor, and they do."*

In addition, the lack of clarity in policy guidelines presents a significant challenge. Many participants indicated that ambiguous language in policy documents makes it difficult to interpret and translate policies into actionable steps. The importance of both clarity and enforcement was underscored by a female Kenyan participant: *"Language of policy is important in the implementation. Sometimes we do not even understand the language used in the policy and there is no way we will educate others on what we do not know much about."*

Finally, study participants emphasised that the current policies and guidelines addressing women in STEM are inadequate, as they often fail to account

for the unique challenges faced by women with multiple marginalised identities, such as those based on race, socio-economic status, disability or geographical location. For example, a policy designed to support women in STEM may provide general measures for gender equity but might not consider the additional barriers faced by women from rural areas who may lack access to quality education and mentorship opportunities. Similarly, policies in engineering fields frequently do not consider the specific needs of women who are unable to perform strenuous manual tasks, such as lifting heavy machinery or climbing high buildings, due to physical limitations or health concerns.

By failing to consider these specific needs, policies inadvertently reinforce a one-size-fits-all approach that does not account for the varied capabilities and contributions of women in the water sector and other STEM fields. In Kenya, a female participant underscored this issue, stating: *“Policies on women in STEM often miss the mark by not addressing the unique challenges faced by those with multiple marginalised identities. To truly promote inclusivity, we must recognise and address these intersectional factors.”*

Institutional policies supporting women’s advancement into leadership roles

The research highlights policies that support women’s advancement into leadership positions in the water sector. These focus on structured mentorship, professional development, gender diversity targets, advancing inclusive organisational cultures and enhancing research and data collection.

Advancing women to take up leadership roles in the Ghanaian and Kenyan water sectors requires targeted policies and initiatives, particularly in mentorship programmes. Participants reported how women often faced challenges in breaking into senior roles due to a lack of networks and guidance. As such, they emphasised the need for structured mentorship initiatives that provide aspiring women leaders with valuable career advice, networking opportunities and visibility within the industry, as a female sector leader in Kenya underscored: *“Mentorship has been a game-changer for many women in our sector. It not only provides guidance but also opens doors to networks and opportunities that are crucial for career advancement and are challenges faced by women in STEM.”*

Similarly, participants in Ghana reiterated the importance of mentorship, noting how such support could help women avoid common pitfalls and accelerate their career growth. As one female leader mentioned: *“I would have wanted to be mentored in this place if there was a senior female leader because once you get the mentorship, you’ll skip some mistakes ...”*

Beyond mentorship, there is a clear need for policies focused on professional development and leadership training opportunities. Participants highlighted the necessity for women to access specialised training to prepare them for leadership roles, including skills development in management, strategic thinking and decision-making. These programmes should be designed to build confidence and competence, equipping women with the tools necessary to excel and remain in leadership positions. Female participants in Kenya emphasised how prioritising such development opportunities, could better equip women with the skills needed to lead effectively:

To prepare women for leadership roles, we must invest in specialised training that enhances their skills in management, strategic thinking and decision-making. The training ought to build the confidence necessary for women to step into and thrive in leadership positions.

Moreover, initiatives such as the DANIDA Project in Ghana, which specifically targets women for knowledge transfer and coaching at the ministries, demonstrate the positive impact of tailored professional development programmes. A female key informant from one of the ministries described their approach:

The DANIDA Project targets only women ..., they are coming to transfer the knowledge. They are coming to coach the younger generation so they can also take up after us. When we came, we also organised a session to share our experiences

The findings also illustrate the need for policies supporting gender diversity targets and quotas, which can drive systemic change. In Kenya, a female participant described how establishing clear targets for women's representation in leadership roles ensured accountability and provided a structured approach to increasing diversity and balanced representation in leadership positions: "Setting clear targets for women's representation in leadership roles creates accountability and fosters a more inclusive environment. It helps to address the systemic biases that have traditionally hindered women's advancement in the water sector."

Similarly, in Ghana, there have been efforts to increase women's representation at the science and research levels. As a male senior manager in research explained:

Yeah, there's some improvement in inclusivity. For some time, the ratio of women to men, let's say, was very, very low. But in recent times, there's

been an effort to increase the number of women at the science and research level. So usually when you have two people [competing] at a level, it's likely the woman will get it ...

Participants also described the need to develop an *inclusive organisational culture*, reiterating the need to adopt and implement policies that promote a culture of respect and equity, where women contribute to ideas and lead projects and programmes. According to the participants, this included adopting and implementing anti-harassment measures, ensuring fair evaluation processes and supporting women in negotiating for fair compensation and promotions. As described by a female leader in Kenya: *“An inclusive culture where women feel valued and supported is crucial for their success. This means implementing strong anti-harassment policies, ensuring fair evaluations and supporting women in negotiating for promotions and fair compensation.”*

Additionally, creating opportunities for women to lead is vital, as a Ghanaian female leader in academia recommended:

So, I would suggest that women should be given the opportunities to lead. And I believe it will help very well. Because women pay particular attention to issues ... if they get them involved, the output will certainly be great.

Finally, participants emphasised the importance of collecting gender-disaggregated data during recruitment exercises and other data-collection processes to inform decision-making. Such data is crucial for analysing women's participation and progression to STEM leadership positions and enhancing policy guidelines that support their advancement. The need for dedicated funding for research on the barriers faced by women in STEM was supported by participants from both countries. In Kenya, a female leader suggested: *“Mandate the collection of gender-disaggregated data on STEM employment, leadership positions and pay. Allocate dedicated funding for research on the barriers faced by women in STEM and the development of evidence-based policies.”*

Policy recommendations

To advance gender equality and support women's progression to leadership positions in water-related sectors in both countries, we propose five key policy recommendations to enhance gender equity by promoting a more inclusive environment (Table 4).

Table 4: Policy focus areas with proposed actions, expected outcomes and considerations necessary for effective implementation

Policy focus	Proposed actions	Expected outcomes	Implementation considerations		
			Challenges	Solutions	Stakeholders (see Annex. 1)
Enhance policy awareness and participation in policy processes	Restructure promotion processes. Gender-based violence prevention and response measures. Robust monitoring and evaluation frameworks. Work-life balance policies. Inclusive policy participation.	Increased awareness and understanding of policies. Enhanced representation in policymaking processes. Improved gender equity through better monitoring, evaluation and accountability measures. Greater retention and career progression of women in STEM fields.	Potential resistance from existing institutional structures. Limited access to training and resources for women to engage effectively.	Provide training workshops on policy engagement for women. Allocate resources for sustained advocacy and awareness campaigns.	Collaborate to implement initiatives: Government ministries (e.g., ministries of education and gender), Parliamentary Committees on Gender, National Gender and Equality Commissions.
Develop and implement formalised mentorship programmes	Celebrate women's achievements. Implement formal mentorship programmes.	Increased retention and advancement of women in STEM. Strengthened professional networks and reduced feelings of isolation. Creation of a supportive community that encourages career progression and leadership development.	Establishing a sustainable mentorship framework. Ensuring sufficient participation from senior professionals.	Incentivise participation through recognition programmes and career development opportunities for mentors. Engage private sector and professional bodies in mentorship initiatives.	Lead development and implementation of programmes: Private sector organisations, Water sector institutions, Professional bodies and networks.

Policy focus	Proposed actions	Expected outcomes	Implementation considerations		
			Challenges	Solutions	Stakeholders (see Annex. 1)
Provide capacity-building and training opportunities	Provide scholarships and training. Implement comprehensive training programmes. Support re-integration for new mothers. Inclusive training for all genders.	Improved skills and competencies among women in STEM, enhancing their readiness for leadership roles. Increased visibility and participation of women in leadership positions within the water sector. Greater workplace inclusivity and more supportive policies.	Financial constraints in funding extensive training programmes. Cultural resistance to women in leadership.	Partner with international organisations and NGOs for funding. Create awareness campaigns highlighting the benefits of gender diversity in leadership.	Collaborate to provide training and opportunities: STEM educational institutions, Government ministries, Professional bodies and networks.
Promote flexible work arrangements	Introduce flexible work policies. Support for new mothers.	Improved retention rates of women in the water sector. Enhanced work-life balance for women, leading to increased participation in leadership roles.	Potential pushback from traditional management structures. Difficulty in managing remote or flexible teams.	Provide training for managers on leading flexible teams. Use technology to facilitate remote work and collaboration.	Adopt and promote flexible arrangements: Private water sector institutions, Government ministries, Private sector organisations.
Data collection and monitoring for gender equity	Develop a comprehensive data collection and monitoring system. Facilitate collaboration and transparency in data sharing and policy evaluation.	Comprehensive data collection clearly shows gender disparities within STEM. Intersectional analysis will enable more precise and effective interventions. Regular monitoring and evaluation frameworks will create accountability. Collaboration and data sharing among stakeholders will encourage a unified approach.	Data privacy and security concerns, standardisation challenges, resistance to data collection efforts and potential lack of capacity for analysis. Difficulty in coordinating data sharing and collaboration among diverse stakeholders.	Ensure compliance with laws and ethical guidelines. Develop standardised data-collection protocols. Provide training and resources. Establish clear communication, define roles and responsibilities.	Develop and enforce collection protocols and share best practices: Government ministries, STEM educational institutions and private sector organisations, Professional bodies/networks/women's groups/platforms.

Policy awareness and participation in policy processes

Awareness of policy and participation in the policy process allow us to directly confront the challenge of deeply rooted socio-cultural norms by promoting a culture of shared responsibility and advocacy. Roles for women in policy awareness programmes and their participation in policy processes are crucial for achieving gender equality and promoting inclusive governance. By actively participating in policy processes such as those outlined below, women can ensure that their unique perspectives and experiences are considered in the formulation and implementation of policies.

- Restructuring promotion processes and providing sufficient resources for research to guarantee women have equal opportunities for advancement.
- Coordination and enforcement of gender-based violence prevention and response.
- Robust monitoring and evaluation frameworks to track progress and ensure accountability in gender equity initiatives.
- Policies on working hours and childcare support.
- Policy participation processes for both men and women that promote a culture of shared responsibility and advocacy.

Formalised mentorship programmes in institutions to support women's career progression

The research showed that informal mentorship played a critical role in encouraging many women, with guidance, support and role models. Formalised mentorship can therefore facilitate career progression, build professional networks and overcome feelings of isolation often experienced by women in male-dominated fields. This can be achieved through policies that:

- Highlight and celebrate the achievements of women who have broken through barriers in STEM fields. These success stories serve as powerful inspirations and provide tangible examples of what is possible, encouraging other women to pursue similar paths.
- Develop and implement formal mentorship programmes aimed at supporting women in water-related sectors. These programmes can leverage the positive experiences and outcomes observed from informal mentorship practices in both Ghana and Kenya, providing a structured approach to mentorship that ensures consistency and widespread access.

Capacity-building and training opportunities

Capacity-building and training opportunities are essential for ensuring that women can compete on an equal footing with their male counterparts. As the job market rapidly evolves, there is a need to address the disparities between men and women in accessing enhanced learning and technical knowledge. Women need to be equipped with the necessary tools to succeed in leadership roles. This can be achieved through policies that:

- Provide scholarships, networking opportunities and targeted training, to enhance women's capacity and visibility.
- Implement training programmes that cover a range of essential skills, including negotiation, leadership roles, understanding institutional environments, cultural norms and influences, and work-life balance. These programmes are crucial for equipping women with the tools they need to succeed and advance in their careers.
- Provide re-integration programmes for returning new mothers to ensure a smooth transition back into the workforce. These programmes should offer training and resources to help new mothers balance their professional and personal responsibilities effectively.
- Encourage both men and women to participate in programmes that promote understanding of the departmental climate and collegiality relative to gender differences. Such inclusive training promotes a supportive work environment that helps to break down gender barriers and promotes a workplace environment where all employees feel valued and supported, regardless of gender.

Promote flexible work arrangements

Flexible work arrangements are essential for retaining women in the workforce, especially those with caregiving responsibilities. Such policies help women remain engaged and progress in their careers without compromising their work-life balance. This can be achieved through policies that:

- Offer flexible work hours, remote work options and job-sharing to help women balance professional and personal responsibilities.
- Establish re-integration programmes for new mothers to support their smooth transition back into the workforce.

Data collection and gender equity in STEM monitoring for policy and tracking progress

Without accurate, gender-disaggregated data, career progression and leadership attainment, policies aimed at promoting gender equality cannot be effectively formulated, implemented or evaluated. This policy focus addresses the need for comprehensive data collection systems that provide a clear understanding of the current state of gender equity, as well as the effectiveness of ongoing interventions. It is, therefore, crucial to implement the following actions:

- Establish standardised protocols for collecting gender-disaggregated data at all levels of the workforce, including recruitment, retention, promotion rates and pay equity. Incorporate monitoring of gender diversity targets and quotas into regular data-collection efforts to assess progress and identify areas needing improvement.
- Strengthen collaboration and transparency in data sharing among institutions and stakeholders to better identify gaps, measure progress and share best practices towards achieving gender equity in STEM fields.

Conclusion

This chapter highlights key insights regarding the linkages between gender, STEM and leadership in Ghana and Kenya. While national and institutional policies have made strides towards promoting gender equality, such as establishing Gender Desks and implementing gender-sensitive recruitment practices, significant gaps remain. These policies often lack comprehensive integration of gender, STEM and leadership components, with limited connections between educational initiatives and employment strategies. This limits efforts to support women's advancement in STEM fields and into leadership roles.

Supportive institutional policies, such as mentorship programmes, professional development and leadership training, flexible work arrangements and gender diversity targets, have shown positive impacts. However, challenges persist due to poor policy implementation, inadequate awareness, ambiguous guidelines and insufficient consideration of the unique barriers faced by women from marginalised backgrounds. Many of these recommendations can be applied to other contexts, although their successful adaptation will require careful consideration of local socio-cultural norms, economic conditions and institutional capacities. For example, flexible work arrangements or mentorship programmes may need to be tailored to account for resource constraints,

organisational structures or the specific challenges faced by women in different industries, such as healthcare or education.

Finally, for these recommendations to be effective, robust mechanisms must be established to ensure policy implementation, monitoring and evaluation. Regular assessments, stakeholder engagement and collaboration between government, the private sector and community organisations are essential to adapting and scaling these strategies across diverse contexts. These offer a pathway for promoting a more inclusive environment that supports women's leadership in STEM and leadership globally.

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Annexure 1: Key stakeholders and targeted institutions

Stakeholder institution	Role	Examples of institutions
STEM educational institutions	Incorporate findings into policies to support women in STEM.	Technical colleges, universities (e.g. University of Nairobi, Kenya Institute of Science and Technology)
Parliamentary Select Committee on Gender	Monitor and mainstream gender equality at national and parliamentary levels.	Parliamentary committees on gender and equality in national assemblies
National Gender and Equality Commission	Advise on and ensure equality and discrimination principles in policies and regulations.	National Gender and Equality Commission of Kenya
Government ministries	Inform educational and professional policy-making to support women in STEM fields.	Ministry of Education, Ministry of Gender, Children and Social Protection
Private sector organisations	Implement mentorship, flexible work policies and gender-responsive recruitment for women in STEM.	Technology providers like Jenga and Safi Organics and investment funds and development organisations such as Water.org
Water sector institutions	Enhance water services and promote women in STEM leadership.	Ministry of Water and Sanitation, NGOs, public utilities
Professional bodies/networks/women's groups	Advocate for gender provisions in STEM policies through awareness and platforms.	Kenya Water and Sanitation Civil Society Network, Women in Water and Sanitation Association
Water sector institutions (public/private)	Recommend and promote women in STEM leadership.	Private companies such as Rural Water Focus, Runda Water and bottled water firms like Dasani Water