

Strengthening gender equality and
inclusivity in the national system of
Science, Technology and Innovation:



UGANDA

COUNTRY PROFILE



Gender & Inclusivity
A PROJECT OF THE SCIENCE GRANTING COUNCILS INITIATIVE



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Strengthening Gender Equality and Inclusivity in Science, Technology and Innovation (STI) highlights the contextual factors driving gender and inclusivity disparities in STI in Uganda as well as options and strategies for addressing disparity gaps in some of UNESCO's STEM and Gender Advancement (SAGA) policy impact areas.

These impact areas are social norms and stereotypes, education (primary, secondary and tertiary), the career progression environment, research content and practice, policy and entrepreneurship and innovation.

This profile synthesizes important data for funding agencies, researchers, policymakers and other actors advancing gender equality and inclusivity in STI at country, regional and international levels.

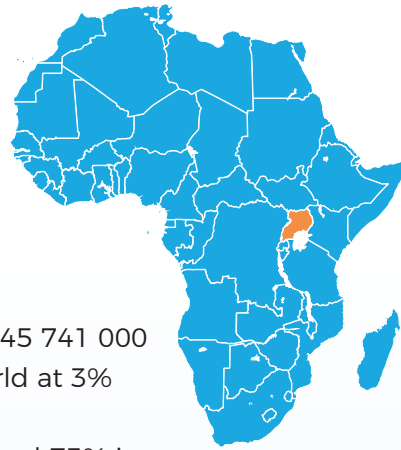
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Country overview



Uganda is in East Central Africa and borders South Sudan, Kenya, Tanzania, Rwanda and the Democratic Republic of the Congo.

Women and girls make up 50,7% of the total population of 45 741 000 people. Uganda has one of the highest growth rates in the world at 3% (World Bank, 2022).

More than 25% of the total population lives in urban areas and 75% in rural areas. Uganda's urban growth rate is amongst the highest in the world at 5,2% (O'Neill, 2023).

Drought in recent years in Uganda has negatively impacted the country's economic progress, especially in the agriculture sector, which contributes to 25% of the economy, 50% of exports and 70% of employment (UNCTAD, 2020).

Uganda has stagnated in achieving many of its Sustainable Development Goals (SDGs) and regressed in some (Sachs et al., 2022; UN Women, 2020):

- Major challenges remain for ending poverty (SDG 1).
- Progress in ending hunger (SDG 2) and good health and well-being (SDG 3).
- Access to clean water and sanitation has stagnated (SDG 6).
- Gender equality (SDG 5) shows no progress.
- Only 42,6% of indicators are available for monitoring Uganda's SDGs from a gender perspective, with critical data gaps in unpaid care and domestic work, key labour market indicators and information and communications technology skills. Closing these gender data gaps is essential for achieving the country's gender-related SDG commitments.

Gender and inclusivity disparities negatively impact Uganda's human potential for socio-economic development

- Gender disparities in Uganda are perpetuated mainly in formal and informal institutions, such as: marriage, family, patriarchy, religion, asset ownership, employment opportunities, gender-based violence (GBV) and social and cultural practices (Uganda Bureau of Statistics and Ministry of Gender Labour and Social Development, 2019). Women and girls continue to face challenges accessing their human rights due to laws, policies, sociocultural practices and customs that discriminate against them in obtaining political leadership and economic achievements (World Economic Forum, 2022).
- Persons living with disabilities continue to experience stigma and discrimination, including socio-economic exclusion. Girls and women living with disabilities experience a double burden of disability and gender-related inequalities (Mac-Seing et al., 2020).
- The majority of people in Uganda express tolerant attitudes toward people of different religions (95%) and ethnicities (90%) although compared to other countries in the region, tolerance towards immigrants and foreign workers is far lower at (76%). Uganda has one of the lowest tolerance levels toward people of different sexual identities or orientations at 3% (Howard, 2020).
- The country has made substantial progress in reducing gender disparities and discriminatory practices in the critical social institutions of the family, civil liberties, reproductive autonomy and access to productive and financial resources between 2019 and 2023 (Table 1, SIG Index).
- However, there remains work to achieve full gender equality; disparities harm female livelihoods and the potential for poverty alleviation and growth on a national level (UNDP, 2021).
- Structural drivers of gender inequality result in Uganda reporting gender disparities on several socio-economic development indices (Table 1). These indicators do not include data on intersecting marginalised identities and experiences of women and girls, e.g., rurality or disability, which hampers a nuanced picture of gender- and other inequalities in the country.

TABLE 1: Key gender indicators for Uganda

Human Development Index (HDI) (UNDP, 2021)	
<p>This index measures average achievement in human development in three dimensions: a long and healthy life (health), knowledge (education), and a decent standard of living (command over economic resources). The closer the value to 1, the higher the country's level of human development.</p>	<p>Uganda had an HDI value of 0,544 in 2019 to 0.525 in 2021, standing at 166th out of 191 countries and territories.</p>
Gender Inequality Index (GII) (UNDP, 2021)	
<p>This index exposes the human development costs of gender disparities in three areas of human development: reproductive health (maternal mortality ratio and adolescent birth rate), empowerment (population with at least some secondary education; share of seats in parliament) and the labour market (labour force participation rate). The closer the score to 1, the more disparities between men and women and the greater the loss to human development.</p>	<p>Uganda has a GII value of 0,530, ranking it 131 out of 191 countries in the 2021 index. When the sub-indices disaggregate this value, a more nuanced picture of imbalances emerges.</p> <ul style="list-style-type: none"> ● Women hold 33,8% of parliamentary seats, higher than the sub-Saharan African average of 25,7%. ● 29,3% of adult women have reached at least a secondary level of education, compared to 36,3% of their male counterparts; the figures are below the SSA averages of 31,1% for women and 44,3% for men. ● For every 100 000 live births, 375 women die from pregnancy-related causes, which is below the (SSA) average of 536. ● The adolescent birth rate is 107,9 births per 1 000 women of ages 15-19, higher than the SSA average of 101. ● Female (15 years and older) participation in the labour market is 54,5%, compared with 62,2% for men. The figures are lower than the SSA of 62,1% for women and 72,3% for men.
Social Institutions & Gender Index (SIGI) (Organisation for Economic Co-operation and Development, 2023)	
<p>This index assesses the extent of discriminatory social institutions- the complex web of formal and informal laws, social norms, and practices that limit women and girls' access to their rights, justice, opportunities for empowerment, and resources and undermines their agency and authority. A SIGI value of 0% indicates no discrimination and 100% very high discrimination in social institutions.</p>	<p>At 27,4% in 2023, Uganda's social institutions showed a significant decrease in discrimination against women compared with 45,1% in 2019. Discrimination is highest in family discrimination and lowest in restricted civil liberties.</p> <ul style="list-style-type: none"> ● Family discrimination (40,8%) captures power distribution within households. It evaluates how much girls and women may be undervalued (e.g., child marriage rate, the gender gap in unpaid care and domestic work, and laws on divorce and inheritance). ● Restricted physical integrity (32,5%) captures social institutions that make women and girls vulnerable in these areas and limit their control over their bodies and reproductive autonomy (e.g., laws on violence against women, female genital mutilation, and reproductive freedom, the prevalence of intimate partner violence and percentage unmet needs for family planning). ● Restricted access to productive and financial resources (28%) captures women's restricted access to and control over crucial economic assets and resources, e.g., land ownership, bank account ownership, and the gender gap in management positions. ● Restricted civil liberties (5,1%) capture social institutions that limit women's access to participation and voice in the public and social spheres.
The Global Gender Gap Index (GGGI) (World Economic Forum, 2022)	
<p>This index measures gender-based gaps in access to resources and opportunities across four categories: economic participation and opportunity, educational attainment, health and survival, and political empowerment. The closer the score to 1, the higher the gender parity.</p>	<p>With a GGG value in 2022 of 0,724, Uganda has closed 72% of its gender gap, ranking 61 out of 146 countries globally and 11th out of 36 sub-Saharan African countries. When the sub-indices disaggregate this value, a more nuanced picture of imbalances emerges, with greater parity on health and survival and lower political empowerment.</p> <ul style="list-style-type: none"> ● Health and survival (98%) evaluate parity in sex ratio at birth and years of health life expectancy. ● Educational attainment (92%) evaluates parity on literacy rate and percentage enrolments in primary, secondary and tertiary education. ● Economic participation and opportunity (69%) evaluate parity on measures such as the labour force participation rate, wage equality for similar work, percentage of women legislators, senior/executive management, and professional and technical workers. ● Political empowerment (29%) evaluates parity in the percentage of women in parliament, ministerial positions and years with a female head of state.

STI and sustainable socio-economic development

- Uganda's STI systems for human development are part of the long-term national development plans and strategies, legal frameworks and policy instruments stemming from the country's first long-term development plan formulated in the 1990s. The Ugandan government recognizes the importance of STI for socio-economic growth and social transformation.
- The **Ugandan National Council for Science and Technology (UNCST)** was established by an act of parliament in 1990 to advise, develop and implement policies and strategies for integrating science, technology and research development in Uganda. UNCST is a semi-autonomous government agency within the Ministry of Science, Technology and Innovation (MOSTI) (UNCTAD, 2020). UNCST initiated the STI policy formulation in 1994. UNCST also conducted the 2002 and 2006 policy reviews to integrate STI into the national development process.
- The organisation of the STI landscape in Uganda is principally guided by the **National Policy on Research, Science, Technology and Innovation (RSTI) of 2009**, which is a response to Uganda's vision goals for 2040, a 30-year vision developed in 2007 (Ministry of Finance, Planning and Economic Development, 2009).
- The **Vision for 2040** and focal areas for social and economic development and transformation are set out in Box 1. Significantly, the focal area of social transformation emphasises strengthening gender equality to ensure sustainable and equitable development (Republic of Uganda, 2007).
- To support the achievement of the objectives of Uganda's STI policy, the government published a **National Science and Technology Plan (NSTP)** for 2012/2013 – 2017/2018. The Plan outlines goals, strategies, strategic actions and expected results concerning achieving the vision for the science and technology development and societal transformation outlined in the Vision 2040 (Ministry of Finance, Planning and Economic Development, 2012).
- In 2019, MOSTI designed the **National Research and Innovation Program (NRIP)** to promote research and development, technology incubation and technology commercialisation activities. The NRIP presents a research and innovation funding system that delivers innovation solutions while ensuring value for money. The programme outlines funding application eligibility criteria for institutional and individual applicants and proposal assessment criteria, but there is no evidence for mainstreaming gender and equity in the document.

- Adjusted by population, the number of researchers in Uganda is 75% lower than the African average, and the gross expenditure in research and development (GERD) is among the lowest on the continent (at 0,14% of the GDP in 2022) (Fosci et al., 2019; STATISTA, 2022).
- Uganda's scientific **peer-reviewed publications and patents** used as a measure of research and development (R&D), indicate the following:
 - Scientific knowledge production has grown since 1996.
 - Researchers increased their publication outputs from 145 publications in 1996 to 3154 documents in 2023, with a total of 28645, ranking 10th out of 59 African countries (Scimago, 2023).
 - The country's percentage contribution to Africa's publications has grown from 1,04% in 1996 to 1,93% in 2022.
 - Publications in Medicine dominate, followed by the Social Sciences, Agricultural and Biological Sciences, Veterinary Sciences, and Environmental Sciences (Scimago, 2023).
 - The proportion of papers written with international partners has increased from 54,48% in 1996 to 80,66% in 2022 (Scimago, 2023).
 - Between 2008 and 2017, Uganda increased the number of gender-related publications by 7%, from 291 in 2008 to 540 in 2017, just above the average of 6% for the 15 participating SGCI countries (Figure 1) (Jackson et al., 2022).
 - Residents and abroad applicants filed 125 patents between 2012 and 2021, ranking low at 30th out of 37 Africa rankings in 2021 (The World Intellectual Property Organisation, 2021).

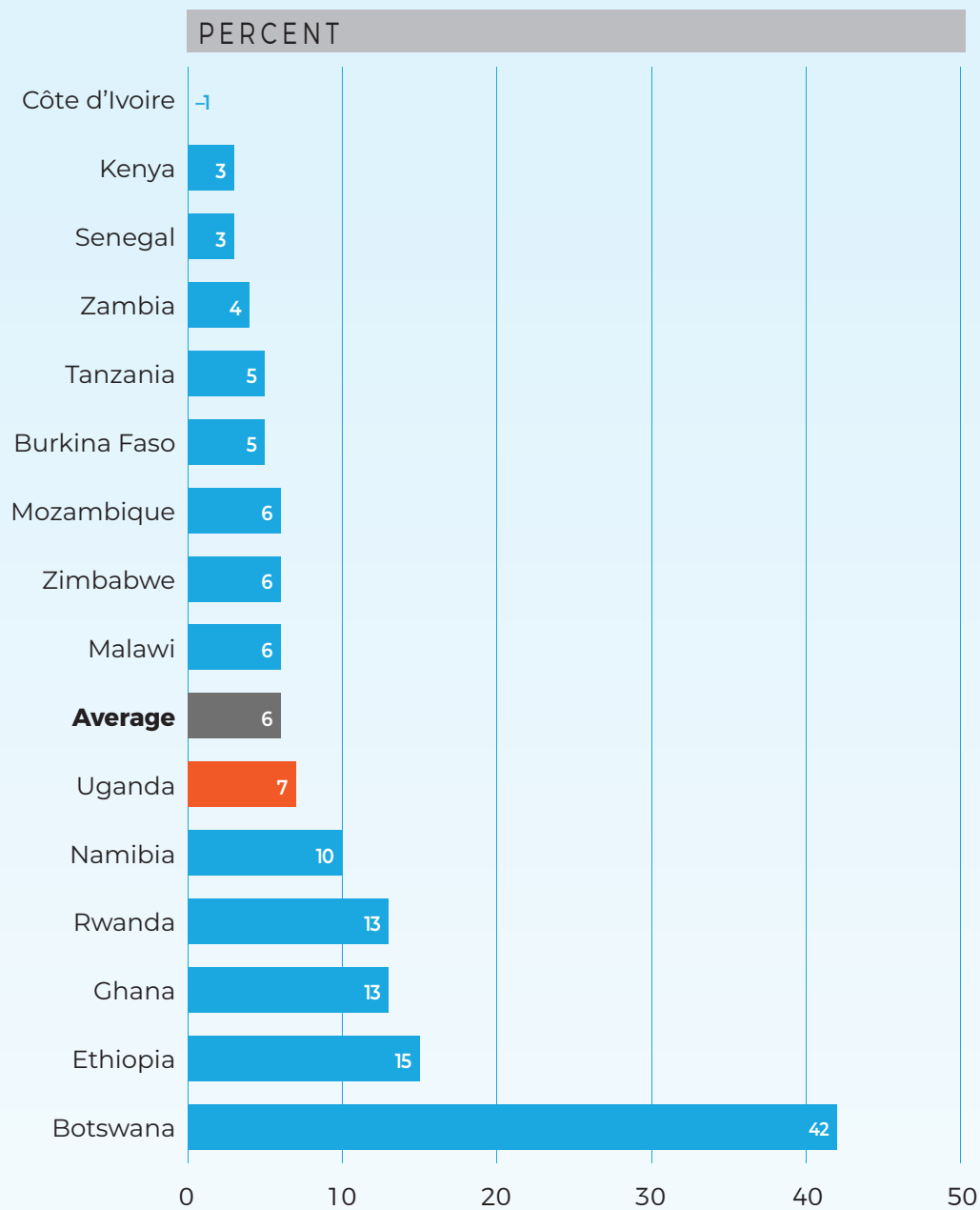


FIGURE 1: African SGCIs participating countries percentage (%) increase in publications with gender-related content between 2008 and 2017

Status of human capital for STI

- Gender disaggregated data gaps paint an incomplete picture of the status of human capital for STI in Uganda. A lack of regular data reporting on R&D personnel is a global challenge: “In 2018, 50 countries recorded the number of researchers (in head counts), down from 97 countries in 2015” (UNESCO, 2021, p. 47).
- Bearing this global data challenge in mind, in 2014 women constituted 30% of researchers in the country (Unesco Institute for Statistics, 2021).
- In 2014 (latest available data), women constituted almost one third (32.6%) of Uganda’s total R&D personnel of 2811 (by headcount).
- Unfortunately, there is no year-on-year data for comparison purposes. The total number of women in R&D is significantly lower than men for each category of R&D function (Table 2). Women are better represented in the supporting staff category (40%), decreasing in representation in the technician category (34%) and the researcher category (30%) (UIS, 2021).

TABLE 2: Total number of R&D personnel (headcount) by category and gender for 2014

	Women	Men	Total	% Women
Researchers	578	1365	1942	30
Technicians	205	394	599	34
Support staff	135	205	340	40
Total	918	1964	2811	

- Uganda’s distribution of researchers by field of research in 2014 (Figure 2) illustrates gender disparities across all fields of scientific research, with men prominent across the “hard sciences” of Engineering and Technology (79%), natural sciences (75%), and Agricultural and Veterinary Sciences (73%), and women more prominent (but still not as prominent as men) in Medical and Health Sciences (31%), and in the “soft sciences” of Social Sciences (36%) and the Humanities and Arts (30%) (UIS, 2021).
- Overall, a decisive move away from the stereotypic notion and practice of the hard sciences as mainly a male domain is not yet apparent.

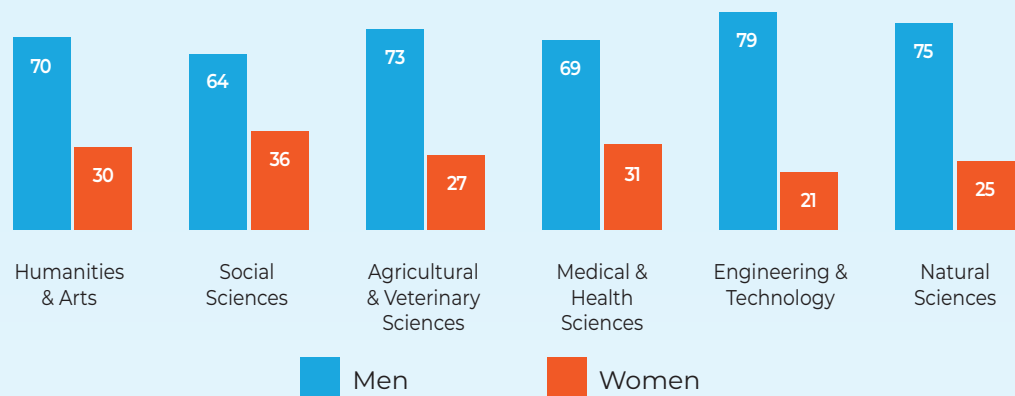


FIGURE 2: Distribution (%) of researchers (headcount) by scientific field and gender, 2014

Distribution by field of employment (Figure 3) shows that in 2014, women were underrepresented in all settings, but were more concentrated in the private non-profit sector (38%), followed by government (35%), higher education (29%) and, lastly, business enterprise (24%) (UIS, 2021).

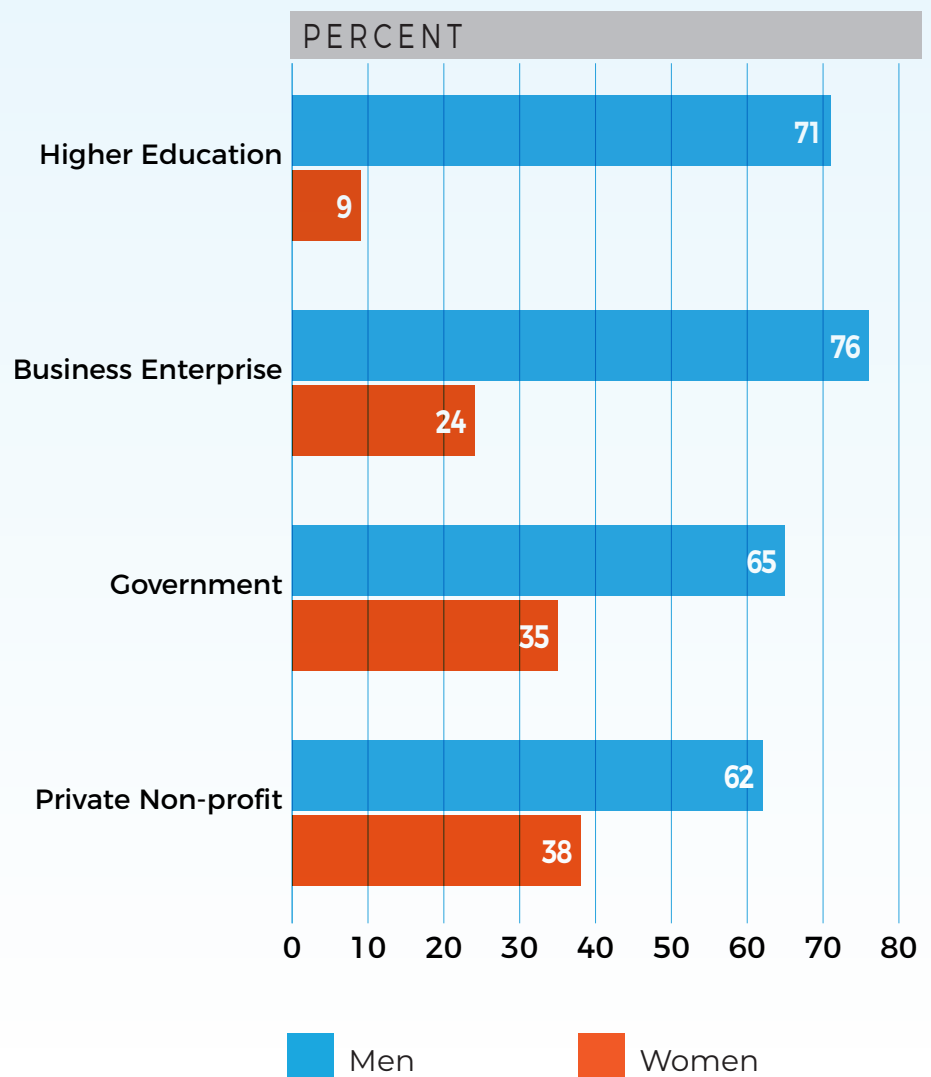


FIGURE 3: Proportion (%) of women in R&D by employment sector for 2014

What factors encourage (discourage) women's participation in the national system of science, technology and innovation?

Policy and frameworks

- The **Ugandan Constitution** prohibits gender discrimination and enshrines the protection of the rights of women and other groups marginalised based on race, colour, ethnic origin, tribe, birth, creed or religion, social or economic standing, political opinion or disability (Republic of Uganda, 2017).
- **Vision 2040** addresses the issue of gender equality as part of social transformation and cites the need for behavioural change to achieve development goals, which include a commitment to promoting gender equality so that men, women, boys and girls have equal opportunities and access to resources (Republic of Uganda, 2007).
- The 3rd **National Development Plan (2020/21 – 2023/25)** integrates the SDGs and identifies gender equality as a cross-cutting issue (National Planning Authority, 2020).
- The **National Gender Policy of 1997**, revised in 2007, is the primary legal framework for gender equality and women's empowerment in all sectors (Hailu et al., 2023).
- The **Ministry of Gender, Labour and Social Development (MGLSD)**, established in 1995, addresses issues of inequality and exclusion and is in charge of policy formation and progress monitoring.
- The 3rd **National Action Plan on Women, Peace and Security (2021-2025)** has as one of its four results areas the promotion of meaningful participation of women in leadership and governance at all levels (Ministry of Gender, Labour and Social Development, 2021).
- **National Science and Technology Plan (NSTP) 2012/2013 – 2017/2018**, notably, strategy five which is related to gender and equity. The strategy highlights the potential of a gender-sensitive approach to defining interventions for men and women, and calls for gender analysis and planning to enable men and women to participate equally in and benefit equally from STI development efforts. The results framework lists policy actions for and expected results of strengthening gender and equity (Ministry of Finance, Planning and Economic Development, 2012).
- The **Science, Technology and Innovation Sector Development Plan 2019/2020-2024/2025** includes gender mainstreaming as a cross-cutting issue with two main intervention areas: 'science for women and persons with disabilities' and 'women in science' (UNCTAD, 2020).

- The 2nd **Gender in Education Policy (2016-2030)** is aimed at achieving inclusive and equitable quality education through interventions that target “wide gender gaps in retention, transition, performance, and completion at all levels that continue to disadvantage women” (Hailu et al., 2023, p. 19).
- The country does have a **School Re-Entry Policy** – 2020 Revised Guidelines for the Prevention and Management of Teenage Pregnancy in School Settings in Uganda – that supports girls’ rights to continued education. However, the onerous conditions, such as mandatory maternity leave at three months pregnant and re-entry six months after birth means girls are effectively out of school for one year, contributing to gender-related barriers to girls’ educational attainment (Human Rights Watch, 2022).
- Overall, policy implementation gaps in Uganda mean that “the numerous gender-responsive legal, policy and institutional frameworks established are not consistently enforced, largely due to Ministries, Departments and Agencies lacking adequate funding and human resources to implement gender policies, limited knowledge in gender and equity programming and insufficient gender-disaggregated data” (UNDP, 2022, p. 5).

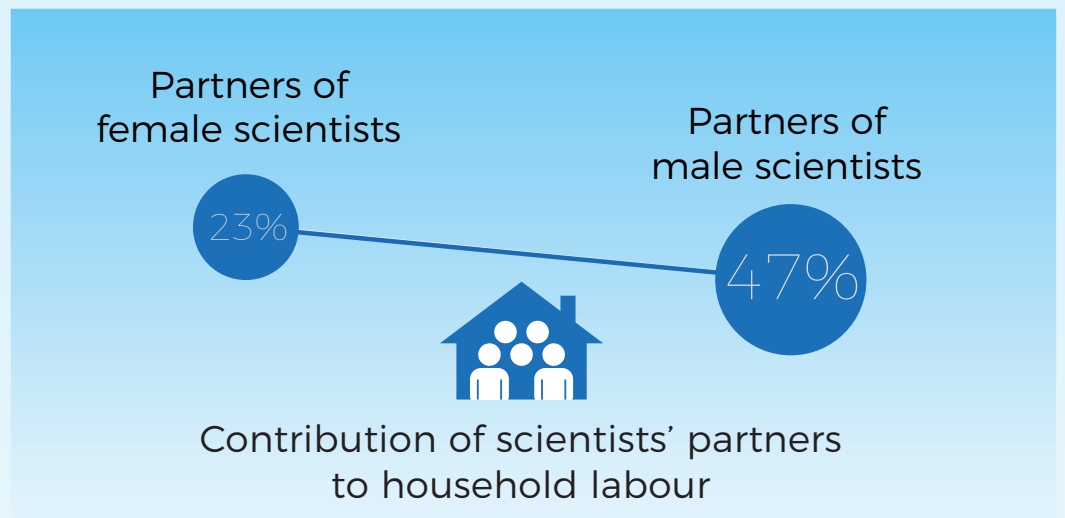
Gender social norms and the education pipeline

- Uganda has seen improvement in basic education enrolment of girls, although the country still faces low completion rates and poor performance for both girls and boys (Hailu et al., 2023).
- Girls and boys start their education on equal footing. Still, gender-related barriers such as higher domestic responsibilities for girls, a lack of access to menstruation management products and support, and poor households prioritising boys’ schooling over that of girls contribute to a growing gender gap as girls proceed through primary and secondary education (Tizikara, 2019). A lack of policy support for school-age mothers and the persistence of child marriage further impact girls’ education. As indicated in Table 1, the country has one of the region’s highest adolescent pregnancy rates and nearly half of Ugandan girls are married by age 18 (Organisation for Economic Co-operation and Development, 2023; UNFPA, 2020).
- Gender stereotypes about science shape girls’ participation and performance in science, technology, engineering and mathematics (STEM) subjects. Motivation for and interest in learning science subjects do not vary between boys and girls in lower secondary school; however, by the senior secondary level, male learners begin to lead in participation and performance (Hafkin, 2016; Kwarikunda et al., 2021). Girls are made to believe that some subjects, such as science and technology, are associated with masculinity and are much harder for women than men. Moreover, teachers’ and parents’ lack of proper mentorship and exposure to gender-biased advice lead to negative attitudes toward STEM careers. Gender bias among teachers in Uganda remains prevalent and is a significant barrier to achieving gender equality, as teachers play a powerful role in setting norms (UNESCO, 2021b).

- At the tertiary level, there has been a consistent rise in the number of women studying sciences in Uganda. However, significant gender disparities prevail in economically marginalised rural areas of the country. These disparities can be attributed to under-resourced schools in rural areas, which result in fewer qualified female learners for tertiary programs. This underscores the need for higher education policies that address intersections between gender and geography as drivers of inequality (Odaga, 2020).
- Sexual harassment and violence in higher education also negatively impact women's tertiary educational attainment (Kebirungi, 2021).

Gender-science norms and the STI career progression environment

- In 2014 women constituted 30% of researchers in the country (Unesco Institute for Statistics, 2021).
- Under-representation of women in STI in SSA is better explained by discriminatory practices that prevent women's participation in science than by supposed preferences for or aptitude in STI. Gender-science leaks emerge in women's tertiary education participation, affect completion rates and continue as leaks or blockages in their research career trajectory. Gender-science stereotypes are perceptions that connect scientific achievements with men more than with women. The STI landscape is rife with gender-science stereotypes (Elu & Price, 2017; Huyer, 2019).
- Gender bias during grant review processes impacts women's success in securing research funding (Sato et al., 2021). A continent-wide study found that men received more funding than women in engineering and applied sciences (Fisher et al., 2020).
- Other factors constraining women's participation in STI include workplace sexual harassment, gender pay gaps, low job security for young women scientists who often hold contract positions, and a lack of mentors and role models (Mukhawana et al., 2020; Prieto-Rodriguez et al., 2022; Prozesky & Mouton, 2019). In academic institutions, women scientists generally have higher teaching, supervisory and administrative loads, leaving less time for publishing and fundraising. Interestingly, when controlling for this additional workload, women researchers in Africa publish more than their male peers (Beaudry et al., 2023).
- Overwhelmingly, the most widely cited structural barrier to women's full participation in STI is unequal gendered beliefs and expectations about their role as caregivers (Beaudry et al., 2023; Fisher et al., 2020; National Academies of Sciences, Engineering, and Medicine, 2020). A study about African scientists' career experiences notes that balancing work and family life was reported as the most significant career challenge for 80% of women researchers. Overall, male scientists' partners contributed a much higher percentage (47%) than women scientists' partners (23%) to alleviating the household labour burden (Prozesky & Mouton, 2019).



- A study conducted in 17 African countries, including Uganda, compares the performance of men and women in STEM PhD programs (Fisher et al., 2020):
 - Men and women had similar completion rates, but women took longer to earn their PhD. This was attributed to women being more likely than men to take a break due to family reasons such as having children (11% of women compared to 2% of men). This delay in completion time for women is known as the 'motherhood penalty'.
 - Women with a female supervisor, who attended an institution with gender policies in place, and pursued their PhD in a department where sexual harassment by faculty was perceived as uncommon were more likely to complete their program on time.
 - Marriage during PhD studies had different impacts on men and women. Women's publication productivity decreased, while men's increased, likely due to changes in domestic responsibilities associated with marriage. Research consistently shows that marriage benefits men while disadvantaging women regarding the division of household labour.
 - Gendered relationship norms are also relevant. The study notes that 33% of married women felt compelled to downplay their successes and career prospects to avoid conflicts with their spouses.
- Interventions to address gender-related barriers in STI environments include implementing family-friendly policies and facilities that support women's roles as mothers, incentivising men's involvement in childcare, addressing workplace sexual harassment, and creating broader networks and linkages for women in STEM fields including mentoring and supervisory support (Fisher et al., 2020; Prieto-Rodriguez et al., 2022).

- Networks of stakeholders with interest and influence in advancing gender and inclusivity in STI in Uganda aim to create an enabling and empowering environment for women in science. An example of such a stakeholder include Eastern Africa Network for Women in Basic Sciences that aims to promote gender balance representation in the basic sciences, on all levels from primary to tertiary education in East Africa. The network promotes equality among boys and girls and men and women and motivates girls and women to take on science-based education and careers.

Conclusion

Harnessing 100% of the country's human development for accelerated socio-economic development is entrenched in policy instruments across the STI pipeline. The Ugandan Government has taken comprehensive policy measures to promote gender equality. While the country has made remarkable progress over the past decades to improve the rights protections of women, the impact of national gender policy is tempered by uneven implementation and structural barriers to equality, and the fallout is evident in persisting discrimination against girls and women across critical development domains.

In Uganda's policy context, gender equality and inclusivity considerations are conceptualised mainly in terms of male/female disparities. Social exclusion and disadvantage based on social factors beyond gender – such as disability, ethnicity, gender diversity, rural/urban location, and socio-economic status – are generally not meaningfully engaged in policy. Applying an intersectional lens to gender-related policy concerns will provide a more nuanced understanding of the interlocking systems of inequality that place women and other marginalised groups at a disadvantage in STI.

The absence of up-to-date education and R&D data disaggregated by sex, gender, and other diversity stratifiers hampers the ability of Government and other STI stakeholders to monitor policy implementation and impact. Moreover, very few science granting councils in Africa collect and make available gender and diversity-related data in their research and grants management processes (Global Research Council, 2021).

Publication trends show that Uganda is making strides in growing knowledge production on gender-related topics. Further investing in research to define and drive intersectional gender equality in STI is vital. Insights gleaned from such research will deepen understanding of the lived experience of girls and women in their diversity. Research to better understand gender and STI policy implementation gaps is also critical. These efforts will help the country attain equitable social, political and economic development outcomes for its entire population.

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