SADC Gender in STI Fact Sheets

Gender Monitoring in STI in support of SADC Protocols on Science Technology and Innovation and Gender Development

science & innovation

Department:
Science and Innovation
REPUBLIC OF SOUTH AFRICA

Gender
InSITE

ASSAf
ACADEMY OF SCIENCE OF SOUTH AFRICA

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SADC Countries Fact Sheets

Abbreviations/Acronyms

ASSAf	Academy of Science of South Africa
BAS	Botswana Academy of Sciences
BITRI	Botswana Institute for Technology Research and Innovation
CREST	Centre for Research on Evaluation, Science and Technology
DBE	Department of Basic Education
DST	Department of Science and Technology
FAO	Food and Agricultural Organisation
FAWENA	Forum for African Women Educationalists Namibia
FAWESWA	Forum for African Women Educationalists – eSwatini
FET	Further education and training
GDP	Gross domestic product
GEMS	Global Education Management Systems
GenderInSITE	Gender in Science, Innovation, Technology, and Engineering
GERD	Gross expenditure on research and development
GET	General education and training
GIT	Girls in technology
HCDS	Human Capital Development Strategy
HRDC	Human Resources Development Council
HRD-SA	Human Resource Development Strategy South Africa
HSRC	Human Sciences Research Council
ICT	Information, communication and technology
MICS	Multiple Indicator Cluster Survey
MOSTIS	Mozambique Science, Technology, Innovation Strategy

MTSF	Medium-Term Strategic Framework
NDP	National Development Plan
NRF	National Research Foundation
NGOs	Non-governmental organisations
NRDS	National Research Development Strategy
NSC	National Science Council
NSW	National Science Week
OWSD	Organisation for Women in Science for the Developing World
R&D	Research and development
RIMS	Research Information Management System
RIS	Research, innovation and scholarship
RSTI	Research, science, technology and innovation
S&T	Science and technology
SADC	Southern African Development Community
SET	Science, engineering and technology
STEM	Science, technology, engineering and mathematics
STEMI	Science, technology, engineering, mathematics and innovation
STI	Science, technology and innovation
TIMSS	Trends in International Mathematics and Science Study
TYIP	Ten-Year Innovation Plan
UNESCO	United Nations Educational, ScientificandCulturalOrganisation
WEGSA	Women Engineers and Girl Scientists in Africa
WiSET	Women in Science, Engineering and Technology
WISTNET	Women in Science and Technology Network

Foreword

Gender is defined by the Food and Agricultural Organisation (FAO) as "the relations between men and women, both perceptual and material. Gender is not determined biologically, as a result of the sexual characteristics of either women or men but is constructed socially. It is a central organising principle of societies and often governs the processes of production and reproduction, consumption and distribution" (FAO, 2015). Despite this definition, gender is often misunderstood as being the promotion of women only. However, as we see from the FAO definition, gender focuses on the relationship between men and women, their roles, access to and control over resources, division of labour, interests and needs. Based on the above definition, gender mainstreaming is a strategy or an approach for ensuring gender equality. The combined perspectives of both men and women should be part of any planning, implementation and monitoring of programmes and projects especially aimed at policy development. In detail it addresses the following:

- Experiences, aspirations, knowledge, needs and concerns of both men and women are integrated into the formulation of policies and decision-making; planning, programming and budgeting. It also ensures that there is monitoring and evaluation of progress achieved and that the obstacles encountered are mutually addressed by both men and women.

- Women's participation should be equal to and on an equal basis with men in all activities and at all levels as a strategy towards gender equality.

Gender mainstreaming is not without its problems. For example, often the issue of gender equity is not considered when implementing gender mainstreaming. This, of course, has implications for monitoring and evaluation processes. Gender equity, unlike equality, recognises that men and women may have different experiences, needs and preferences. Therefore, resources need to be allocated considering this. It is essential to monitor and evaluate the outcomes of both gender-focused and mainstreamed development interventions and policies so, where possible, gender monitoring should also be integrated into any ongoing activities, projects and programmes. This is done when an assessment of the design and planning (objectives, results pursued, activities planned), implementation and results of an ongoing activity, project, programme or policy has a gender perspective.

The gender dimension of science, technology and innovation has become an increasingly important topic worldwide. For policies and programmes to have a more significant effect on the lives and livelihoods of both men and women, there needs to be careful consideration of the gender dimensions of the data collected on science technology and innovation (STI), for further improvement where necessary, as well as for socio-economic changes. Gender disaggregated data in STI enables policymakers to have an overview of the conditions that affect women's participation in STI, ranging from educational opportunities to economic standing and employment in STI fields. Much of the data that is collected tends to focus on the formal science and technology (S&T) system, for example, enrolments in higher tertiary educations. Data from other sectors affecting STI policies should be included to give a comprehensive perspective.

Besides the above necessary measures, some approaches to data collection and monitoring which have proved to be successful are gender-responsive budgeting, gender analysis for technology development, and monitoring mechanisms in policies. Central to these approaches are gender impact assessments to provide useful insight and guidance to the policymaking process.

SADC Protocol on Gender and Development

In this context, and given its mandate, the Southern African Development Community (SADC) has an interest in gender and how it relates to STI. The Protocol on Gender and Development signed in 2008 was revised in 2016 to include mainstreaming gender in STI, and in turn, some measures for monitoring by governments. The protocol has several provisions that seek to facilitate gender mainstreaming into institutions for the attainment of gender equality and equity. The protocol is a significant achievement for the sub-region and sets specific targets which are aligned to the Sustainable Development Goals (SDGs), Beijing Plus Twenty and the African Agenda 2063. It is also strengthened by monitoring, evaluation and results framework. The potential of men and women is still to be realised through effective implementation of the protocol, especially in the area of STI. Science and technology are addressed in the section on education of the protocol that states that state parties shall take special measures to increase the number of girls studying science, technology, engineering and mathematics (STEM) and information, communication and technology (ICT) at secondary, tertiary and higher levels.

The SADC Gender Fact Sheets

The Academy of Science of South Africa (ASSAf), supported by the South African Department of Science and Innovation (DSI), hosting the Gender in Science, Innovation, Technology and Engineering (GenderInSITE) focal point for Africa in partnership with SADC Science, Technology and Innovation, SADC Gender, Botswana Institute for Technology Research and Innovation (BITRI) and the Botswana Academy of Sciences (BAS) compiled fact sheets. The fact sheets are an outcome from the workshop aimed at bridging the gap between policy and practice in terms of gender monitoring and evaluation in STI and how the SADC protocol on gender and development relates to STI. The workshop was an opportunity to profile GenderInSITE and the Organisation for Women in Science in the Developing World (OWSD) as regional initiatives promoting gender, STI and development.

The workshop brought together gender and STI representatives from SADC member states to present an update on progress made in gender monitoring and evaluation for STI in their respective countries and the gender in STI activities which relate to the gender protocol and other relevant high-level documents. This has provided baseline data and analysis on the achievements made so far without avoiding the challenges, and thus offer a platform from which to accelerate the implementation.

The GenderInSITE Africa focal point and the SADC have a close working partnership, having collaborated on a variety of activities that include the SADC STI Policy conference and input into the SADC Women in Science, Engineering and Technology (SADC WiSET) process and discussion. The fact sheets showcase what each country is doing to promote women in science, technology and engineering (WiSET).

It is intended, however, that the fact sheets will create many important 'connection points' to other projects of mutual interest for the partners and participants. It should be noted that more active participation is needed from the SADC countries in order to produce more accurate and relevant information to accelerate the progress on WiSET.

We acknowledge the contributions made by the SADC Secretariat and ASSAf teams with special thanks especially to Ms Anneline Morgan, Professor Roseanne Diab, Mr Stanley Maphosa and Ms Elzarie Swanepoel who have worked tirelessly to produce these fact sheets.

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Executive Officer
Academy of Science of South Africa

BOTSWANA

General Information

Key Statistics

- **Population** estimated as 2.3 million (2016)
- **Percentage of women** in population estimated as 51.15% (2011)
- **Literacy level**
  ◊ Whole population: 88.2% (2015)
  ◊ Women: 81.8 % (2003)
  ◊ Men: 80.4% (2003)
- **Enrolment of girls in schooling**
  ◊ Primary school: 87.9% (2008-2012)
  ◊ Secondary school: 65.6% (2008-2012)
  ◊ Tertiary school: 27.7% (2016)
- **Estimated government spending on education** 20.5% of the Gross domestic product (GDP) (2009)
- **Gross expenditure on research and development (GERD)** is 0.54% (2013/2014)
- **SET/STEM enrolments at tertiary level**
  ◊ Undergraduates: Not provided
  ◊ Masters: Not provided

Relevant policies

STI data is sourced from the Botswana National Survey of Research & Development, Ministries, Research, Science, Technology and Innovation (RSTI) organisations, education and the private sector. There is a need to accelerate the implementation of the Research Information Management System (RIMS) which would capture individuals outside the sample frame. Statistics Botswana and the Human Resources Development Council (HRDC) produce disaggregated data annually. The National Statistics Office provides data which is disseminated to obtain science, technology, engineering and mathematics (STEM) and gender-related information for decision-making. The National Chapter on Women is currently inactive.

Relevant interventions for women and STI

Supported by the United Nations Educational, Scientifi c and Cultural Organisation (UNESCO), Botswana is part of a Women Engineers and Girl Scientists in Africa (WEGSA) network that is addressing gender inequalities in science-based education and careers. The aim is to encourage girls to opt for the sciences so that more women become engineers (WEGSA, 2010). The Ministry of Education's Equal Opportunities Policy states that no individual shall face discrimination based on race, religion, social status, sex, marital status, and location (Gender Barometer, 2014).

Programmes for women and STI

- Forum for Women Engineers and Girl Scientists in Africa
- Science, Technology and Innovation Week
- Maths and science clubs

Progress on the establishment of the WiSET

The number of women in research and academic staff has increased since 2012. However, gender parity has not yet been achieved. Botswana has 48% of women enrolled in public institutions of higher learning and 39.2% of women academic and research staff in higher education institutions. (Source: SADC Gender and Development Monitor, 2016).

The National Chapter on Women is currently inactive.

Contact details for gender and STI

Ministry of Tertiary Education, Research Science and Technology Department of Research Science and Technology Private Bag 007, Gaborone, Botswana Physical: Fairgrounds Office Park, Plot 61923. Tel: +267 397 2255	Ministry of Labour and Home Affairs, Gender Affairs Department Block 8, Government Enclave, Khama Crescent. Private Bag 002. Gaborone. Botswana. Tel: +267 361 1100/361 1115/361 1132

References

Data.worldbank.org. (n.d.). [Online] Available at: https://data.worldbank.org/ [Accessed 2 Nov. 2017].

eSwatini

General Information

Key Statistics

- **Population:** According to the 2017 report on Population and Housing Census, the population of eSwatini is 1 093 238, comprising of 531 111 males and 562 127 females
- **Percentage of women** in population 51.4 % (The 2017 Population and Housing Census)
- **Literacy level**
  ◊ Whole population: 89.1% (2017 eSwatini Gender & Development Index)
  ◊ Women: 92% (Multiple Indicator Cluster Survey (MICS) 2014)
  ◊ Men: 95% (MICS 2014)
- **Enrolment of girls in schooling**
  ◊ Primary school: 79.4% (2014)
  ◊ Secondary school: 65.85% (2014)
  ◊ Tertiary school: 50.9% (2013)
- **Estimated government spending on education** 8.2% of the GDP (2008-2010)
- **GERD** N/A
  ◊ The gross expenditure on R&D as a percentage of the GDP 0.26% in 2016
  ◊ Total estimated GERD: E139 million in 2016

Relevant interventions for women and STI

There is a lack of programmes that specifically target women in terms of STI. Currently, the country is in the process of establishing the National Chapter on Women in Science, Engineering and Technology.

The National STI Policy

In eSwatini, several sector policies have been developed over the years in areas such as agriculture, energy, the environment and many more. The National STI Policy has singled out the National Gender Policy as one sector policy that directly relates to STI and STEM.

The National Gender Policy, sector policy 9, enacted in 2010

Vision/Philosophy: The attainment of a sustainable environment in which girls and boys, men and women will have equal opportunities to participate in and to benefit from all aspects of development and at all levels for the improvement of quality of life.

FAWESWA

Forum for African Women Educationalists – eSwatini Chapter (FAWESWA), an organisation to promote girls' and women's education in eSwatini by making sure they have access to schools and can complete their studies and fulfil their potential, in line with the UNESCO's Education For All movement. FAWESWA is actively involved in promoting the girl child to explore the traditionally "male" - dominated fields of study including STEM.

Relevant policies

National Gender Policy (2010)

Policy vision

A eSwatini where women, men, girls and boys have similar opportunities to participate freely as equal partners in all spheres of public life, including all decision-making processes and have fair access to and control over resources.

Education and training

The government of eSwatini believes that education is a fundamental human right and both formal and informal education plays a vital role not only in socialisation but in development as well. This is further supported by the government policy on education, which promotes equal accessibility and availability of quality education to boys and girls.

However, the government's concern is that although the enrolment of both boys and girls is about the same at primary level, statistics show a significant decrease in the number of girl children at higher levels of education, particularly in the science-related fields. The high attrition rate among girls at higher levels of the education system can be attributed partly to behavioural practices such as the early marriage of the girl child and high levels of unplanned and unsupported pregnancies.

Gender equity (Education)

Women play an essential role in national development activities, hence the need to encourage girls to take science, technology and engineering education so as to provide opportunities for them to participate actively in the promotion and utilisation of science and technology at a later stage.

Progress on WiSET

The overall enrolment in STEM programmes is very low at the University of eSwatini (UNISWA), from 2009 to 2016 there has been no significant changes in female students' enrolments. The number of male students who enrol in sciences is twice that of women.

Recent results as contained in the University of eSwatini Report of the Vice-Chancellor (2016 – 2017) revealed the following:

Student Enrolment by Programme and Gender – Faculty of Science & Engineering

Year of Study	BSc Programme				B Eng Programme			
	Male	Female	Total	%Female	Male	Female	Total	%Female
1	74	33	107	31	22	3	25	12
2	70	31	101	31	20	6	26	23
3	52	22	74	30	19	4	23	17
4	43	23	66	35	20	4	24	17
5					10	0	10	0
	Percentage on average			32	Percentage on average			14

Research

While R&D investment in eSwatini is very low, the number of female researchers is even lower, as shown in the Table below. There are more male researchers with PhD qualifications than there are females as shown in the Figure below. While males dominate their female counterparts in terms of qualifications, there are 11.8% more females with a Bachelor's degree than males. Females also dominate in health sciences. However, there are fewer females especially in the natural sciences and engineering fields (see Table above).

Table: Headcount of Research and Development Personnel

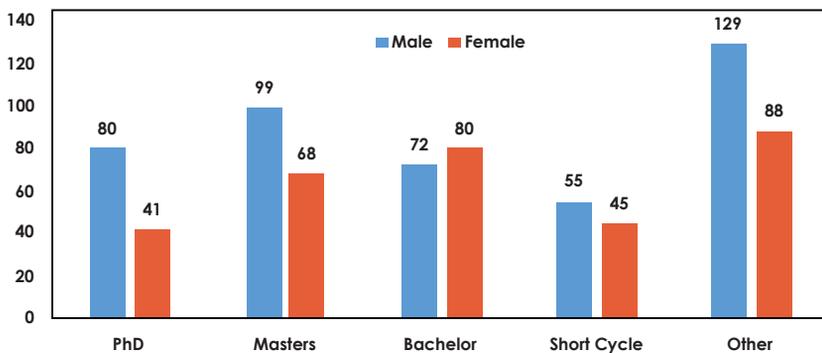| Occupation	Male	Female	Total
Researchers	211	149	360
Technicians	52	40	92
Support	172	133	305
Total	**435**	**322**	**757**

Source: eSwatini R&D Survey (2017)

Figure: Headcount of R&D personnel qualification by sex

Source: eSwatini R&D Surveys (2017)

Overall, natural scientists and engineers make up 9.5% of the total R&D personnel, with agricultural sciences very high at 31.7%. The Figure above presents qualification data of research and development personnel by sex and field of study.

Based on the available data, gender parity has not yet been achieved at the tertiary education level in eSwatini. Generally, enrolment in tertiary education seems to favour males, with a gender parity ratio of 0.96. At the tertiary institutions that offer technical subjects, the gender parity ratio shows a wide gap between males and females with the latter disadvantaged and scores range from 0.14 at Manzini Industrial Training Centre (MITC) to 0.79 at Limkokwing University. Enrolment in pure sciences subjects at UNISWA has not yet reached gender parity (0.84) with females disadvantaged.

Additional points

- There are more male researchers compared to women.
- There are more female graduates compared to male.
- The number of women graduates start to drop from PhD level and more on the research level.
- Overall, women have more qualifications than men, but not in STEM fields.

Contact details for gender and STI

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LESOTHO

General Information

Key Statistics

- **Population** estimated as 2.2 million people (2016)
- **Percentage of women** in population estimated as 51.5% (2016)
- **Literacy level**
  - ◊ Whole population: 76.6% (2014)
  - ◊ Women: 84.9% (2014)
  - ◊ Men: 67.7% (2014)
- **Enrolment of girls in schooling**
  - ◊ Primary school: 81.5% net (2015)
  - ◊ Secondary school: 45.3% net (2015)
  - ◊ Tertiary school: 11.7% gross (2014)
- **Estimated government spending on education** 11.4% of the GDP (2008)
- **GERD** 0.05% (2015)
- **SET/STEM enrolments at tertiary level**
  - ◊ Undergraduates: Not provided
  - ◊ Masters: Not provided

Relevant interventions for women and STI

Programme for women and STI

The Ministry of Communication, Science and Technology coordinates Lesotho Vision 2020 on the National Science and Technology Policy.

A project called Gender-sensitive Training of Teachers and School Principals for Girls' and Women's Access, Participation, and Advancement in Mathematics, Science and Technology Education was initiated in March 2011. This was established between UNESCO and the Global Education Management Systems (GEMS) Foundation for a total amount of US$1 million over four years.

The project aims to improve access to and advancement of girls and women in learning and teaching sciences, mathematics and technology in both Lesotho and Kenya, with an overall aim to achieve gender parity in education.[1]

In Lesotho, the lack of teachers in mathematics and science remains a big challenge. Therefore, the project also aims to increase the number of qualified and competent science teachers in schools, as well as ensuring teachers' gender awareness and sensitivity in scientific disciplines.[2]

Relevant policies

The Ministry of Education's 2005 – 2015 Strategic Plan guides education and training activities in Lesotho. The Ministry's sub-sectorial policies guarantee equal access to education and training for boys and girls, which include non-formal education, technical and vocational education, ICT, and teacher training. The ministry introduced a free primary education policy and the 2010 Education Act No 7, enforcing the right to education and making it free and compulsory for children to go to school. This has allowed even marginalised children, like herd boys, to access basic education.

Lesotho is one of seven SADC countries that now have more young women in tertiary education.

Women constitute over 51% of Lesotho's active labour force and population. The policy strives to assess progress in S&T affirmative action, encourage women's access and mobility into occupations requiring mathematics, natural sciences, engineering and S&T management.

S&T policy objectives and strategies

Create job opportunities and reduce poverty through the use of S&T by promoting meaningful participation of women in S&T management, health, teaching, R&D, etc.

S&T guiding principles

Science and technology policy advocates for investments, decisions and benefits that are gender-sensitive and that are proactively encouraging women and girls, where natural practices and customs limit their free access and equity.

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[1]UNESCO Global Partnership for Girls' and Women's Education - One Year On. (n.d.). [pdf] United Nations Educational, Scientific and Cultural Organisation. Available at: http://www.unesco.org/eri/cp/factsheets_ed/LS_EDFactSheet.pdf [Accessed 2 Nov. 2017].

[2]Ibid.

Progress on the establishment of the WiSET

After the 2012 SADC meeting which focused on WiSET, the Lesotho chapter was established, and a committee of women drafted the constitution.

Regarding the level of education of women on STI gender mainstreaming, the Department of Science and Technology provided the data on science education, which was obtained from the National University of Lesotho and the Ministry of Agriculture. The data showed that 21% of women participated in mathematics and science, 31% in agriculture, 24% in computer science, and 24% in biology and chemistry. Women in agriculture, biochemistry, computer science, mathematics and physics made up 4% of the professors. Of this, 24% had PhDs, 31% had Masters degrees, and 31% had BScs.

Contact details for gender and STI

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UNESCO Global Partnership for Girls' and Women's Education - One Year On. (n.d.). [ebook] United Nations Educational, Scientific and Cultural Organisation. Available at: http://www.unesco.org/eri/cp/factsheets_ed/LS_EDFactSheet.pdf [Accessed 2 Nov. 2017].

MALAWI

General Information

Key Statistics

- **Population** estimated as 18.1 million (2016)
- **Percentage of women** in population estimated as 50.5% (2016)
- **Literacy level**
  ◊ Whole population: 62.1% (2015)
  ◊ Women: 55.2% (2015)
  ◊ Men: 69.8% (2015)
- **Enrolment of girls in schooling**
  ◊ Primary school: 95.3% net (2008)
  ◊ Secondary school: 36% net (2015)
  ◊ Tertiary school: 0.62% gross (2011)
- **Estimated government spending on education** 5.6% of the GDP (2015)
- **GERD** 1.06%
- **SET/STEM enrolments at tertiary level**
  ◊ Undergraduates: Not provided
  ◊ Masters: Not provided

Relevant policies

The Malawi National Commission for Science and Technology is mandated to advise the government and all other stakeholders on science and technology matters.

The policies that influence science, technology and innovation in Malawi include the Science and Technology Policy, Gender Policy, SADC Protocol on STI, SADC Gender and Development Protocol, Education Policy.

STI subjects are compulsory in Malawi. Various policies promote gender equality in education. For example, the University of Malawi Act, in Section 12 A, makes provision for loan schemes to enable female students who lack funds to continue with their university education.

Relevant interventions for women and STI

Programmes

- Women in Science and Technology Network (WISTNET) launched and strengthened.
- Mentoring and bridging sessions targeting secondary school-girls.
- Role modelling & mentoring programmes conducted.
- TV/radio programmes on women in S&T conducted.
- High-school debates on STI.
- STI career talks.
- High-school science camps and fairs.
- Private sector participation through scholarships and awards.

Gender equality and STEM indicators

Malawi uses several indicators to determine gender dimensions in STI.

Some indicators are

- Percentage of women and men in research and development by sector (government, private, academia).
- Percentage of women and men in research and development by field of science (natural sciences, engineering, medical & health sciences, agricultural sciences, social sciences, humanities).
- Percentage of female and male students enrolled for STEM courses in public institutions of higher learning.
- Tertiary enrolment in STI courses by qualification level (undergraduate, Masters, PhD).
- Gross expenditure on R&D (GERD) as a percentage of GDP.
- Percentage of women and men with registered patents.
- ICT penetration and usage between female and male.

Progress on the establishment of the WiSET

- WISTNET was launched in 2009.
- WISTNET is aimed at promoting the participation of girls and women in STI.
- It will be transformed into WiSET in due course although the structures and operations will be the same as WISTNET.
- WISTNET activities include mentoring and bridging sessions for secondary school-girls, role modelling and mentoring programmes, and radio and TV programmes to encourage women in STI.

Contact details for gender and STI

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References

Data.worldbank.org. (n.d.). [online] Available at: https://data.worldbank.org/ [Accessed 2 Nov. 2017].

MAURITIUS

General Information

Key Statistics

- **Population** estimated as 1.26 million (2016)
- **Percentage of women** in population estimated as 50.6% (2016)
- **Literacy level (2015)**
  ◊ Whole population: 90.6%
  ◊ Women: 88.5%
  ◊ Men: 92.9%
- **Enrolment of girls in schooling**
  ◊ Primary school: 97.2% net (2015)
  ◊ Secondary school: 86.4% net (2015)
  ◊ Tertiary school: 41.7% gross (2015)
- **Estimated government spending on education** 4.9% of the GDP (2015)
- **GERD** 0.18% of GDP (2012)
- **SET/STEM enrolments at tertiary level**
  ◊ Undergraduates: Not provided
  ◊ Masters: Not provided

Relevant policies

Formulation of a National Gender Policy Framework, adopted in 2008.

Work has started with core ministries and departments outlining Mauritius' vision for gender equality and women's empowerment.

Relevant interventions for women and STI

Girls in technology (GIT) was founded in 2007 to help women advance their careers in STEM fields. GIT aims to accelerate the growth of innovative women entering the high-tech industry and empower them to build start-ups. One of the main recommendations of the Education Forum which was held from 10 – 12 July 2017 at Intercontinental Hotel, Balaclava, was the promotion of the leadership of women and girls as role models to boost girls' interest in learning STEM and prepare for future careers as scientific women.

The forum focused on the strategies for retention of girls and young women in educational systems. It was organised jointly by the African Union, the International Centre for Girls' and Women's Education in Africa and the Ministry of Education and Human Resources, Tertiary Education and Scientific Research.

Progress on the establishment of the WiSET

The enrolment of women in science, engineering and technology in Mauritius is gradually improving with at least 38% of enrolments in STEM being women. Women's participation in science and engineering, manufacturing and construction has also increased. The percentage of women in 2003 was estimated at 54% in STEM; and 19% thereof in engineering, manufacturing and construction (Huyer, Westholm, 2007).

Contact details for gender and STI

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References

Huyer, S. and Westholm, G. (2007) Gender indicators in science, engineering and technology. Paris: UNESCO.
Data.worldbank.org. (n.d.). [online] Available at: https://data.worldbank.org/ [Accessed 2 Nov. 2017].

MOZAMBIQUE

General Information

Key Statistics

- **Population** estimated as 25 million (2014)
- **Percentage of women** in population estimated as 51% (2017)
- **Literacy level** (2011)
    ◊ Whole population: 89.6%
    ◊ Women: 38.8%
    ◊ Men: 68.6%
- **Enrolment of girls in schooling** (2008-2012):
    ◊ Primary school: 87.6%
    ◊ Secondary school: 16.7%
    ◊ Tertiary school: 3.73%
- **Estimated government spending on education** 6.8% of the GDP (2010)
- **GERD** 0.34% (2015)
    ◊ Decreased since 2010 – 0.46%
- **SET/STEM enrolments at tertiary level**
    ◊ Undergraduates: Not provided
    ◊ Masters: Not provided

Relevant interventions for women and STI

- In April 2015, the World Bank approved an additional $45 million in financing for the Mozambique Higher Education Science and Technology Project.
    ◊ This builds the country's capacity in technical and vocational education.
- A mathematics Olympiad at the national level called the Creation Tomorrow Scientists.
- Establishing the Scientific Initiation programme.
    ◊ To promote research to young students.

Progress on the establishment WiSET

In Mozambique the number of females in STI is still lower than the number of males. However, women account for an increasingly larger number of students in higher education institutions. The number of women in leadership positions is also lower than the number of men.

Relevant policies

Recognising the importance of STI the government of Mozambique:

- Established the ministry responsible for the S&T sector (2000) with two reformulations; one in 2005 and the other in 2015.
- Approved the S&T Policy (2003) and Mozambique Science, Technology, Innovation Strategy (MOSTIS 2006).
- Established the National Research Fund (NRF)(2005).
- Approved the regulatory legal framework to create an environment for STI.
- Established the National Science Council (NSC)
    ◊ Advise the cabinet
- Established the Academy of Science.
- Approved the implementation of the Strategy for Human Resource Development for STI (2006).
- Is establishing an STI System (Law of S&T)

The STI policy is composed of four pillars:

- Research
- Education
- Innovation
- Diffusion

Implementation, monitoring and evaluation of this policy are through the biannual publication of STI indicators.

Contact details for gender and STI

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References

Data.worldbank.org. (n.d.). [online] Available at: https://data.worldbank.org/ [Accessed 2 Nov. 2017].

NAMIBIA

General Information

Key Statistics

- **Population** estimated as 2.5 million (2016)
- **Percentage of women** in population estimated as 51.3% (2015)
- **Literacy level**
  ◊ Whole population: 90.8% (2015)
  ◊ Women: 88% (2011)
  ◊ Men: 88.6% (2011)
- **Enrolment of girls in schooling**
  ◊ Primary school: 91% net (2013)
  ◊ Secondary school: 57.5% net (2007)
  ◊ Tertiary school: 10.4% gross (2008)
- **Estimated government spending on education** 8.35% of GDP (2010)
- **GERD** is 0.34% of GDP (2013/14)
- **SET/STEM enrolments at tertiary level**
  ◊ Undergraduates: Not provided
  ◊ Masters: Not provided

Relevant policies

- Vision2030
- NDP4
- Affirmative action
- National gender policy 2010 – 2020
  ◊ Special focus on gender but limited on STEM
- RSTI policy
- National programme on RSTI
- ICT policy

RSTI and ICT policies have no strategy focus on gender issues.

Relevant interventions for women and STI

Namibia is working on:

- Designing policies and relevant indicators focused on honouring the involvement and importance of women in STEM;
- Developing new indicators and methods to collect and analyse disaggregated data on women's participation in STEM.

Progress on the establishment of the WiSET

Percentage of the female share of total researchers was 38.7%. Percentage of the male share of total researchers was 61.3% (R&D survey, 2013/14).

Namibia has a very high proportion of women enrolment at 77% compared to the rest of the SADC countries.

There are many STEM programmes, but only a few are targeting women/girls:

- RSTI National Awards
- ICT
- Women in computing conference
- Namibia Women Hackathon
- Forum for African Women Educationalists Namibia (FAWENA)
- Education Policy, The Education Act (Act 16 of 2001)
- Girls Empowerment Clubs

Key areas and actions for further development of the WiSET

KeSTEMy area	Actions
Development of Statutes/Charter	• Develop Statutes/Charter in line with the SADIC WiSET Charter and AU Statutes
Round Robin & Consultation Meeting	• Improve Charter to add national priority areas • Incorporate the resolution of the commissioners into the Charter
Consultation Meeting	• Consultation meeting with all stakeholders to discuss and endorse Charter
Commissioners Meeting	• Approval by all Commissioners
Endorsement	• Minister to endorse the final draft
Advert for Membership	• Discuss, design and approve advert for membership
Launch of NAMWiSET Chapter	• Plan to organise launch of NAMWiSET Chapter
1st Conference	• Host Conference to elect Executive Committee and Secretariat
1st Meeting Executive Committee	• Executive Committee and Secretariat to develop Plan/Programme of Action (5-year period)

Contact details for gender and STI

Namibia University of Science and Technology Private Bag 13388 Windhoek, Namibia 13 Storch Street Windhoek, Namibia Tel +264 61 297 9111	Ministry of Education The Government Office Park (Luther Street) Private Bag 13186 Tel: +264 61 293 3358 Email: info@moe.gov.na

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SOUTH AFRICA

General Information

Key Statistics

- **Population** estimated as 54 million (2014)
- **Percentage of women** in population estimated as 51.7% (2011)
- **Literacy level (2015)**
  ◊ Whole population: 94.3%
  ◊ Women: 93.1%
  ◊ Men: 95.5%
- **Enrolment of girls in schooling**
  ◊ Primary school: 87.9% net (2005)
  ◊ Secondary school: 71.6% net (2005)
  ◊ Tertiary school: 23.3% (2014)
- **Estimated government spending on education** 6.03% of the GDP (2014)
- **GERD** is 0.72% (2013)
  ◊ A large proportion of government-funded R&D expenditure goes to the higher education sector (48.8%) while only 6.2% goes to the business sector in the form of direct and indirect R&D funding
- **SET/STEM enrolments at tertiary level**
  ◊ Undergraduates
  ◊ Masters
  ◊ Higher education institutions: 25% at majority institutions

Relevant policies

- Medium-Term Strategic Framework (MTSF): DST contributes to the outcome of a skilled and capable workforce to support an inclusive growth path for South Africa's economy.
- Human Resource Development Strategy South Africa (HRD-SA) DST contributes to the commitment and improvement of the technological and innovation capability and outcomes.
- National Research Development Strategy (NRDS 2002) – The strategy identified the problem of "frozen" SET demographics and the need for the renewal of South Africa's human resources base.
- The Ten-Year Innovation Plan (TYIP: 2008) – It aimed at making South Africa a knowledge economy and identifi ed the PhD as a driver of innovation.
- Science Engagement Strategy (2017) aimed at driving engagements between science and society.
- Human Capital Development Strategy for Research, Innovation and Scholarship (HCD for RIS) – codifies the many human capital development initiatives into a strategic framework.
- National Development Plan (NDP – by 2030): – outlines the vision for South Africa by 2030 and the kind of society South Africa wants to create by then.
- 100 PhDs per million of population, i.e. 5 000 PhDs p.a. (current 40 PhDs per.million. 2 300 PhDs per annum).
- 50% SET PhDs by 2030.
- Majority of the PhDs should be blacks and women by 2030.
- 75% of academics with PhDs (currently 43% of academics have PhDs).

University participation to increase from 950 000 in 2012 to 1 620 000 by 2030.

Relevant interventions for women and STI

Contributing to increased learners' participation in mathematics and science

- Activities like the annual National Science Week (NSW), science festivals and science centre-based science awareness exhibits, stimulate learners' interest in mathematics and science, which enhances the Department of Basic Education's (DBE) intentions to increase learners' participation in these learning areas.
- In 2014, up to 20% of about 818 000 participants in the NSW and festivals were learners, mainly in the further education and training (FET) band.
- Up to 65% of the 1.6 million visitors to science centres in 2013 were learners (general education and training (GET) and FET combined).

Science centre-based support

- In addition to pure science awareness exhibits, science centres have hands-on exhibits that are linked to curriculum concepts across grades.
- Of the 33 science centres supported by the DSI:
  ◊ 27% have fully equipped science laboratories, assisting learners from under-resourced schools with experiments;
  ◊ 42% have mobile laboratories, conducting scheduled school visits to assist with experiments;
  ◊ 12% collaborated with their provincial departments of education in the delivery of teacher in-service training in the 2013 academic year;
  ◊ up to 90% annually conduct supplementary tuition and/or preparatory exam sessions.
- Mathematics and physical science.

Progress on the establishment of the WiSET

The transformation has been achieved by the government and science councils, as the gender balance in these institutions is quite favourable compared with the business sector where white males dominate.

Contact details for gender and STI

Science and Technology Department South Africa, National Research Foundation. DST Building No 53 CSIR South Gate Entrance Meiring Naudé Road, Brummeria Private Bag X894 Pretoria South Africa Tel: +27 12 843 6300	National Advisory Council on Innovation Suite L2, Enterprise Building Mark Shuttleworth Street The Innovation Hub The NACI Secretariat Private Bag X894 Pretoria 0001 Tel: 012 844 0925 Email: naci@dst.gov.za

ZAMBIA

General Information

Key Statistics

- **Population** estimated as 16.6 million (2016)
- **Percentage of women** in population estimated as 50.4% (2016)
- **Literacy level**
  - ◊ Whole population: 83% (2010)
  - ◊ Women: 77.7% (2010)
  - ◊ Men: 88.7% (2010)
- **Enrolment of girls in schooling**
  - ◊ Primary school: 88.3% net (2013)
  - ◊ Secondary school: -
  - ◊ Tertiary school: 3.4% gross (2012)
- **Estimated government spending on education** 1.1% of GDP (2008)
- **GERD** 0.28% of GDP (2008)
- **SET or STEM enrolments at tertiary level**
  - ◊ Undergraduates: Not provided
  - ◊ Masters: Not provided

Relevant interventions for women and STI

National Policy on Science and Technology

Gender issues in science and technology are increasingly a focus of concern in Zambia. The participation of women in the area of science and technology has lagged behind that of men. Thus, a gender-sensitive science and technology policy is important if both men and women are to participate effectively in the development and implementation of science and technology programmes.

Objectives

- Ensure that gender concerns are integrated at all levels of the science and technology development process.
- Increase the number of girls who take up science and technological subjects at all levels of learning.
- Identify and eliminate factors that prevent females from progressing and excelling in science subjects.
- Review the school and college curricula on science and technology to make it gender-sensitive.
- Establish funds and scholarships to be used for awarding females for their education in the science and technical fields.
- Promote science and technology subjects in girls' schools by making the subjects compulsory.
- Establish and/or strengthen career counselling programmes to address problems which hinder girls' progression in science and technology.
- Provide incentives to female teachers in science and technology.

(Wipo.int. (1996). Zambia: National Policy on Science and Technology.)

Relevant policies

The National Gender Policy established in 2014, aimed at "ensuring the attainment of gender equality in the development process by redressing the existing gender imbalances"[3], as well as equal opportunity for men and women to benefit from national development and actively participate and contribute to it.[4]

It was the revised version of the first National Gender Policy in 2000. Since then, Zambia has made progress in empowering women and achieving gender equality in some sectors. However, the revised policy gives "a clear mandate to the Ministry of Gender and Child Development and other line ministries to mainstream gender in their operations"[5].

It also "sets priority areas of action at the national, provincial, district and community levels in terms of planning, resource allocation and implementation of development programmes to promote gender equity and equality"[6].

Other programmes by the government of the Republic of Zambia, through the Ministry of Gender:

- Gender policy formulation
- Gender mainstreaming
- Economic empowerment of women
- Prevention of gender-based violence and the multidisciplinary management of survivors
- Monitoring and evaluation
- Communication and advocacy
- Technical backstopping or institutional capacity building around gender

(Mgcd.gov.zm. (2016). Home.)

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[3] Ng'ambi, D. (2014). National Gender Policy 2014. [pdf] Ministry of Gender and Child Development Republic of Zambia. Available at: http://extwprlegs1.fao.org/docs/pdf/zam152916.pdf
[4] Ibid
[5] Ibid
[6] Ibid

Progress on the establishment of WiSET

Current data indicates women's unequal opportunities and participation in all spheres of national development. This is seen mainly due to traditional rules and practices that result in the long-lasting constraint on women's socio-economic and political empowerment and progress.

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ZIMBABWE

General Information

Key Statistics

- **Population** estimated as 13 million (2012)
- **Percentage of women** in population estimated as 51.3% (2016)
- **Literacy level**
  ◊ Whole population: 88.7% (2014)
  ◊ Women: 88.3% (2014)
  ◊ Men: 89.2% (2014)
- **Enrolment of girls in schooling**
  ◊ Primary school: 86.5% net (2013)
  ◊ Secondary school: 44.5% net (2013)
  ◊ Tertiary school: 7.98% gross (2015)
- **Estimated government spending on education:** 8.4% of the GDP (2014)
- **GERD** N/A
- **SET or STEM enrolments at tertiary level**
  ◊ Undergraduates: Not provided
  ◊ Masters: Not provided
  ◊ SET enrolments at higher education institutions: 20.87% at state universities

The Ministry of Higher and Tertiary Education, Science and Technology Development recognises the importance of STEM as a tool necessary for industrialisation and modernisation of the country as well as "home-grown development" that is less reliant on imported technologies. The ministry is finalising a policy to transform all polytechnics in the country into degree-awarding institutions. Also, polytechnics are offering "STEM-related BTech degree programmes that provide technological solutions to Zimbabwe's industrialisation and modernisation challenges" *(The Chronicle, 2017).*

Relevant interventions for women and STI

The STEM programme is being promoted through the Ministry of Higher and Tertiary Education, Science and Technology Development.

From 2016, free education is offered to all pupils in public schools who register for science subjects when they enrol for advanced levels. Female students are encouraged to select STEM programmes.

Programmes for women and STI

- Ministry of Higher Education now merged with Science and Technology Development.
- STEM Programme: Free education for all pupils in public schools at advanced levels who take up science subjects starting from 2016, where the government pays full school and boarding fees.
- STEM is being muted for expansion to tertiary institutions.
- Formation of girls science camps.
- Promotion of mathematics olympiad.
- Science exhibitions.
- Girls science competitions.
- Science essay competitions.
- Intel's international science and engineering fair.
- Technovation challenge (building mobile applications).

Relevant policies

Gender Policy 2013 – 2017 Objective

- Gender, Education and Training are to promote:
  ◊ Equal access to education for boys and girls and their retention at all levels of education.
  ◊ Access to training opportunities for men and women, to enable equal participation in the workplace, marketplace and governance structures.
- Second Science, Technology & Innovation Policy 2012.

The Second Science, Technology & Innovation Policy has six primary goals. Primary Goal 1 states that there is a need, to strengthen capacity development in STI. Policy 1.1 calls for pupils at primary and secondary school to spend at least 30% of their overall time studying science subjects.

Policy 1.2 calls for practical experiments that should explore the experiences of students, and encourage interest across gender.

The 2012 Second Science, Technology and Innovation Policy acknowledges the discipline as cross-cutting among all socio-economic sectors. The policy underscores the importance of mainstreaming science, technology and innovation in all sectors of the economy and ensures that Zimbabweans benefit from acquisition and utilisation of available technology in improving the quality of their lives.

There are opportunities for learning and utilising emergent technologies and accelerating development in areas such as biotechnology, information, communication and technology, nanotechnology, and indigenous knowledge systems.
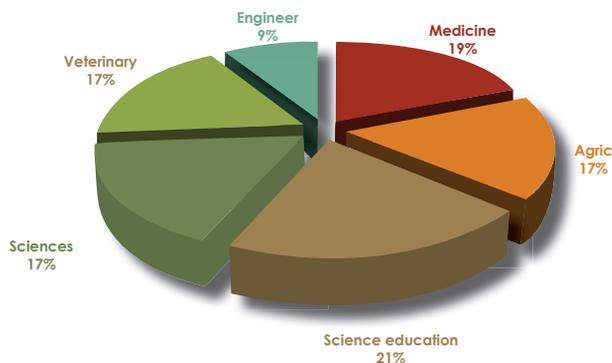
Progress on the establishment of the WiSET

In 2017, the number of female students in secondary school and at tertiary level increased compared to 2016. However, there is still a gap compared to male students. Zimbabwe has also increased the number of women research and academic staff, although still far from reaching parity with men. For example, in 2012 the headcount of women researchers in agricultural sciences was 97, 85 for engineering and technology and 208 for natural and exact sciences. Although there are significantly more male researchers, there are still a considerable number of female researchers in science fields.

Zimbabwe is still to set up its chapter, and the first proposed meeting was scheduled for June 2017. Not to say that Zimbabwe has been silent on the formulation of its chapter, but we have already started a compilation of women in STEM and a publication of women in engineering which is ready to print.

Enrolment in STEM courses

The enrolment of women in STEM courses is gradually improving, but still low. Zimbabwe has more than 30 per cent women enrolment.

The following graph indicates female enrolments by discipline in 2016:

Contact details for gender and STI

Ministry of Higher and Tertiary Education, Science and Technology Development Physical Address: New Complex Building 6th Floor, F Block, Government Offices, Cnr 3rd Street/Samora Machel Avenue, Harare, Zimbabwe Tel: +263 4 73 6862 Website: www.mhet.gov.zw	Zimbabwe Council for Higher Education 21 JM Nkomo Rd, Hatfield, Harare Tel: (+263) 571163

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