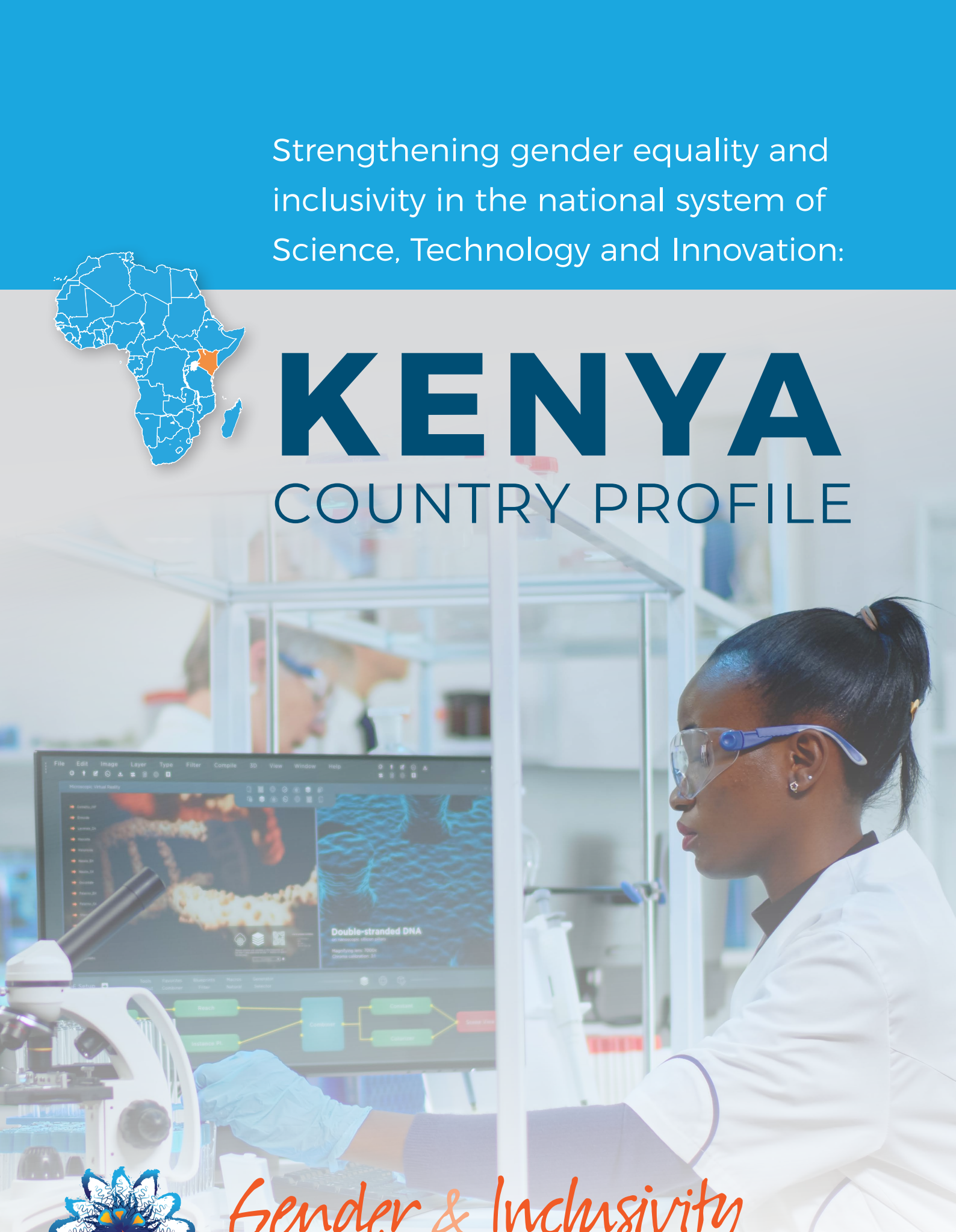
Strengthening gender equality and inclusivity in the national system of Science, Technology and Innovation:

KENYA

COUNTRY PROFILE



Gender & Inclusivity

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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 Kenya 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.

Acknowledgements

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Country overview

Kenya in Eastern Africa shares borders with Ethiopia, Somalia, South Sudan, Tanzania and Uganda (The World Bank, 2022).

Women and girls constituted 50,3% of the total 53 005 614 people in 2021. Almost three-quarters (72%) of the population live in rural areas. Poverty has declined nationally from 46,8% to 36,1% and from 50% to 38,8% in rural areas in 2015 (The World Bank, 2022).

Poverty, income inequality, and natural resource degradation are severe problems in Kenya, especially in rural areas (The World Bank, 2018). The country is therefore vulnerable to external impacts, particularly climatic ones (The World Bank, 2022). Kenya has been a target of terrorist activity and has struggled with instability along its north-eastern borders.

The country's largely agrarian economy employs 54% of the total number of employed people. Almost half (49%) of the employed people are in vulnerable employment, e.g., contributing as family members and own-account workers. Approximately 69% of employed women are in vulnerable employment vs 52% for men (The World Bank, 2022).

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

- Significant challenges remain for ending poverty, hunger (SDGs 1 and 2), and good health and well-being (SDG 3).
- The country is improving on quality education (SDG 4).
- Access to clean water and sanitation has stagnated (SDG 6).
- Gender equality (SDG 5) shows progress, but critical gaps exist.
- Only 41,8% of indicators are available for monitoring Kenya's SDGs from a gender perspective, with critical data gaps in unpaid care and domestic work, key labour market indicators 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 Kenya's human potential for socio-economic development

- Gender inequalities are associated with laws, cultural norms and practices that hamper women's and girls' access to opportunities, resources and power. Structural drivers of gender inequality such as unequal gender roles and power relations between men and women persist across all social institutions, resulting in multiple forms of discrimination against girls and women (Alpin-Lardiés et al., 2019).
- The country has made 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 (Table 1, SIG Index) (Organisation for Economic Co-operation and Development, 2023).
- 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).
- Social studies in Kenya report high tolerance for people of other religions (91%), ethnicities (93%) and immigrants and foreign workers (77%) and very low tolerance (9%) for people of different sexual identities or orientations at 9%. Gender-based discrimination is high for women and men at 15% and 13% respectively (Howard, 2020).
- Structural drivers of gender inequality result in Kenya 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 Kenya

Human Development Index (HDI) (UNDP, 2021)	
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.	Kenya had an HDI of 0,601 in 2019 vs 0,575 in 2021. The country ranks 157th out of 191 countries on the HDI.
Gender Inequality Index (GII) (UNDP, 2021)	
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.	Kenya has a GII value of 0,506, ranking 128 out of 191 countries in the 2021 index. When the sub-indices disaggregate this value, a more nuanced picture of imbalances emerges. ● Women hold only 23,2% of parliamentary seats, slightly lower than the sub-Saharan Africa average of 25,7%. ● 31,3% of adult women have reached at least a secondary level of education, compared to 37,7% of their male counterparts; the figures are like the SSA of 31,1% for women and 44,3% for men. ● For every 100,000 live births, 342 women die from pregnancy-related causes, which is high but lower than the (SSA) average of 536. ● The adolescent birth rate is 64,2 births per 1 000 women of ages 15-19, lower than the SSA average of 101. ● Female participation in the labour market is 69,2%, compared with 77,8% for men. The figures are higher than the SSA average of 62,1% for women and 72,3% for men.
Social Institutions & Gender Index (SIGI) (Organisation for Economic Co-operation and Development, 2023)	
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.	At 35,4% in 2023, Kenya's social institutions showed a very slight decrease in discrimination against women compared with 35,5% in 2019. Discrimination in Kenya is highest in access to productive resources and lowest in restricted civil liberties. ● Restricted access to productive and financial resources (44,7%) 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. ● Family discrimination (40,1%) 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 (30,6%) 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 civil liberties (25,8%) 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)	
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.	With a GGGI value in 2022 of 0,73, Kenya has closed 73% of its gender gap, ranking 57 out of 146 countries. Still, resources and opportunities need to be equal between men and women. When the sub-indices disaggregate this value, a more nuanced picture of imbalances emerges, with greater parity on health and survival and stark inequalities in access to political empowerment. ● Health and survival (98%) evaluate parity in sex ratio at birth and years of healthy life expectancy. ● Educational attainment (94%) evaluates parity on literacy rate and percentage enrolments in primary, secondary, and tertiary education. ● Economic participation and opportunity (81%) 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 (19%) 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

- The **2010 Constitution** of Kenya anchors the development of the country's science, technology, and innovation sector, recognizing the crucial role of science in advancing the nation. It emphasizes the importance of academic freedom and freedom of scientific research, the role of science and indigenous technologies in development, and national values and governance principles, such as equity, inclusiveness, and gender equality (Republic of Kenya, 2020).
- The current organization of the STI landscape in Kenya is principally guided by **Vision 2030**, launched in 2008, under the authority of the **Ministry of Education, Science and Technology**. The 2030 vision called for changes to the sector, emphasizing the need for strong science, technology, and innovation (STI) policy and performance management frameworks (Fosci et al., 2019).
- **Vision 2023** calls for intensified application of STI to raise productivity and efficiency levels and accelerate economic development with an STI policy framework. One element of the Vision 2030 is to achieve equality in the distribution of power and resources between genders, improve the livelihoods of vulnerable groups, and cultivate responsible and globally competitive youth (Government of the Republic of Kenya, 2007).
- The enactment of the **2013 Science, Technology and Innovation Act** established three institutions to regulate, coordinate and support STI within the context of Vision 2030: Kenya National Innovation Agency (KENIA), the National Commission for Science, Technology, and Innovation (NACOSTI), and the National Research Fund (NRF) (Republic of Kenya, 2020).
  - **NACOSTI** regulates and advises the government on STI matters and consults with stakeholders to develop scientific, innovation and research priorities based on national social and economic policies and international commitments such as the Sustainable Development Goals, the Africa Agenda 2063 and the targets of the Science, Technology and Innovation Strategy for Africa (STISA) 2024; and coordinates and fosters synergies between the various agencies and partners involved in science, technology and innovation.
  - **KENIA** develops and manages national innovation systems.
  - **NRF** mobilizes resources to facilitate research for advancing science, technology and innovation in line with national priority areas.
  - **Academic and research institutions** develop the required science and technology capabilities and research expertise to implement policy priorities effectively. They also generate, curate, and distribute new knowledge and technologies to inform product development.

- Kenya published a draft **STI Policy 2008**, **revised in 2020**, to operationalize the 2023 vision (Republic of Kenya, 2020).
- In the draft **2020 STI Policy**, the philosophy of research for socioeconomic transformation, global competitiveness and sustainable development underpins the vision of an accelerated transition to a knowledge-based economy. The policy charges academic and research institutions to develop the required science and technology capabilities and research expertise to implement STI policy priorities effectively. The 2020 policy outlines the principles of empowerment and participation of women, youth and persons with disabilities and equity and inclusiveness (Republic of Kenya, 2020).
- Kenya's scientific **peer-reviewed publications and patents**, used as a measure of research and development (R&D), indicate the following:
  - Kenyan researchers increased their publication outputs from 648 papers in 1996 to 5435 in 2022 with a cumulative total of 55708 ranking 9th out of 58 African countries.
  - The country's percentage contribution to Africa's publications declined from 4,65% in 1996 to 3,33% in 2022.
  - Papers are largely related to Medicine, followed by Agriculture and Biological Sciences, then Environmental Sciences, Social Sciences, Biochemistry, Genetics and Molecular Biology.
  - The proportion of papers written with international partners has increased from 62% in 1996 to 79% in 2022 (Scimago, 2023).
  - During 2008-2017 Kenya's number of gender-related publications increased by 3% (Jackson et al., 2022).

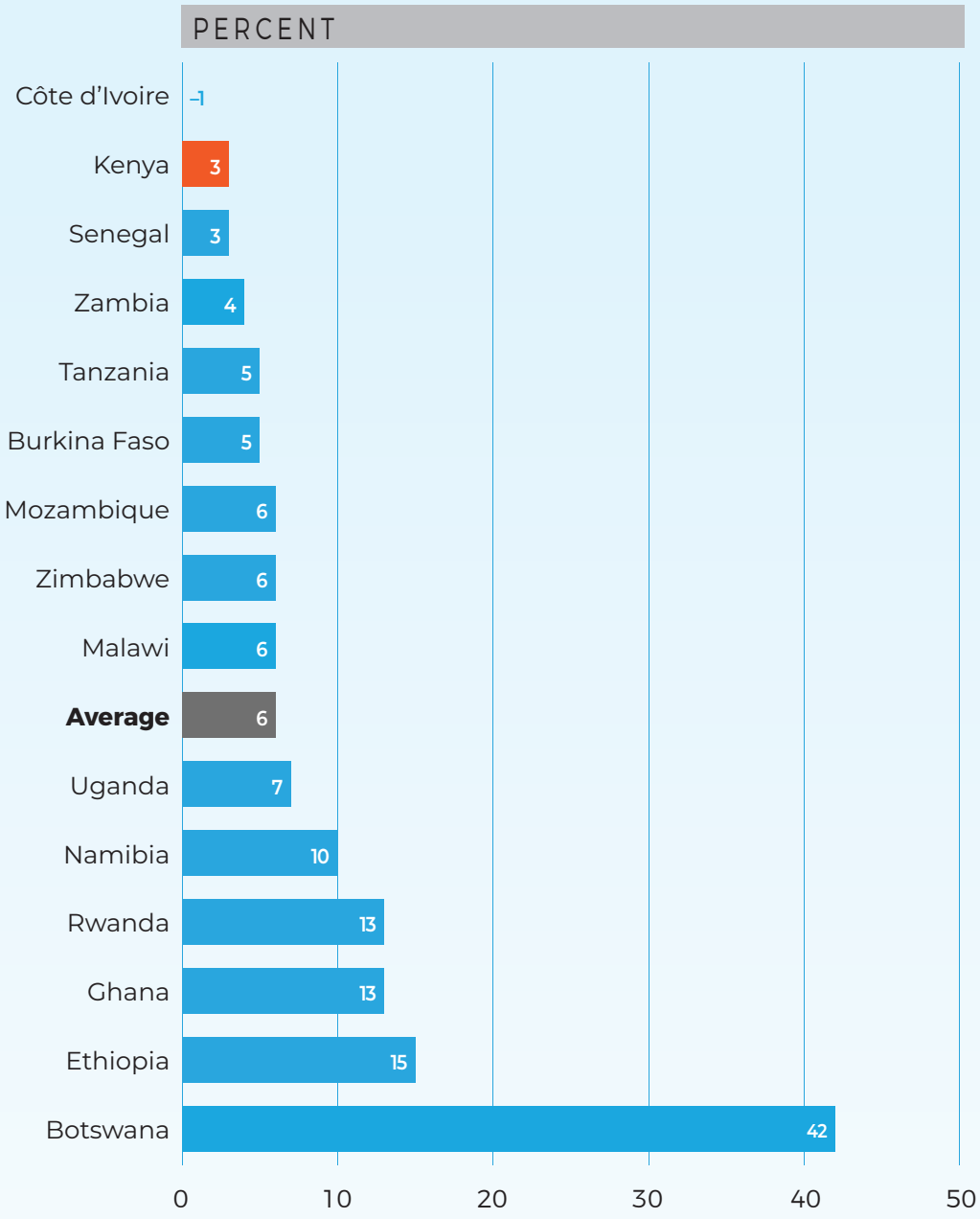


Figure 1: African SGCI participating countries: percentage (%) increase in publications with gender-related content between 2008 and 2017

Status of human capital for STI

- Gender disaggregated data gaps paint an incomplete picture of the status of human capital for STI in Kenya. A lack of regular data reporting on the researcher pool 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). Unfortunately Kenya does not contribute data to the UNESCO Institute for Statistics data base.
- Kenya hosts 225 full-time researchers per million inhabitants (Republic of Kenya, 2019a, 2020).

- Kenya has less than 10,000 PhD holders with only 689 PhD students graduating from public Universities in 2021. In 2018 10,000 students enrolled in PhD programmes nationally but the attrition rate of 20% means that the country is not producing sufficient numbers of researchers (Fosci et al., 2019; Republic of Kenya, 2022).
- Overall, 60% of researchers are employed in higher education, 20% are in government, and the remainder are split between the private, non-profit and commercial sectors (Fosci et al., 2019).
- Only 1 in 5 researchers are female, which is higher than in other countries like Ethiopia but is still considerably behind the African average of 31,6% female researchers (Fosci et al., 2019).
- Although there has been some improvement in enrolment in STEM fields, participation rates in labour market opportunities need to reflect this. Women constitute 50% of the labour market, yet only 28% are in STEM; the rest are men (Amunga & Musasia, 2021).
- Figure 2 shows that the disparity between men and women qualified in selected STEM fields is minimal in medicine, with men (15 818) comprising 56% and women (12 497) including 44% of this field (Amunga & Musasia, 2021).
- Engineering and Technology disciplines have unprecedented disparities, with men (283 514) comprising 92% while women (24 177) include 8% of this field (Figure 2) (Amunga & Musasia, 2021).

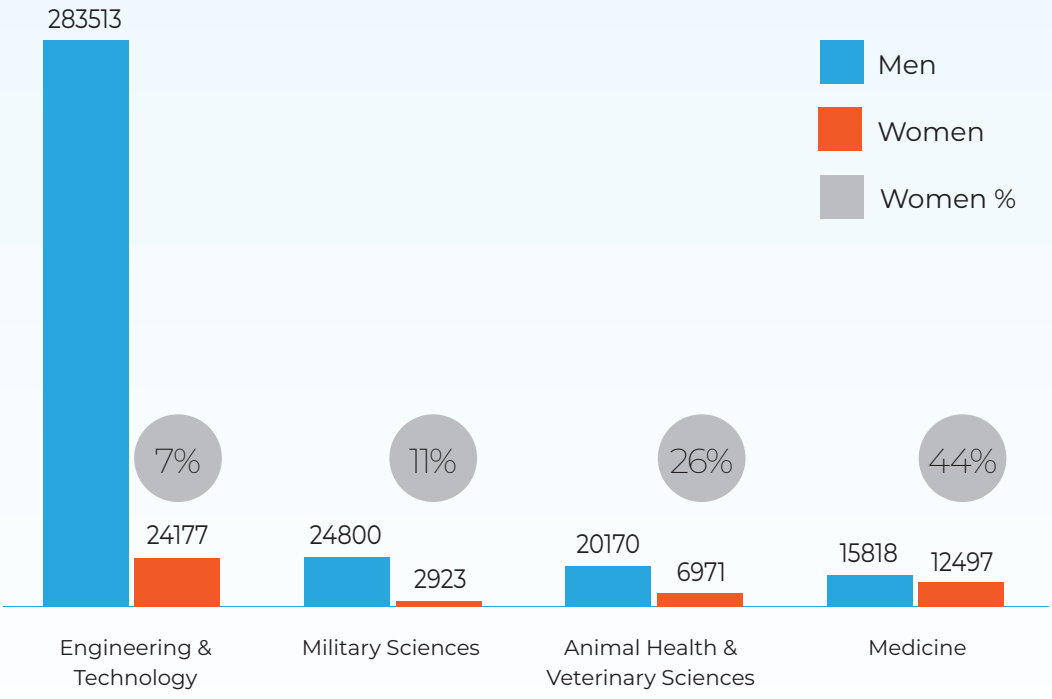


Figure 2: Women and men above 15 years of age trained and qualified in selected STEM fields, 2019

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

Policy and frameworks

- The focus on addressing gender disparities and inclusivity has grown significantly between the STI policy of 2008 and 2020. The **2008 STI Policy** aimed to improve gender representation and leadership in STI institutions and establish a policy framework to address the gender imbalance in the sector. The **2020 STI Policy** builds significantly on this goal, introducing the principles of empowerment and participation of women, youth and persons with disabilities and equity and inclusiveness. The policy outlines gender disparities across the STI pipeline and promotes gender mainstreaming in STI as one of nine policy objectives with a cross-cutting presence (Republic of Kenya, 2008, 2020).
- The **Gender Equality Commission Act 2011** outlines the purpose of the Gender Commission, which is to ensure impartiality, gender equality and gender equity in government policy and programmes, facilitate gender mainstreaming across sectors, monitor the integration of these principles in all public and private institutions, undertake equality research, and advise the government on these matters. This Act references special interest groups, including minorities, marginalized persons, women, persons with disabilities, and children (Frosina & Mwaura, 2016; Njiru, 2020).
- The State Department for Gender in the Ministry of Public Service, Youth and Gender is responsible for promoting gender equality and women empowerment in Kenya. In 2019 the Department adopted the **National Gender and Development Policy (2019)** after an extensive review of the 2000 policy. This policy aligns with Vision 2030 and aims at achieving "equality of opportunity and outcomes with respect to access to and control of national and county resources and services; and equality of treatment that meets the specific and distinct needs of different categories of women and men." (Republic of Kenya, 2019b, p.6).

- The **Kenya National Education Sector Strategic Plan 2018-2022** regards reducing gender disparities in access, retention, and completion as a policy priority at all levels of education, from primary through tertiary. The guide cites several strategies for advancing gender parity in education, including gender-sensitive and low-cost accommodation, provision of sanitary towels, and clean water, guidelines on gender-based violence and methods for preventing teenage pregnancy (Republic of Kenya, 2019a; 2021). However, national education plans lack comprehensive gender policies with specific monitoring and evaluation guidelines. For example, very few educational policy statements guide how to address poverty, sexual maturation, early marriages, adolescent pregnancy and gender violence in education in a manner that can be interpreted and implemented easily (Njiru, 2020).
- The **Convention on the Elimination of all Forms of Discrimination Against Women (CEDAW)** in Kenya aims to eliminate discrimination. It is committed to upholding the rights of women (United Nations, 2000).
- The country has a **School Re-entry Policy** (2020) that protects girls' right to stay in school during pregnancy "for as long as possible" and to return six months after birth, thus reducing gender-related barriers to girls' educational attainment (Human Rights Watch, 2022).

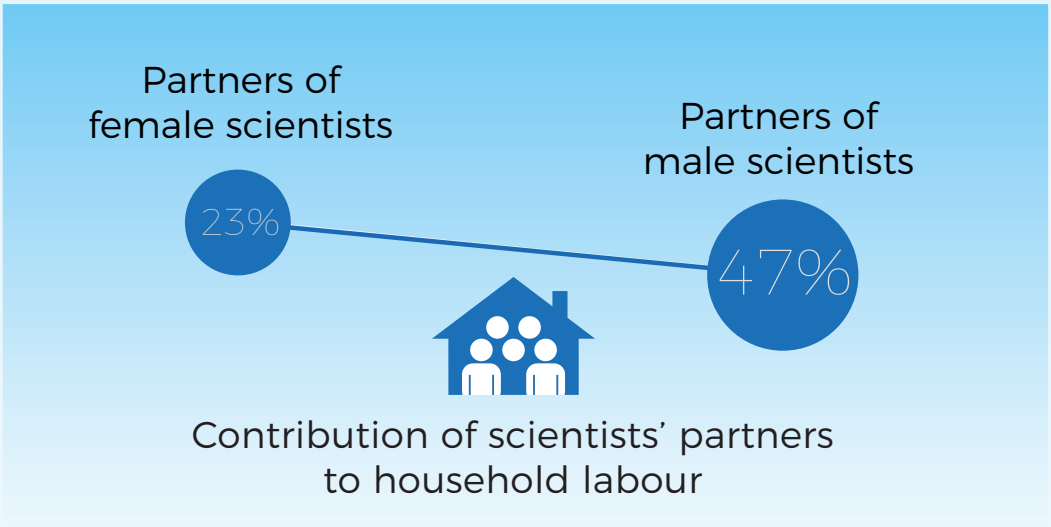
Gender social norms and the education pipeline

- Kenya has largely achieved parity in primary and secondary education attainment rates. Still, as the 2019 survey shows, adult Kenyans perceive access to post-secondary education for girls to be worsening (Republic of Kenya, 2019a).
- Only 38,4% of children transition from primary to secondary school (40,9% for boys and 35,8% for girls), and of those who do, only 8% move on to tertiary education (Republic of Kenya, 2019a).
- The proportion of women enrolled in all tertiary education programmes is low, ranging from 35% in 2005 to 39% in 2011 (latest available data) (Amunga & Musasia, 2021; Republic of Kenya, 2019a).
- Despite Kenya in 2010 having a solid scientific publishing record and many researchers, only 26% of researchers in Kenya were women.
- Gender imbalance exists in secondary and tertiary education, with female enrolment at the secondary level being lower (65%) than male enrolment (70%) and lower at tertiary level (3,3%) vs 4,8% for men (Amunga & Musasia, 2021; Republic of Kenya, 2019a).
- Indicators tracking gender equality in human development (Table 1), though, do reveal contributing factors for gender gaps and disparities linked to Kenya's loss of human development potential across the life course, including relating to STI.

Gender science norms and the STI career progression environment

- Only 1 in 5 researchers are women (Fosci et al., 2019).
- 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 Kenya, 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 Kenya aim to create an enabling and empowering environment for women in science. Examples of such stakeholders include Kenya's National Commission for Science and Technology (NACOSTI) who designate funds to enable women scientists to conduct research; the Nairobi-based African Academy of Sciences (AAS) who allocate travel grants to support women scientists to travel to conferences to present their research findings; the Eastern Africa Network for Women in Basic Sciences (EANWoBAS) which aims to increase the number of women through mentorship for female students, organizing outreach activities and school visits, and opt for gender awareness in teaching; and the UNESCO/ GoK STEM Mentorship Programme which address inequality among boys and girls and men and women and motivate girls and women to take on science-based education and careers (UNESCO, 2021b).

Conclusion

Harnessing 100% of the country's human development for accelerated socio-economic development is entrenched in policy instruments across the STI pipeline. The Kenyan 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 Kenya'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 Kenya is making strides in growing knowledge production but less so 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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