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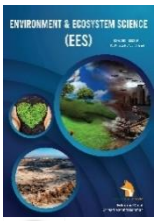

RESEARCH ARTICLE

THE ROLE AND CHALLENGES ENCOUNTERED BY WOMEN IN SUSTAINABLE WATER MANAGEMENT IN SUB-SAHARAN AFRICA

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ABSTRACT

Water is a basic human right that is essential for survival and human wellbeing. However, women have disproportionate rights to collection, access and distribution of the resource in good quality compared to men. This review explores the challenges that women of Sub-Saharan Africa (SSA) region face in their water roles and the overall impact of the issues on sustainable water management (SWM). Findings showed that women as primary water collectors are burdened with the resource's administration roles and face various dangers, risks, vulnerabilities and health etiologies in their quest to access water points. These include the risks of falls, body aches and slips, attacks by assailants and animals, kidnaps and sexual abuse by domineering males, fear and anxiety as well as spousal violence due to inadequacies in providing enough water. The tendencies are more pronounced in rural settings and are attributable to social-cultural norms of the region. SSA men perceive women as their subordinates and hence, their disempowerment, inequitable treatment and their apparent discrimination in water responsibilities compared men. Moving forward, the need to deconstruct gendered water by involving women in water governance, improving water infrastructure, revision of water management policies and having gender-shared water responsibilities are emphasized to drive SWM and sustainable development at large.

KEYWORDS

Gender; Sanitation; Rural Sub Saharan Africa; Sustainable water management; Water collection; Women

1. INTRODUCTION

Although water is the one of the most abundant resources occupying more than 60 % of the earth's surface, many countries around the globe consider its access in safe and clean condition a privilege (Onu et al., 2023). More than 4 billion people, equivalent to 60 % of the global population live in water-stressed and water-scarce regions, where water abstraction from both ground-and surface-water have surpassed the available supply (Nyika and Dinka, 2022). Likewise, noted that about 663 million people do not have access to safe water while at least 2.7 billion people experience chronic water shortages (Matchawe et al., 2022). Water scarcity, which is often exacerbated by pollution, poor wastewater treatment, growing industrialization, urbanization and population explosion is now rated as one of the greatest challenges of humanity (Nyika, 2022; Nyika and Dinka, 2023). In addition to anthropogenic challenges, water scarcity is exacerbated by other factors such as drought, rainfall deficit and climate change.

In sub-Saharan Africa (SSA), more than half of the population accounting for about 160 million people are disadvantaged in accessing safe and adequate water for drinking, consumptive and environmental uses (Matchawe et al., 2022). Compared to other parts of the world, the region is disadvantaged as shown in Table 1. Ritchie and Roser (2019) noted that more than 50-60 % of rural and urban population in SSA have no access to improved drinking water. The trend is a big impediment to improved health and welfare of the general population as well as efforts towards poverty eradication. A recent report by the World Health Organization and the United Nations Children's Fund noted that more than 350 million people in SSA, especially in rural settings had no access to drinking water and basic water services while only 30 % of the region's population had access to safely managed water (WHO and UNICEF, 2021).

Table 1: A comparison of water access in SSA region to the world (WHO and UNICEF, 2021; Nyika and Dinka, 2023, 2024; World Bank Group, 2024)

Metric	Sub-Saharan Africa	Comparison with other regions of the world
Access to basic water services	As at 2022, more than 226 million people did not have access to basic water services.	Other regions have better infrastructure and access rates are higher.
Rural and urban access	Access to safe drinking water in rural areas is undeserved compared to urban areas whereby, the latter is much higher.	The gap between access to water services in rural and urban areas is significantly smaller.
Access to improved water sources	Access to improved water services is slowly rising but varies depending on the country.	A high percentage of access to improved water sources is evident due to infrastructural development.

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Table 2 (cont): A comparison of water access in SSA region to the world (WHO and UNICEF, 2021; Nyika and Dinka, 2023, 2024; World Bank Group, 2024)		
Key challenges	Poor and obsolete water and wastewater networks leading to contamination and poor sanitation, which is worsened by climate changes.	The issues are less prevalent since there is good water governance and infrastructure.

The scope of water scarcity in the region extends to four dimensions according to (Nyika and Dinka, 2023). In the first dimension, water supplies from various resources are insufficient to meet the demands of today and the future while in the second dimension, there are financial limitations, which impede the supply and distribution of available water in an improved form to target users. The third order describes institutional and infrastructural limitations that impede water supply to and access by users. In the last order, water scarcity is attributable to social disparities that emanate from differences in location of users (rural or urban), financial status (rich or poor) and as a result of gender constructions and biases.

As a result of gender construction and biases, SSA has a gendered water system where girls and women have a major responsibility in sourcing for water and a minor role in making decisions on the sharing and use of the resource. Such a tendency derails efforts to realize sustainable development goals (SDGs) 5, 6 and 10 on gender equality, clean water and sanitation access and alleviation of discrimination through reduced inequalities in respective order (Fleifel et al., 2019). Additionally, the trend undermines the global role of women to contribute to religious, cultural, economic, political and social growth as pointed out due to divided attention since females have to figure out where and how to access water (Mojumder, 2020). Consequently, women and girls spend most of their learning and working time fetching water from waterpoints that are located distances away from their homes and involve long walks in harsh terrains (Nyika and Dinka, 2023).

Other authors also noted that women and children play a major role in fetching water from distant sources while men only assist if advanced conveyance technologies such as cars, bicycles and carts are used (Fletcher and Schonewille, 2015; Van Koppen, 2017; Sutton and Butterworth, 2021). In another study, noted that women were vulnerable to spousal abuse if they were unable to provide adequate and clean water or complete households tasks that involved use of the resource (Pommells et al., 2018). A study in 26 SSA countries established a positive correlation between increased prevalence of intimate partner violence (IPV) against women and longer round-trip water fetching time associated with fatigue and health problems during water collection (Bachwenkizi et al., 2023). The disproportionate trend leads to economic losses in the region and globally. Ultimately, the trend makes women and girls vulnerable to physical injuries, security threats, psychosocial complications, socio-economic challenges and sexual exploitation during the search for clean and safe water compared to males (Cooper-Vince et al., 2017; Apatinga et al., 2022). Once they fetch the water, women have a role to store the resource safely, treat and distribute it unlike the males whose role is much superior in use and access to the commodity (Jeil et al., 2020). For this reason, in 2022 about 31.3 % of women in SSA had no access to safe drinking water while more than 124 million women were using unimproved water sources, which is a threat to socioeconomic development in the region and the world at large (Luchsinger, 2023).

Issues of SSA women, their roles and the challenges they encounter when seeking for water are hardly publicized and understood. As such, affirmative action to enable participative water management is elusive in the region. Consequently, women in water management are depowered, deprived of learning and entrepreneurial opportunities in addition to encountering negative health effects, which result to economic downturns (Bishoge, 2021; Nyika and Dinka, 2023). Deconstructing such as water system through engagement and participation of women in water management is therefore essential to integrated water resources management (IWRM) and the realization of SDGs not only in SSA but also globally. According to the study, inclusivity of both men and women in water management through gender mainstreaming and repression of patriarchal cultures is synergistic to global efforts on sustainable water management (SWM) as is the focus in this research (Nyika and Dinka, 2023). The objective of this study is to explore the role of SSA women in SWM and the challenges they encounter in fulfilling their essential role in sourcing for the commodity. Additionally, the study suggests measures to promote SWM exclusive of gender bias.

2. Methodology

To gather information for this study, a methodology involving a simple literature review was applied. Using the keywords “women”, “water”, “water management”, “Sub-Saharan Africa”, “roles”, and “challenges”, related articles on women and water in SSA were searched in Scopus and Web of Science databases. The resultant articles were manually filtered and screened based on relevance before summarizing their inferences for use to write up the manuscript. Information from relevant reports of organizations such as the World Bank, United Nations and WHO were also summarized and used in the review.

3. Role of Ssa Women in Sustainable Water Management

Securing and managing water resources and access to the commodity is a financial undertaking dependent on good governance, which is characterized by multi-stakeholder participation and diversity (Nyika and Dinka, 2023). In SSA, girls and women have primary provision, collecting, use and managerial roles. As such, they travel to water points to fetch water in areas where piped and improved water sources are unavailable, treat it, store it and share it among family members for various domestic shores, which they predominantly perform compared to men (Jeil et al., 2020; Apatinga et al., 2022). Therefore, at the household level, women are the primary water administrators. They know the location of waterpoints, its quality and reliability and once they collect it, they are charged with storing and ensuring the cleanliness of the resource (Seri, 2023). In a study involving 61 nations, it was established that women and girls bore the burden of water collection in more than 80% of the households (United Nations Women, 2018). The United Nations Development Program also highlighted that in communities where women inclusion in water management is valued, effectiveness in aspects of expanded access, better water infrastructure functioning, environmental and economic benefits were realized (UNDP, 2006). In Kenya and South Africa, engaging women in water governance, policy- and decision-making processes on its management was reported to enhance solutions to water scarcity, and alleviate access and infrastructural challenges exacerbated by climate change hence, an improved economic value for water (Ifejika and Bikketi, 2018; Goldin et al., 2018). In another study, women involvement in water management brought the larger benefits of food security, environmental sustainability, poverty alleviation and social inclusion, which are supportive to sustainable development and the realization of SDGs (Organization for Economic Cooperation and Development, OECD, 2021). For this reason, SSA countries such as Togo, Tanzania, Zimbabwe and Uganda incorporated gender mainstreaming in their national SWM strategic plans (Nyika and Dinka, 2023).

Table 3: Role of women in driving SWM	
Role	**Description**
Labor and Productivity	Women are the primary source of labor for many water-based tasks including collecting water, locating water points, maintaining water infrastructure, and irrigation.
Household water management	Women are stewards at home settings involved in allocating and determining the quality and quantity of water for various domestic uses including cooking, drinking and sanitation.
Conflict resolution	Women are active participants in resolving issues arising from the use and sharing of water among other resources at domestic and community levels.

Table 4 (cont): Role of women in driving SWM	
Environmental stewardship	Women have vast knowledge about water resources, their evolution and potential over time.
Community and governance	Women participate in running water projects and community-based initiatives on SWM and are part of decision-making on water sharing and use.

Women in SSA are knowledgeable of available land and water resources and their interactions with one another. Such skills are useful at household level water management and enable conservation since they build awareness on the need to maximize the value of water (OECD, 2018; Omweri, 2018). It is with this logic that women in Central West Cote d'Ivoire are perceived as the guardians of water who ensure the resource's efficient use due to its finite nature Given the multiple, diverse and competing needs for the resource in human consumption, personal hygiene, household chores, agriculture and animal keeping, women are charged with water efficiency and effectiveness to avoid its misuse and pollution (FAO, 2017; Seri, 2023). Involving women in water management prompts a shift to efficient use and habits and disseminates knowledge on water awareness to enhance its security. These observations were made in Jordan after involving women and can be replicated to SSA countries for SWM (Benedict and Hussein, 2019). Although using labor-intensive and cheap infrastructure such as buckets and jerricans, women in Tanzania and Kenya as well as Ghana and Zambia (Von Koppen et al. 2013) were found to manage controlled produce and irrigated cultivation at distant fields and adopt well unlike their male counterparts who preferred to use mechanized infrastructure (Njuki et al., 2014). The tendency was affiliated with the weaker rights of women to water, land and resources hence limited opportunities to use water that they source for.

Apart from water collection, storage and agricultural management, women play a crucial role in governance of the resource. At household level, they serve as educators and mentors on efficient water use to their children, which is raising community awareness on SWM at basic level (Omweri, 2018). They also actively participate in operations and maintenance of communal water facilities such as water kiosks and boreholes to prevent water misuse and pollution. Women have also been known to lobby, organize and participate in protests and campaigns aimed at better and inclusive water management for their individual and community welfare. As such, they are becoming agents of change in SWM and decision makers in use of the resource. In SSA countries of Senegal, Ethiopia and Tanzania, women have lobbied to be equal partners in water management and co-designers in technologies of agricultural irrigation, which has improved the economic value of water and social welfare (Mwongera, 2022). In the Mano River bordering Liberia and Guinea, collaboration of women water managers in the two regions has alleviated preexistent conflicts in sharing the resource and reaping from its ecosystem services as noted by (Fauconnier et al., 2018). Such advances not only repress preexistent patriarchy in water sourcing characterized by long standing discriminatory practices and social restrictions to women but also strengthens their role in decision making on water use and sharing. Table 2 provides a summary of the role of women in SWM.

4. Challenges Ssa Women Face in Swm

In SSA water collection and its associated labor needs are gender- and child-based (Graham et al., 2016). This is because women and children bear the burden of water collection yet they have little control on the water they spend so much time and energy seeking for (WHO, 2017). In six rural communities of South Africa, adult women followed by female children were the main water carriers at 56 and 31 % and compared to male children and adults at 10 and 3 % in respective order (Geere et al., 2010). A similar trend was established in 15 SSA nations where more than 50% of primary water collectors were female in 13 countries except Nigeria and Cameroon where the portion of female water collectors was 46.6 and 45.8 %, respectively by (Sorenson et al., 2011). The number of women involved in water collection for more than the recommended 30 minutes per roundtrip in named SSA countries was as shown in Figure 1 (Graham et al., 2016).

The burden of water collection for women is location indiscriminate in developing countries and specific studies in SSA layout the particular challenges as shown in Table 3. A study established that in rural and urban areas more than 60 and 41 % adult women were responsible for collecting water unlike adult males responsible for water at 26 and 41 %, respectively by (Geere and Cortobius, 2017). Girls responsible for collecting water were also higher at 6.28 and 7.47 % in urban and rural areas compared to boys at 5.6 and 5.1 % in respective order (Geere and Cortobius, 2017). The burden for collecting water is even much higher than for girls and women dwelling in rural areas of SSA as shown in Figure 2 (World Bank Group, 2024).

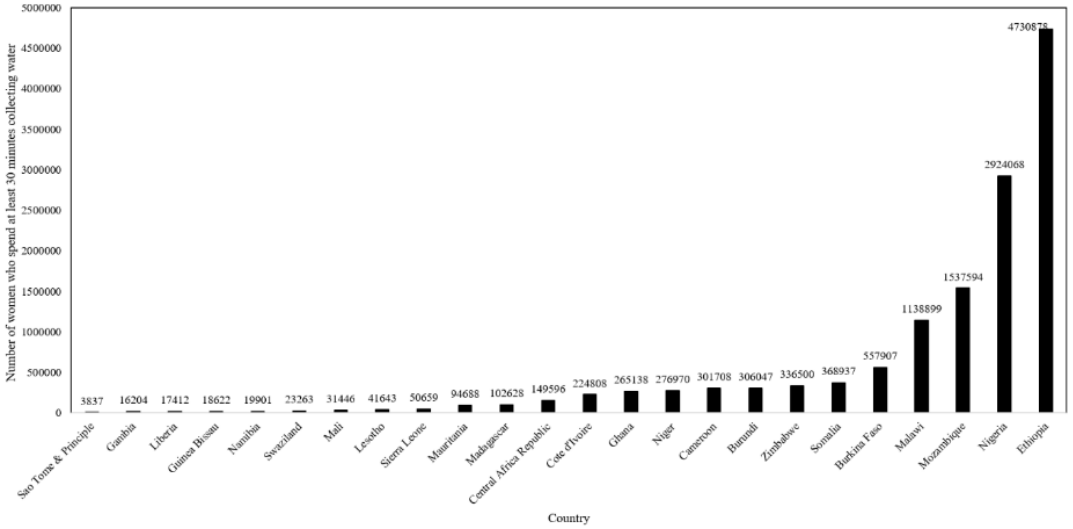

Figure 1: Number of women reported as primary water collectors in households of SSA and spent more than 30 minutes collecting water (Graham et al., 2016).

Fetching water is a demanding task, which presents various risks and is time and energy intensive. Women of SSA face various vulnerabilities, dangers and security threats during their journeys to collect water. In rural areas where water sources are located at distant locations, women are forced to trek in lone and unsecured paths where they become targets of physical attacks by assailants and wild animals on walking grounds as well as sexual violence victims owing to their defenseless nature. As noted that by travelling long distances to source for water, the women's routine becomes easily predictable due to the frequent trips they take and assailants easily take advantage of their isolation, lone and vulnerable nature to plan and calculate their attacks (Pommells et al., 2018). In Uganda and Ethiopia women were easy targets of gender-based violence while trekking to collect water in bushy, predictable and dark paths covered by trees and grass (Logie et al., 2021; Assefa et al., 2021). Similar tendencies have been reported in Blantyre, Malawi and in Bulawayo, Zimbabwe (Chipeta, 2009; Mukuhlani and Nyamupingidza, 2014). Women also risk physical attacks from animals that they share water with or encounter while walking. The apparent risks to physical attacks and sexual violence further affects the women psychologically, which leads to increased fear and anxiety as they seek for water (Geere and Cortobius, 2017).

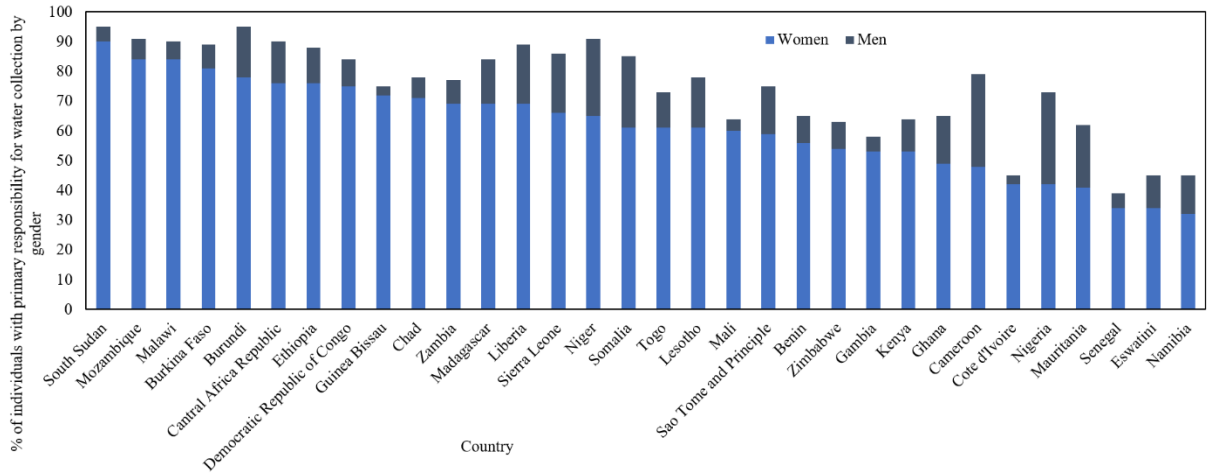

Figure 2: Percentage of individuals with the primary responsibility of collecting water in rural SSA countries based on gender (World Bank Group, 2024)

During water collection routines, women and girls were vulnerable to non-partner sexual violence, which resulted to rape and sexual assault. This was especially prevalent in water points that were controlled by men (Tallman et al., 2022). In Eastern Cape, South Africa, women and girls experienced 'bridal abduction' whereby, they were raped, kidnapped and forced into marriage while walking to and from water collection points (Meyiwa et al., 2014). Similar trends were observed in Uganda and Cameroon (Pommells et al., 2018; Thompson et al., 2011). Such incidences on women do not only affect their confidence but they also deprive their human dignity and lead to prolonged stigma and trauma.

Inability to collect water for women has been associated with domestic violence at household levels. Pommells and others noted this trend stating that, "…when women are unable to provide water or complete water-related tasks in the home, they are at risk of experiencing spousal abuse" (2018; p.1855). The trend has also been witnessed by women in events that water sources are financially difficult, insufficient and unreliable to access. In Kibra, an informal settlement in Kenya, inaccessibility of water at household level was correlated positively to IPV and domestic violence towards women (Ombija et al., 2024). The findings coincided with conclusions of another study involving 26 SSA countries by (Bachwenkizi et al., 2023). In SSA countries including Uganda, Burkina Faso, Mozambique, Zambia and Malawi, women endured spousal verbal attacks and disputes, physical, sexual and emotional abuse due to their inadequacies and inefficiencies as primary water collectors (Barchi and Winter, 2020; Winter et al., 2021; Chipeta, 2009). A study also reported the replication of the trend in 19 other SSA nations in the period between 2011 and 2018 by (Epstein et al., 2020).

Table 5: Specific SSA studies reporting on the disparities of water access by women compared to men

Reference	Specific Findings
Angoua et al., 2018	SSA women spend many hours sourcing for water points to fetch water.
Bachwenkizi et al., 2023	Women travelled long distances in search of water.
Bukachi et al., 2021; Nyika and Dinka, 2025	Many women in informal settlements relied on water vendors (water kiosks) also located distances from their residence.
Dickin et al., 2020	In male-controlled water points, conflicts arose as women were struggling to access the resource leaving them vulnerable to violence.
Farber et al., 2022	Girls were either absent from school or arrived late because they had to fetch water.
Kurebwa, 2017	At water points, rules such as queuing were violated due to the long time spent accessing the resource and hence, disagreements arose.
Mushavi et al., 2020	Some of the water fetched was unsafe for consumptive uses.
Van Koppen, 2023	Women took rotational turns to get the water and the containers to put the resource were limited as the resource was not enough for all.
Meyiwa et al., 2014	Women were attacked physically and sexually as they collected water.
Nyika and Dinka, 2023	Some water points dried up forcing women to look for alternative sources.
Dickin et al., 2020; Van Koppen, 2023	Women held limited leadership position in water projects and regulatory structures. Ownership of water points was male-dominated.
Derman and Prabhakaran, 2016; Abu et al., 2019	Women were deliberately excluded from state-owned water governance structures and had no knowledge of meetings and activities by water users associations.

The burden of gathering water for SSA women also comes with time and energy costs as noted (Fleifel et al., 2019). The lost time depends on geographical location, terrain and inaccessibility extent of a particular water point. Although the recommended time to be spent collecting water in a round trip by WHO is 30 minutes, in SSA, such trips are reported to take longer (Howard and Bartram, 2003; World Bank Group, 2024). In rural areas of Somalia, women spend a mean of 11.3 hours a week to collect water (Geere and Cortobius, 2017). Considering that the reported figure is an average, the time spent could even be longer in some regions. In Burundi, Malawi and Somalia, 29.1, 25.3 and 20.6 % of primary water collectors (mostly women) spent more than an hour for a round trip of water collection (Sorenson et al., 2011). Another study noted that SSA women spend about 40 billion hours annually looking for and collecting water, which is equivalent to the yearly labor for all of the French

workforce by (UN Women, 2014). As noted that many SSA women and girls of rural SSA spent up to two-and-a-half hours for a round trip of water collection since 90% of their homesteads have no access to improved water sources (Mwongera, 2022). In another study, time spent to collect water was estimated at 10-65 minutes in urban and 12-78 minutes in rural areas, which totaled to an average of 11.3 hours a week in developing nations including those of SSA (Geere and Cortobius, 2017). In Ghana and Zimbabwe, female-headed households dedicated more time to sourcing water, which exacerbated their apparent poverty (Amankwaa et al., 2024; Gambe, 2019).

With time lost collecting water, other opportunity costs and tradeoffs emerge for women in SSA. These include exacerbated poverty due to divided attention to do other activities such as attending school and other educational opportunities, entrepreneurial ventures and taking care of individual and family health (Kes and Swaminathan, 2006; Sorenson et al., 2011; Geere and Cortobius, 2017). Apart from educational and income generating activities, time spent collecting water by SSA women would be used for leisure activities, childcare, community and political events, which could empower them and improve their quality of life (Gomez et al., 2019). The burden of water in South Africa left women spending 25% less time in paid employment compared to men (Geere and Cortobius, 2017). In another study, projected that the 40 billion hours that women spent collecting water in SSA would be translated to $15,330 million of economic benefits annually if the millennium development goal (MDG) target on water, which is equivalent to the current SDG 6 on water access and sanitation was met (Hutton et al., 2007; UN Women, 2014). In addition to time lost, a lot of energy is expelled by women to commute both short and long distances to carry water (mostly using jerricans and buckets on their heads and backs) and this leaves other productive activities unattended optimally. For this reason, SSA women are not financially independent and have less dedication to community participation and decision-making activities due to the water burden (Munoz, 2013; Doss and Meinzen-Dick, 2015; Seri, 2023).

With the primary responsibility to collect water, women are vulnerable to several health complications emanating from walking long distances to look for water, standing in long queues waiting to fetch water, enduring in lone paths with harsh terrain and the fear of harm by assailants, wild animals and from violent spouses. Therefore, the health complications can manifest as either physical or psychological. Physical injuries can be severe if multiple and distant trips are taken to fetch water and if the women or girls start collecting water at an early age when physical development is ongoing (Fleifel et al., 2019). Pommells et al. noted that women suffered from, "long term back injuries, micronutrient deficiencies due to high caloric expenditure, and a lack of choice, which continue to stunt the health and development of women and girls in communities where water fetching is commonly practiced" (2018, p.1852). In Cote d'Ivoire, women experienced hip pains, foot pains, back pains and whole-body aches associated with fatigue from fetching water (Seri, 2023). In difficult terrains characterized by steep slopes, injuries associated with falls and slips were also reported (Seri, 2023). In rural SSA nations of Kenya, Tanzania, Ethiopia, Uganda, Democratic Republic of Congo, Nigeria and Ghana, injuries in the form of fractures, dislocations and musculoskeletal disorders including chest, upper back and limb pains were also reported among women and girls involved in fetching water (Venkataramanan et al., 2020; Nyika and Dinka 2023; Geere et al., 2018).

The mental wellbeing of women in water scarce SSA regions is also affected because of continuous anxiety and fear while travelling to water points, the imbalance between the coping capacity, individual and household water-related responsibilities and challenges, which results to psychosocial and psychological health complications (Bisung and Elliott, 2017). The challenges are exhibited as frustrations, exhaustion, fatigue and inferiority complex (Bisung and Elliott, 2016). The quest for water was closely associated with the risk to depression and anxiety disorders in Mbarara, rural Uganda whereby the vulnerability of women collecting water to such psychological complications was higher than that of men (Copper-Vince et al., 2017; 2018). A similar trend was reported among Ethiopian and Kenyan women and attributed to their apparent water burden (Stevenson et al., 2012; Bisung and Elliott, 2016). Mushavi shared similar sentiments in a rural Ugandan study claiming that, "When you have no water, it means you have no peace" and hence psychosocial distress for the entire population including women (2020, p.1). In informal settlements of Malawi, the water burden was associated with stigma, anger, shame and stress in addition to anxiety among women resulting to mental health complications (Adams et al., 2022; Wutich et al., 2020). Such tendencies are triggers and drivers to domestic and spousal abuse associated with water insecurities in the region (Bachwenkizi et al., 2023; Ombija et al., 2024).

The health effects can further be exacerbated by insecurities and risks that women face during the quest for water. The risk to sexual assault and violence can lead to additional physical injuries, sexually transmitted diseases (STDs) and chronic conditions such as HIV AIDS (Fleifel et al., 2019). Animal attacks could cause wounds and infections that are sometimes fatal. Overall, these challenges impact the ability of women to perform their day-to-day activities.

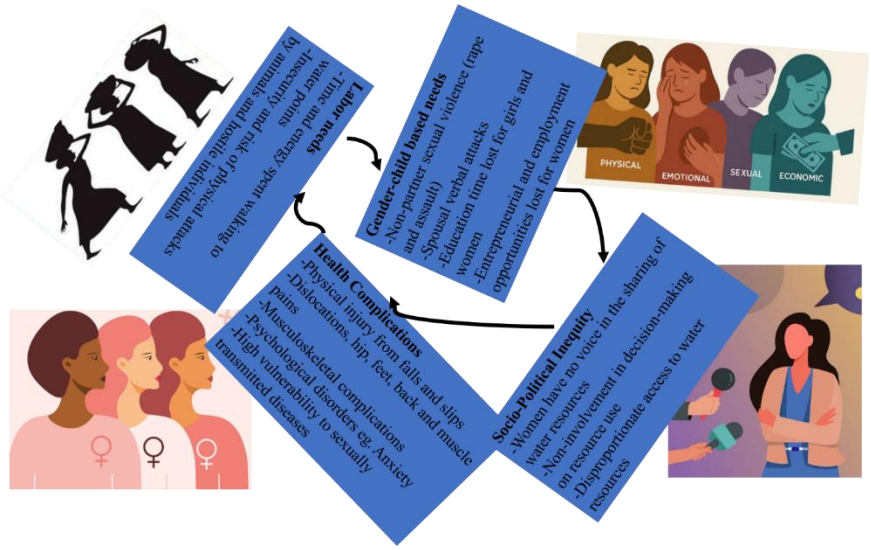

Figure 3: Categories of challenges that SSA women and girls face in as they seek for access to water resources

Women with special vulnerabilities such as orphans, people suffering from chronic conditions or diseases, orphans, women facing social stigma, pregnant women and the disabled even face a greater challenge to access water (Geere and Cortobius, 2017; Wrisdale et al., 2017; Pommells et al., 2018). The women have various circumstantial and physical limitations that make the water collection journey difficult to complete. Considering that women of SSA are the primary water collectors, such vulnerabilities heighten water insecurity and the ability to access it equitably. Consequently, vulnerable women are forced to take the life-threatening trips to collect water or forfeit basic needs such as sanitation and personal/ household hygiene that require water use or even make costly alternative arrangements to access the commodity (Fleifel et al., 2019).

Pregnant SSA women for instance do not have access to enough water and end up compromising their much-needed nutritional and health needs to buy the commodity. In Kenya, Ghana, Zimbabwe, and Uganda pregnant women were at risk of injury, bodily strain and high calorific expenditure while collecting water (Collins et al., 2019; Nutor et al., 2024; Mukuhlani and Nyamupingidza, 2014; Mushavi et al., 2020). In Kitui, rural eastern Kenya, women were found to borrow, loan and share water with one another due to vulnerabilities such as pregnancy, childbirth and sickness, which reduced their ability to collect water (Bukachi et al., 2021).

Vulnerabilities associated with political and social inequities are additional challenges to the access to water for SSA women. For this reason, women become marginalized and have disproportionate access to

the commodity and become culprits of the health and economic impacts of water inaccessibility (UNICEF and WHO, 2015; Nyika and Dinka, 2023). For instance, South African women walked long distances to water points but could not access water in male-dominated wells due to the social standings and gendered power relations (Tallman et al., 2022). Similarly, the dignity of SSA women and their ability to access good quality and quantity of water was diminished due to their social standings compared to men (Fleifel et al., 2019).

Travelling long distances to collect water from mostly unimproved water points is associated with lack of reliable and safe water. For SSA women, such challenges have implications on their reproductive health particularly during pregnancy, mensuration and childbirth as well as their overall health (Well Aware, 2024). During the onset of the menstrual cycle, safe sanitation is essential for women and girls and once it is not provided, the latter can fail to attend and concentrate in school or not engage in entrepreneurial activities. Additionally, the girls risk dropping out of school and worsens the cycle of violence, inequity and poverty (Well Aware, 2024). As observed that women of Ghana, Kenya and Uganda face water, sanitation and hygiene challenges due to their physical and special vulnerabilities citing the need for policy revision and enforcement towards gender equity (Dogoli et al., 2023). Figure 3 provides a summary of the challenges that women of SSA region face in their quest for water.

5. Future Prospects

As established in this review, women in SSA region are depowered in water management and governance despite their crucial role in the resource's collection, treatment, safe storage and distribution to other family and household members (Geere and Cortobius, 2017; Geere et al., 2018; Winter et al., 2021). The trend is propagated by cultural norms where women are subordinates to males and the latter commands some superiority in the rights, access and use of water (Nyika and Dinka, 2023). Consequently, women and girls "...lose school and entrepreneurial opportunities, have negative health effects emanating from enduring long distances and unfriendly terrain in search of water and overall, negative economic ramifications occur due to these effects" (Nyika and Dinka, 2023, p.70).

Moving forward, patriarchal cultural norms in SSA region must be deconstructed for SWM approaches that are gender sensitive and incorporate the capabilities, skills and knowledge of both males and females. As made similar recommendations claiming that such advances enhance resilience to water insecurities especially in the wake of climate change and its associated effects (Kanyerere et al., 2018; Bishoge, 2021). As emphasized on the need revise the customary water tenure in SSA by deconstructing and depowering male-dominated investments in the region, which can be realized by integrating productive and domestic water needs and at the same time, engaging and empowering women as decision-makers on the management of the resource (Van Koppen, 2023). Also recommended for the modification of social-cultural beliefs and cultures that support and inculcate women in water governance since it is promotes water security (Ifejika and Bikketi, 2018). Through engaging women in water management in Laikipia, Kenya, and in Limpopo, South Africa better outcomes in dealing with water scarcity and climate change effects and at the same time, realization of transformative economic benefits was reported (Ifejika and Bikketi, 2018; Goldin et al., 2017). Women as water guardians enhanced community awareness on behavior and attitude adjustments during the use, sharing and management of water. The GWA and UNDP (2006) also reported positive gains in water access, its wise use and strategic allocation for better sanitation and hygiene in South Africa, Senegal, Togo, Tanzania, Zimbabwe, Kenya and Uganda following gender mainstreaming in the water sector. Such advances must be rooted in strong policy enactment on gender equity, individual community change on women being weaker community members, sociopolitical willingness to engage women in community projects and cultural transformations to enable the use and valorization of women's water management skills. Researchers must also be at the forefront to publicize the challenges that women face in water management and also advocate for affirmative action to reverse the situation at all levels of governance.

To reduce the insecurities and vulnerabilities associated with reaching to water points to collect water among SSA women, there is a need to improve local water infrastructure. This is possible by equipping households with reliable groundwater pumping systems, rainwater harvesting systems and piping systems. Noting the need to expand local water infrastructure in SSA, emphasized the need for financial aid from foreign, local, governmental and non-governmental partners to improve water access and the technology and human resources that enable its safe treatment and supply (Ndikumana and Pickbourn, 2017). In rural Uganda, installation of improved water sources including public taps, protected springs, rainwater storage and boreholes reduced the associated burden for water collection to both women and men (Baguma et al., 2013). Additionally, scientific research will be handy in promoting advanced technology to handle, supply and access safe water in the region efficiently.

In line with realizing of SDGs 5, 6, and 10, women's control over water, its access and use at household level needs to be improved through water governance. Such an input would translate to a cultural disorientation of the African household custom where women can share the burden of water administration responsibilities with men rather than being overburdened with such responsibilities (Pommells et al., 2018). According to the study, more water control and access to SSA women can be enhanced through shared responsibility to induce their active participation in water management and breakdown existent gender barriers in collection of the resource (Baguma et al., 2013).

Political representation by women for water rights is a viable solution to their water insecurities. As made this recommendation noting that women are better water planners and managers given their knowledge of water needs at household, family and community levels in comparison to men (Sorenson et al., 2011; Pommells et al., 2018). Therefore, involving them in water governance, water policy creation and enforcement as well as management would enable and improve reliable, well regulated, equitable and sustainable access to the resource. In Marsabit, Kenya, involving women in water management committees allowed them to exercise their leadership skills, increased community awareness on the difficulties they faced in water collection and the need to use the resource efficiently (Yerian et al., 2014). Furthermore, the initiative deconstructed the social stigma and social risks associated with women in water management in a patriarchal society using culturally accepted approaches. As such, women involvement and participation in general political leadership, water governance and management is recommended due to its stimulatory tendencies to policy reforms and formation of inclusive local initiatives that lead to SWM and sustainable development at large.

6. Conclusion

The objective of this study was to understand the role of SSA women in SWM, the challenges they encounter in the quest for water and to suggest measures to improve the apparent situation in the region. Using a simple literature review approach, women were found to be guardians and primary administrators of water since they searched for water points, carried, treated and shared it with the rest of their households. Being in a patriarchal society, they faced disproportionate rights to water compared to men. From the dangers, risks and burden in water management, urban and rural SSA women were disadvantaged in meeting individual and household basic water needs. Additionally, they missed out on educational, socio-economic and entrepreneurial opportunities, were physically and sexually abused by assailants and spouses, and faced health risks associated with the quest for water as established in this study using named case studies. The challenges were established as hindrances to meetings targets of SDGs 5, 6 and 10. To alleviate the challenges, the study emphasized the need for local initiatives on water infrastructure improvement, deconstruction of gendered water by empowerment of women in the control of resources and investments including water-related ones. Furthermore, the involvement of women in water committees and decision-making on the control, access and use of the resources was recommended. Moving forward, the enactment of stronger policies and the creation of common water responsibility sharing norms can strengthen the course of reducing the water burden on SSA women and enhance SWM and gender equality.

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