

Women and girls around the world are excluded from participation in science and technology (S&T) by poverty, lack of education and aspects of their legal, institutional, political and cultural environments. *Science, Technology and Gender: An International Report* is designed to support efforts being made worldwide to analyze, discuss and change this situation.

Based on empirical research and data, this UNESCO report incorporates substantive inputs from institutions involved in science, technology, gender studies and policy. Marking the start of an ongoing initiative, it aims to spur serious discussion and action in national and international scientific and academic communities, especially regarding the pressing needs to increase women's participation in S&T careers and enable sex-disaggregated data collection and rigorous research development, along with increasing public awareness of gender issues.

With its goal of helping educators, policy-makers and the members of the scientific community to address the underlying causes of gender disparities in S&T, both in the public and private sectors, this report represents an important contribution to the political and institutional mainstreaming of the gender dimension in S&T.

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Science, Technology and Gender

An International Report

EXECUTIVE
SUMMARY

Science, Technology and Gender: An International Report

EXECUTIVE SUMMARY



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Preface

The gender dimension of science and technology (S&T) has become an increasingly important and topical issue worldwide.

For over thirty years now, the United Nations General Assembly and the UN Economic and Social Commission have emphasized the inequalities and disparities in the educational opportunities open to women and girls, and in women's access to training and the labour market. Since the 1976–85 'United Nations Decade for Women: Equality, Development and Peace', which directed particular attention to the role of women in S&T, the call for action regarding science, technology and gender (STG) has steadily intensified. When, in 2000, gender equality became one of the eight United Nations Millennium Development Goals (MDGs), the gender dimension of S&T was pushed even further into the spotlight.

In this context, and given its mandate in science, UNESCO has a major role to play in taking up these issues and working to overcome gender disparities in access to, influence over, and use of science and technology. To do so, it is crucial that UNESCO advocates and affirms the crucial role of women and the gender dimension of science and technology throughout its programmes and activities.

The UNESCO Natural Sciences Sector prepares an analytical UNESCO Science Report every four years. In the intervening years, it will be publishing thematic reports on

key issues in science. The present *Science, Technology and Gender: An International Report* is the first of such reports, a concrete example of UNESCO's commitment to integrating gender perspectives in science and technology.

This Report has been prepared in active partnership with specialists in areas relating to science, technology and gender from numerous institutions worldwide, under the technical coordination of UNESCO's Division for Science Policy and Sustainable Development. We highly appreciate the valuable efforts and contributions of these specialists and firmly believe that the present report is a solid step towards the political and institutional mainstreaming of the gender dimension in S&T activities.

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Acknowledgements and Technical Coordination

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Hansi Devi, 23 years old, repairing a solar lantern at College
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Summary of the Report

Many women and girls around the world are excluded from participation in science and technology (S&T) activities by poverty and lack of education (at all levels), or by aspects of their legal, institutional, political and cultural environments. *Science, Technology and Gender: An International Report* is designed to support efforts being made worldwide to analyze, discuss and change this situation. It represents a solid step towards the political and institutional mainstreaming of the gender dimension in S&T activities.

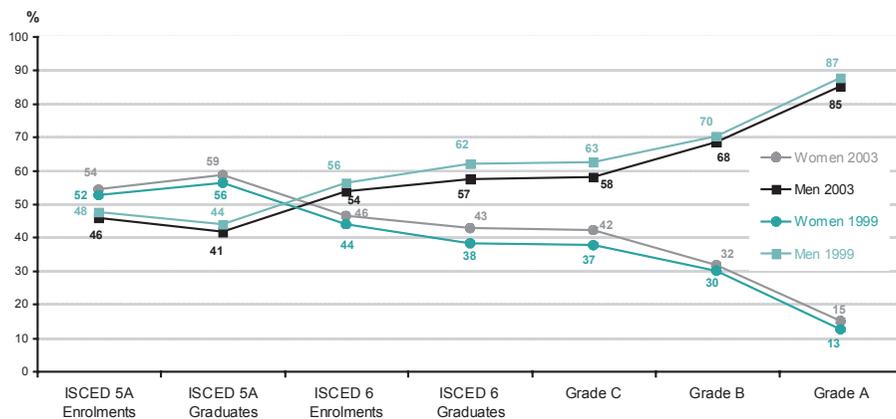
As the first publication of an ongoing initiative, this report is a dynamic document that will be constantly evolving and updated. It will provide a much-needed instrument for change to help educators, policy-makers and the scientific community address the underlying

causes of gender disparities in S&T areas, both in the public sector and in technology-based companies. A technical study based on empirical research and data, the Report incorporates substantive inputs from institutions involved in science, technology and gender studies and policy worldwide. It primarily covers the natural sciences, engineering and technology. As it evolves and benefits from updating however, future versions will hopefully cover wider fields of science and technology – notably the social sciences, medicine and agriculture.

Both a conceptual and analytical tool and a framework for action for policy-makers with regard to science, technology and gender (STG) strategies at national, regional and international levels, this report seeks to promote serious discussion of gender within national and interna-

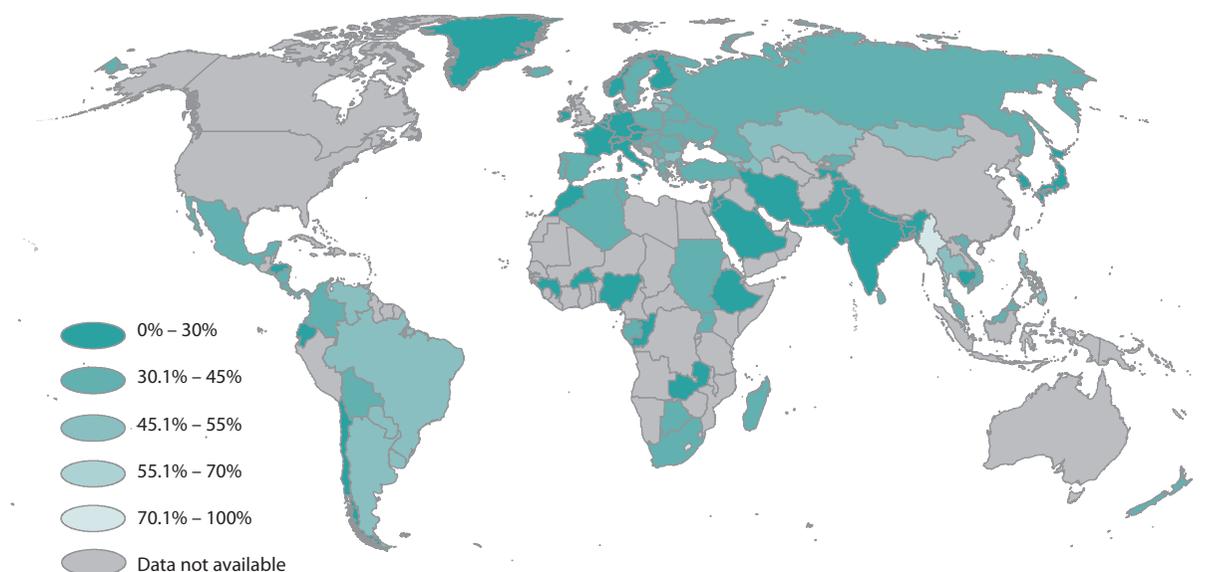
Figure 2.1: Proportions of men and women in various stages of a typical academic career

Figure 2.1a: EU-25, 1999 and 2003



Source: European Commission: Eurostat-WIS database, 2003. Countries include: Austria, Belgium, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxemburg, Malta, the Netherlands, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden and the United Kingdom.

Figure 4.1: Women as a share of the total number of researchers (headcount), 2005



Source: UIS, March 2007.

tional scientific and academic communities. It highlights the pressing need to enhance STG-related actions by: 1) increasing women's participation in S&T and R&D careers worldwide, 2) building public awareness surrounding STG-related issues, and 3) increasing STG data collection and promoting rigorous research on STG issues.

Follow-up to the report

Major actors at the forefront of science, technology and gender equity

Attaining STG equity depends on the cooperation and collaboration of major social actors on a global scale. Fourteen major social actors have actively participated in the debate on, fundraising and dissemination for, implementation, monitoring and evaluation of the key issues and policy recommendations of this report:

1. National, regional and local governments (ministries/national councils of science and technology / R&D, ministries of education, of labour).
2. Parliaments.
3. STG Coordinating networks, committees, and gender national bodies.
4. Higher education institutions and faculties of science and engineering.
5. R&D centres.
6. Scientific associations, societies and academies.
7. United Nations agencies.
8. International and regional inter-governmental organizations.
9. International, regional and sub-regional development banks.
10. Multilateral and bilateral development-assistance organizations.

11. Non-governmental organizations (NGOs).
12. Foundations.
13. Major companies, private and public.
14. The media.

Future research and monitoring needs in science, technology and gender

A suitable framework has yet to be developed that takes account of the most urgent future research areas needed in STG. These include identifying the missing links, data gaps, key issues and critical shortcomings to be addressed: career entry and exit points, the effects of short absences on a career, different types of leave and their impacts on career structures (long service leave is of a similar span to maternity leave, yet it has no negative connotations, whereas strident objections to maternity leave still exist), redesign of workplace (childcare on premises), etc.

Report dissemination and debate at regional and national levels

By its very nature, this report is a work in progress; we envision it as constantly evolving, based on the periodical updating and the collective input of specialists from science, technology and gender-related institutions worldwide. The translation, publication and dissemination of this report in the six UN official languages (Arabic, Chinese, English, French, Russian and Spanish) is of particular importance. The six-language Internet version of the report will be periodically updated.

Training at regional and national levels

Regional and national forums need to be organized to present, debate, disseminate and follow-up on the report. Regional forums could be organized in: Latin America and the Caribbean, Africa, the Arab Region, Central Asia, South-East Asia, India, China, Oceania, North America, Eastern Europe and Western Europe.

The need for fund-raising

Fund-raising is vital in order to support:

- dissemination and debate at regional and national levels
- training at regional and national levels
- implementation of research projects and new studies
- implementation of policy recommendations (through the agendas for major actors).

Overview

Advances in science and technology (S&T) continually impact our everyday living and have a great potential to improve the lives and livelihoods of people in developing and developed countries. With over 1 billion people living in poverty, most of them being women and children the role of S&T has become vital to the amelioration of the quality of life and the socioeconomic and environmental situation of any country. Increasing women's involvement, input and access to S&T is essential to reducing poverty, creating job opportunities and increasing agricultural and industrial productivity. S&T can provide clean and renewable energy sources, and can improve health and education and predict and manage the effects of climate change and biodiversity.

Chapter 1. S&T Policy and Gender

Women represent a significant portion of any nation's human resource base, a pool of talent for science, technology and innovation. However most often women are left un- or under-represented in S&T policy. How best to bring more women into the science and technology workforce? By further strengthening and incorporating strategies, policies, programmes and indicators that focus on increasing women's participation (a gender perspective) into the science research agenda on international, national and regional levels.

Chapter 2. Gender and S&T Education

The significance of education in supporting sustainable human development and enhanced quality of life is undisputed. It is also undisputed that in most regions of the world, women are more likely than men to be uneducated or undereducated, especially in regard to science and technology. Despite improvements in education enrolments and increasing numbers of both girls and boys in primary and secondary school, gender disparities (for both sexes) remain the rule worldwide, and present trends are insufficient to meet the Millenium Development Goals. However, at the tertiary level enrolment of women has increased steadily and women are now approaching the 50 percent of the total number of tertiary students worldwide.

Chapter 3. Employment and Careers in Science and Technology

While many women enjoy successful and rewarding careers in various areas of S&T, much more progress needs to be made. Girls are less likely to obtain the education needed to take up an S&T career, women in the field are often paid less than equally-qualified men, and are less likely to be promoted, and women are consistently clustered at the

lower ranking levels of the science system. There is no single obstacle that leads women in S&T being few in number and overwhelmingly concentrated at the lower levels. Retaining them would mean providing them with more options, access and trajectories, giving them the opportunity to develop their career with equal pay and by offering less rigid working arrangements (work-life balance).

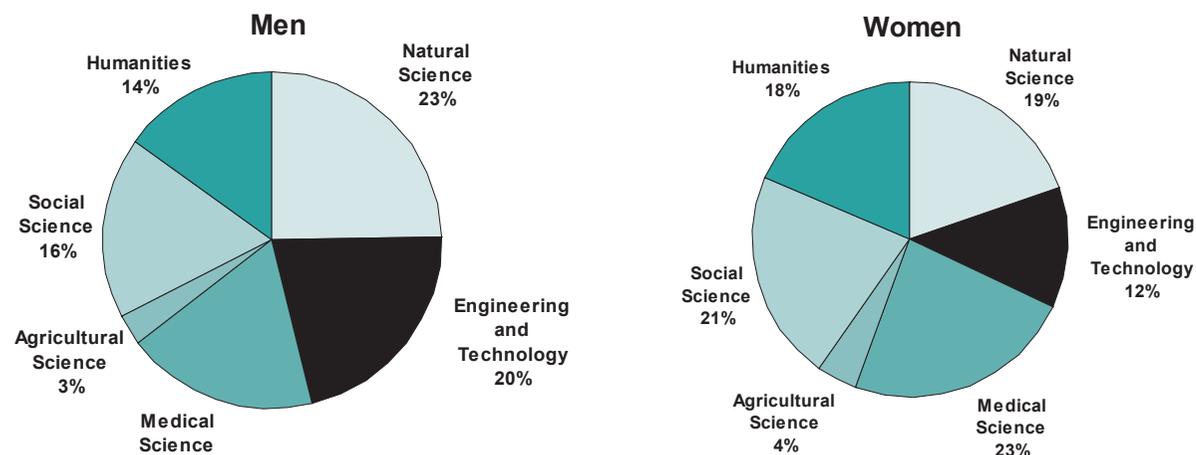
Chapter 4. Women in Scientific and Technological Research

There remains an absence of researchers and women scientist in top managerial positions throughout the world. There are a wide range of factors that may explain the lower number of women in senior research and development, including work-life balance, gendered patterns and approaches to productivity, and performance measurement and promotion criteria. What do we really know about the kind of science that women do? Or the kinds of research undertaken by them?

Chapter 5. Information on S&T and Gender: Data, Statistics and Indicators

If the development of science and technology continues to maintain the growth rate of the last 50 years, it will be necessary to significantly increase the numbers of people, both men and women, dedicated to research. Gender statistics is a relatively new field that cuts across all traditional statistical fields: it describes social progress from the perspective of gender equality. The demand for relevant, reliable statistics among policy-makers and the international community has increased tremendously in recent years however there is still a lack of significant official data on science, technology and gender (STG). It is therefore a priority for the international community to assist countries to improve their capacities, data collection and, in turn, STG indicators.

Figure 4.2: Distribution of researchers in the EU by main scientific fields and sex, higher education sector, 2003, by headcount



Source: EU, DG Research.

Figure 5.2: Research funding success rate differences¹ between women and men, 2004

Source: WiS database DG Research.
 Exceptions to the reference year: AT, SE: 1999; IL: 2000; EL, LU, NL, LT: 2002; IE, IT: 2003
 Data unavailable: ES, FR, MT, BG, RO, TR.
 BE: Flemish community only.
 Data are not necessarily comparable between countries due to differences in coverage and definitions.
¹Success rate men minus success rate for women.

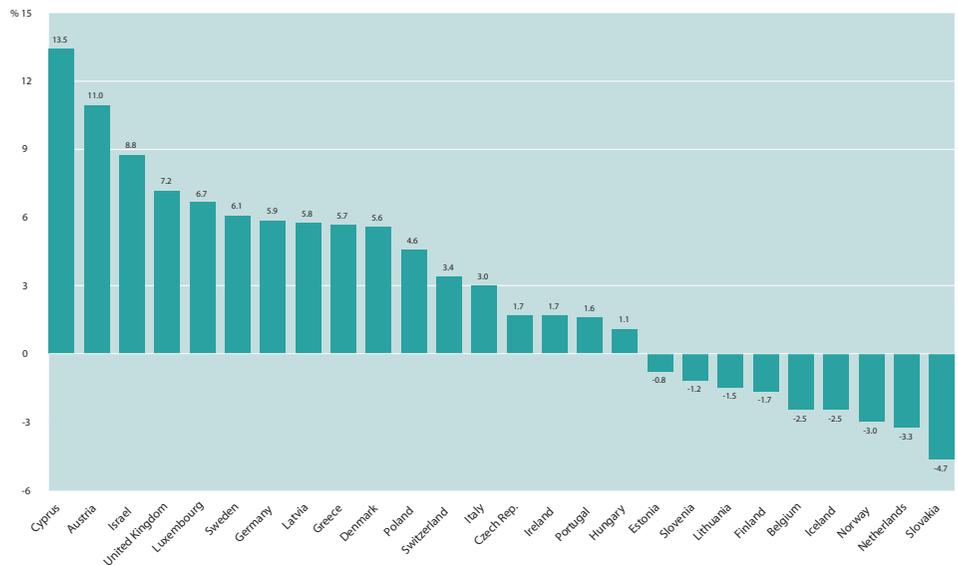


Figure 5.3: Proportion of women on scientific boards, 2004

Source: WiS database DG Research.
 Exceptions to the reference year: FR, PL, SE: 2002; BG, IT, LV: 2003.
 Data unavailable: AT, EL, ES, LU, MT, PT, RO, TR, IL.
 BE: French community only.
 Data are not necessarily comparable between countries due to differences in coverage and definitions.

