... an essential

element in our

scientific endeavour

"You cannot hope to build a better world without improving the individuals. To that end, each of us must work for our own improvement and at the same time, share a general responsibility for all humanity, our particular duty being to aid those to whom we think we can be most useful."

[Marie Curie]

One in a million

Marie Sklodowska Curie was the first woman to receive a Nobel Prize in 1903 and the only woman to be awarded two Nobel prizes in the categories of Physics and Chemistry. Her first Nobel prize – which she shared with her husband Pierre Curie and French physicist, Antoine Henri Bacquerel – was in the field of Physics, for her work on radioactivity and the discovery of two highly radioactive elements, radium and polonium. Marie was awarded her second Nobel prize in Chemistry in 1911, for her work in isolating radium and studying its chemical properties. Marie's inspirational achievements and egalitarian approach made her a shining example of how women have a unique contribution to make towards scientific progress.

Marie Curie

Contents

Foreword by Chairperson

"This inequality within the SET sector has made it necessary to prioritise positive interventions, especially as gender equality is a fundamental tenet under the Bill of Rights of The Constitution of the Republic of South Africa."

Luci Abrahams

[Chairperson of SARG]

The introduction of the National Research and Development (R&D) Strategy in 2002 represented a turning point in South Africa's approach to the role of women in Science, Engineering and Technology (SET). In the R&D Strategy the government points to the under-representation of women within the SET workforce. This is exacerbated by the lack of access that women – especially from marginalised and rural areas – have to the benefits of SET.

The picture gets gloomier, with some disconcerting statistics that indicate that the number of scientific publications produced by women in South Africa

has increased only marginally from 16% in 1990 to 19% in 2001. Women account for 52% of our population but are not proportionately represented in academia or industry. This shows how we are ignoring this valuable national resource.

This inequality within the SET sector has made it necessary to prioritise positive interventions, especially as gender equality is a fundamental tenet under the Bill of Rights of The Constitution of the Republic of South Africa.

However, creating gender equality within SET is much more than a politically correct process. Rather, it is intrinsic to the achievement of the national goals of economic growth, job creation and social upliftment. In order to meet these goals we have to increase the pool of potential researchers, both women and men, to ensure that we reverse the trend of the ageing research community in our country.

Additionally, it is globally accepted that a highly skilled population – those people involved in scientific knowledge production, technological development and innovation – is needed to transform a nation into a "knowledge society" and drive its global economic competitiveness.

Women also bring a different perspective to SET as a result of the different role that they have within society. This perspective could breathe new life into research both in the way that it is conducted and in the innovations that emerge. Echoing this point, the "Beijing+5" Report declared that a fundamental and necessary component of development is to ensure that equal opportunity is afforded to women to access science and technology.

The government believes that making science and technology more accessible to women, will result in:

- the transfer of patterns of productivity,
- job creation and new ways of working, and
- the establishment of a knowledge-based society resulting in wealth creation and a better quality of life for women and their households.

It is, therefore, with great pleasure that I introduce the South African Reference Group on Women in Science and Technology (SARG), which has been established in response to the aims outlined in the R&D Strategy. SARG was proposed as a group of local and international stakeholders and representatives of organisations with an interest in the progress of women in science, who will advise the Minister of Science and Technology on relevant issues. The group was established in March 2003 as a sub-committee of the National Advisory Council on Innovation (NACI).

We urge all stakeholders within SET institutions and the higher education institutions to give the group their full support. The process of transforming and sensitising the SET sector will demand a unique and passionate approach. Both qualities are represented in this review.

Luci Abrahams

Chairperson of the South African Reference Group on Women in Science and Technology

Overview

Worldwide acknowledgement that women have a significant contribution to make towards achieving national goals of economic growth, job creation and social upliftment, signals a long-awaited enlightenment. However, this is only the first step in the journey.

The first year of operation of the South African Reference Group on Women in Science and Technology (SARG) has been both invigorating and daunting. Invigorating because of the opportunity to apply our collective minds (within the group and through a still limited number of interactions) to the challenges of women in science. And it has been daunting because the desire to build a platform for South African women, both young and old, in the emerging scientific universe, will require clarity of purpose and selfless dedication from all those associated with this project and with the National System of Innovation (NSI) over many years.Thanks to the tireless efforts of the former Deputy Minister of Arts, Culture, Science and Technology, Buyelwa Sonjica, her predecessor, Bridget Mabandla, and the contributions of each member, the group has built a solid foundation from which to rise to the many challenges.

South Africa is not alone in addressing the issue of creating structures within society that enhance the contribution of women in Science, Engineering and Technology (SET). Gender mainstreaming presents a major challenge for most other countries and SARG has therefore developed relationships with similar groups in India, the European Union (EU) and the United States of America (USA) in order to share ideas on how best to formulate solutions.

SARG Strategy

The main objective of SARG is to make recommendations to public policy-makers to promote gender mainstreaming in the related spheres of SET and Innovation. This involves building an understanding and recognising the value of the varying and equally potent contributions that women and men can make to society in the SET sphere, in particular to building a stronger and more competitive NSI.

SARG aims to do this by:

- raising a gender equality perspective in everyday policy-making in relation to the NSI;
- contributing specific, research-based recommendations in order to promote a greatly enhanced role for women's contributions to innovation in SET; and
- encouraging both men and women, through relevant policy instruments and strategy design, to place a concerted focus on gender in the NSI research agendas.

The status of women in science

To effectively tackle the task of introducing gender mainstreaming into the NSI, it was first necessary to identify the fundamental barriers to women's participation in SET, as well as to uncover the potential benefits of science for women.

In January 2003, a study entitled *Facing the facts: Women's participation in Science, Engineering and Technology in South Africa* was commissioned.

The aims of this research were twofold:

- to develop a gender-disaggregated profile of the human resources for SET in the public science system in South Africa, in order to establish the status of women in science; and
- to explore the nature and extent of the contribution research has made towards understanding the specific needs and problems of women in general, namely the potential benefits of science for women.

The main findings of the research indicate that women in South Africa have made great strides in the past decade in terms of their participation as Postgraduate students and professionals working in SET. Although still clearly disadvantaged in relation to their White counterparts, African, Asian and Coloured women are beginning to make their presence felt on the SET stage.

Despite these positive trends, women in SET are usually:

- younger and less qualified than men;
- receiving a significantly smaller slice of the research inputs, rewards and recognition on offer; and
- clustered in certain scientific domains (disciplinary areas such as nursing and occupational therapy, which for too long have been considered women's domains).

The full study, called *Facing the facts: Women's Participation in Science, Engineering and Technology in South Africa* has now been published and made available at www.sarg.org.za.

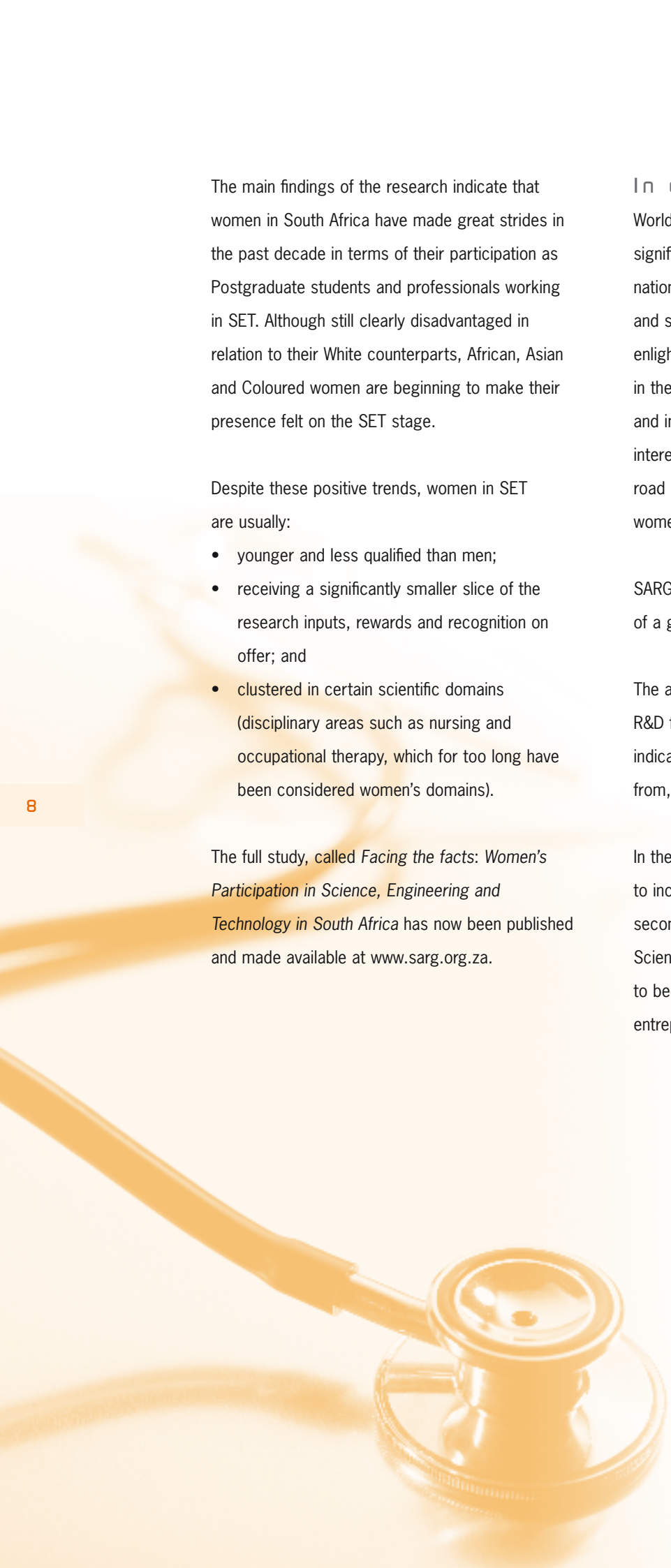
In conclusion

Worldwide acknowledgement that women have a significant contribution to make towards achieving national goals of economic growth, job creation and social upliftment, signals a long-awaited enlightenment. However, this is only the first step in the journey. Further work, including research and interaction with a broad cross-section of interested parties, is required to clearly define the road map for the next decade of South African women in science.

SARG is currently contributing to the development of a gender policy for the NSI.

The aim is to include good practice guidelines for R&D funding, as well as to identify key performance indicators for women's participation in, and benefit from, the NSI.

In the longer term, the focus is on finding ways to incentivise girls currently at primary and secondary school levels, to enter careers in Science, Technology, Engineering and Mathematics, to become innovators, inventors and science entrepreneurs.



Constitution of SARG

TERMS OF REFERENCE

Gender mainstreaming – bringing gender considerations to the forefront of our daily lives – is the principal strategy of SARG. The group aims to advise government on measures to achieve greater equality between women and men by bringing a gender equality perspective into everyday policy-making, and by complementing the more traditional approaches of promoting gender equality, such as legislation and positive action.

In particular, SARG will encourage South Africa's scientific community to address gender equality in a holistic manner, which makes it possible for us to acknowledge and accept equally, the differences between women and men and the diverse roles they play within society.

The terms of reference of SARG have been defined as:

- To collaborate with the NACI in promoting engendered research agendas. This includes allocating funding to scientific research that will improve the quality of life of women.
- To collaborate with NACI in promoting a NSI that will enable women to make a greater contribution to wealth generation in South Africa.
- To advise the Minister of Science and Technology on developing mechanisms that will increase the participation and contribution of women in SET.
- To publicly endorse women role models who, as a result of their achievements, promote women's entry to, and advancement in, the SET sector.
- To play a monitoring role in tracking whether institutions that have implemented gender mainstreaming policies are achieving the desired results across the NSI.

Evolutionary thinking

Nomakwezi Mzilikazi is Africa's first black evolutionary physiologist. Nomakwezi, who hails from Idutywa in the Eastern Cape, was the recipient of the African Woman Scientist Fellowship, an award of the South African Department of Science and Technology. Based at the Zoology Department of the University of Natal in Pietermaritzburg, Nomakwezi is regarded as an expert on the behaviour of small animals such as the elephant shrew and bushbabies. The DST has great hopes that Nomakwezi is on her way to becoming an A-rated scientist. She plans on using some of her fellowship money to carry out post-doctoral research overseas and to continue the work she started during her PhD to include more species.

Nomakwezi Mzilikazi

ACCOUNTABILITY AND GOVERNANCE

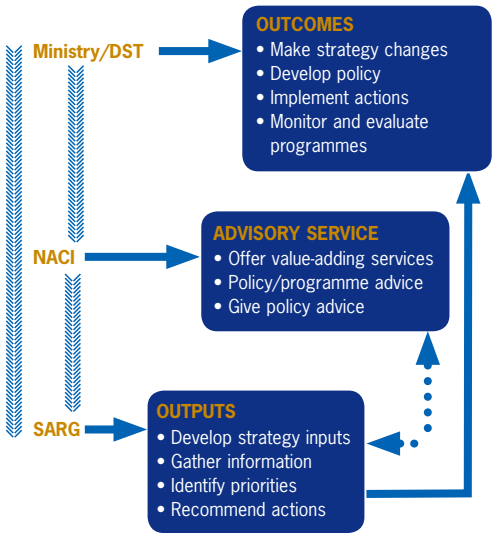
In order for SARG to have a meaningful impact on Science and Technology policy in South Africa, the group has been convened as a sub-committee of NACI.

Chairperson of SARG, Luci Abrahams, is a member of NACI and provides regular updates at NACI meetings about the group's activities and *vice versa*.

To ensure close departmental involvement in implementing strategies developed by SARG, the Manager of Science and Gender from the DST is an ex-officio member of the group.

The Office on the Status of Women (OSW) and the Commission on Gender Equality (CGE) enjoy an open invitation to all SARG meetings as observers, to enable them to perform their constitutional mandate of monitoring gender activities in South Africa.

The organisational relationship between, SARG, NACI and the DST



MEMBERSHIP

SARG is privileged to have eminent local and international leaders in scientific endeavours serving its interests. The group was selected according to best practice principles, based on the individuals' collective experience, expertise and commitment. Each has unique input into gender issues; all are committed to facilitating participation by women in science, technology and, ultimately, the economy.

International members

The international group consists of five experts in the field of gender equity mainstreaming. They are all from prominent international organisations.

South African members

The South African members consist of prominent South African women and men who have a contribution to make towards improving the quality of life of women through science and technology. This group consists of scientists and researchers (60%), business people working in technology-intensive industries (20%) and gender specialists (20%).

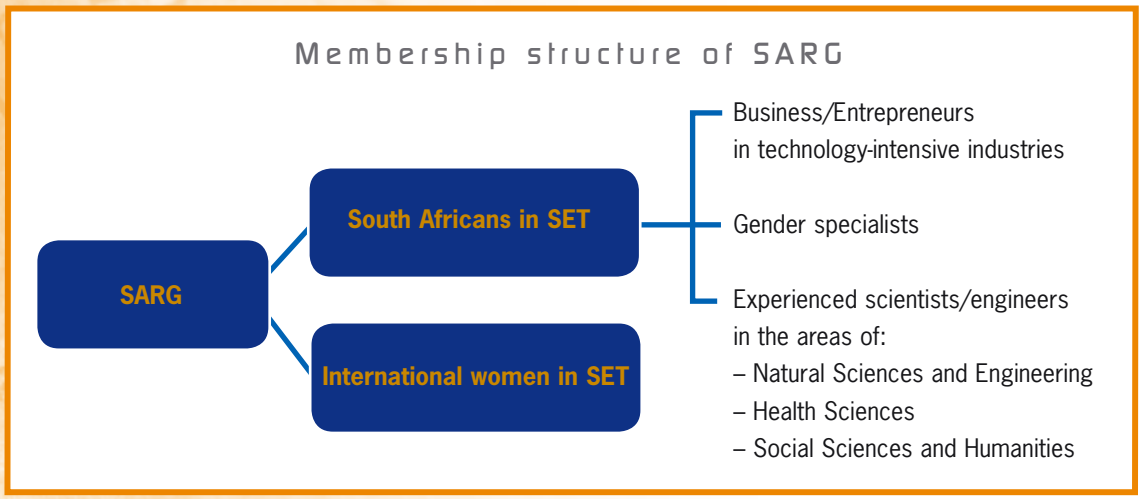
The scientists are from academic institutions, science councils and other public/private institutions. They represent the broad science categories of Natural Sciences and Engineering, Health Sciences, and Social Sciences and Humanities. The women in technology-intensive industries are high achievers within their business communities and thus serve as role models. The gender specialists are respected academics and activists who have credibility both within the civic and science communities. They are experienced in identifying women's needs, fears and frustrations in terms of the challenges they face in the workplace.

Representation

An appropriate race balance has been achieved with Blacks accounting for 63% of the group of which two thirds are African.

The male to female ratio of SARG remains disproportionate to ensure that the serious concerns of women are adequately voiced and necessary corrective measures introduced.

Members serve a three-year period and do not represent the institutions at which they are currently employed.



Progress and achievements

SARG'S MAIN OBJECTIVES

SARG has identified the following main objectives:

- To help the SET sector to establish engendered research agendas that improve the quality of life of women and enable women to be involved in wealth creation;
- To assist the SET sector in developing an engendered human resource development plan; and
- To monitor and evaluate the progress of all research and development institutions in achieving the above objectives, by determining gender-specific key performance indicators.

Devoted protagonist

Dorothy Crowfoot Hodgkin, was the third woman to be awarded a Nobel Prize in Physics in 1964 for her solution of Vitamin B-12 using the science of protein crystallography which she founded. Dorothy's other contributions to crystallography included solutions of the structures of, among others, penicillin, cholesterol and insulin (a solution which she worked on for 34 years). She also developed methods for indexing and processing X-ray intensities. Dorothy also committed a lot of her time to contributing to science policy and international relations, as well as doing a lot of work in the public arena in aid of World peace. She is remembered by her colleague Max Perutz (Nobelist for his solution of haemoglobin molecules) as "a great chemist, a saintly, gentle and tolerant lover of people, and a devoted protagonist of peace".

Dorothy Hodgkin

IDENTIFYING KEY ISSUES

The key issues of quality of life for women, women contributing to wealth creation, and gender mainstreaming must be addressed in a holistic manner in order to achieve a sustained and balanced effect on women and men in South African society.

However, gender is often ignored in research planning and strategies. For example, clinical trials for new drugs are usually performed on male subjects only, yet the resultant products are marketed for use by both men and women without full scientific knowledge of their effects on women. Engendered research planning involves deliberately incorporating the issues and challenges which are relevant to women and informed by their needs, into all research. SET institutions currently face the challenge to develop clear and auditable engendered research planning capacity.

Achieving equality for women

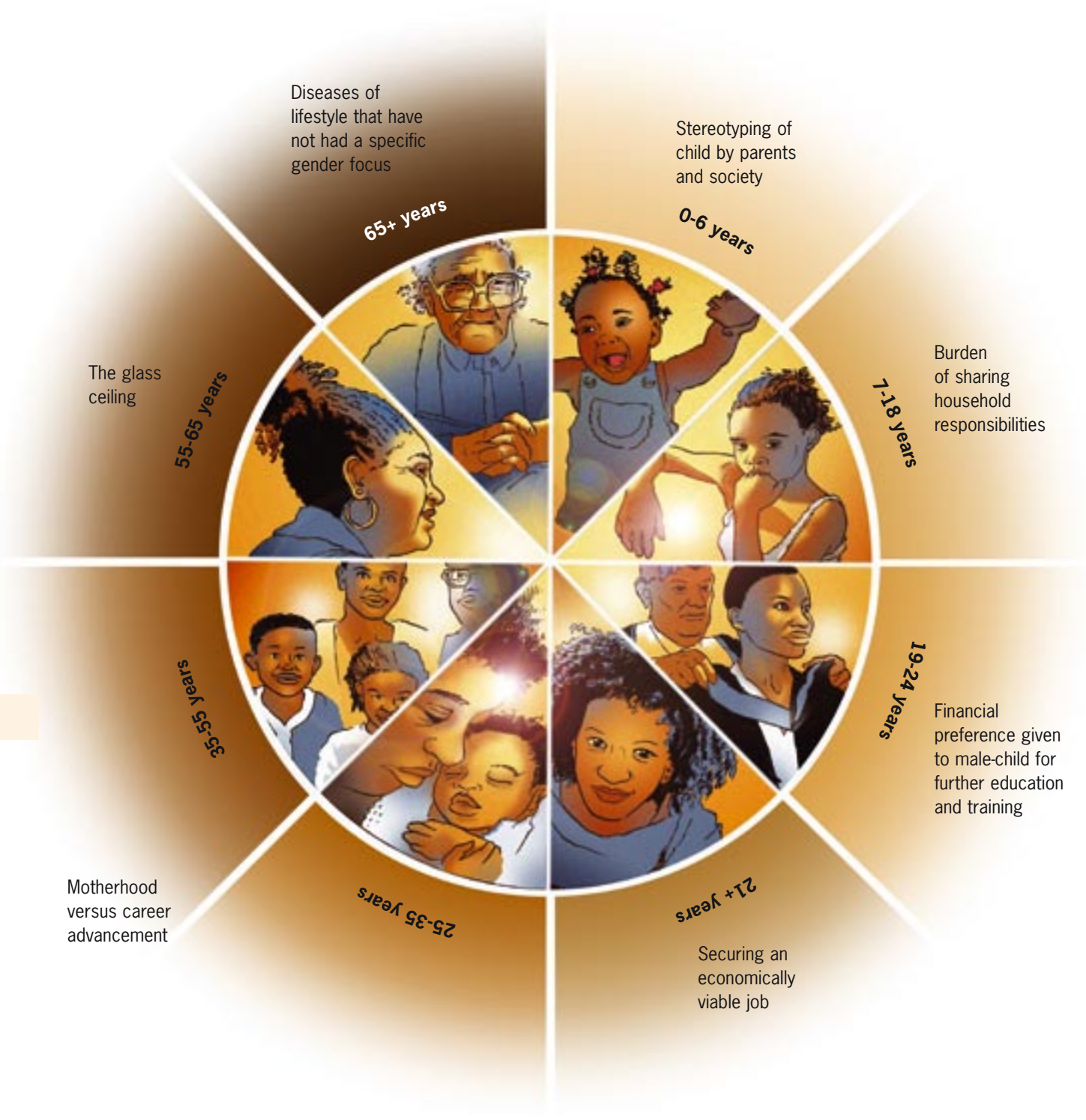
By definition, achieving gender equality for a woman involves realising equitable conditions for women and men to reach their full potential. It also involves making it possible for women to contribute in a meaningful way towards research and development and, by the same token, ensuring that they benefit equally from the results.

Reaching for equality within a woman's lifecycle

Engendered research should relate to all aspects of a woman's life and not be confined to adult life or to a woman's reproductive role only. The concept that has gained international currency is one of looking at gender issues across the span of a woman's life in the context of research agendas and human capital development. The advice provided by SARG will address issues at the following stages of a woman's lifecycle in relation to SET:

- Infant and childhood:
  0-6 years – Birth to pre-school
  7-18 years – Primary and Secondary school
- Higher education and career-pathing:
  19-24 years – Tertiary education
  21 years+ – Career path
- Parenthood/economically active period:
  25-35 years – Early career stage and young mother
  35-55 years – Mid-career stage and mature mother
  55-65 years – Potentially most active/productive working period
- Old age and frail care:
  65+ – Old age

The lifecycle model overleaf, provides a basis from which to systematically identify and remove the underlying causes of gender discrimination.



The challenges women face during their lifecycle

Areas of gender discrimination that need to be addressed

- In many cultures giving birth to a boy still carries more status than having a girl. Parents from these cultures tend to gender stereotype their children from birth.
- Parents who come from a background where women fulfil all the traditional roles of home-maker and mother, tend to impose their belief systems on their children by example.
- In terms of education, girls tend to be encouraged to choose traditionally accepted careers such as secretary, nurse, educator and so forth. Additionally, the stimulation of boys and girls has different societal caps, where boys are expected to achieve more in terms of their careers than girls, who are expected to be more family oriented.
- Recent research has shown that while a high percentage of South African women (58% of undergraduates) are entering university, only a small number of these women pursue their studies at a postgraduate level. This imbalance is even more pronounced in the spheres of SET.
- Women who do enter into postgraduate studies and research, report a sense of loneliness and lack of mentorship from their male counterparts. They also experience greater difficulty in securing funding for their research than do men.
- Women lose out on a crucial time in their career if they choose to take time off to have children. Missing out on a few months in areas of science which are changing rapidly, makes it almost impossible for a woman to re-enter that field at the same level as before she took maternity leave.
- There is a certain amount of stigma attached to being a working mother, especially if the work involves travelling or unusual hours.
- Women feel guilty about leaving their children to pursue their career due to societal pressures and expectations.
- To a large degree, men still believe that child-rearing is women's work and tend to expect their partner to fulfil these responsibilities, even if the women have full-time jobs. This leaves working women with little or no spare time to spend on working their way to the top of their field.
- A lack of gender mainstreaming in the field of research often results in the medical conditions of men taking precedence over the medical conditions from which women suffer, or of being treated in a generic non-engendered manner.

The socio-economic constraints of women tend to be more pronounced as women are, for the most part, expected to care for children and manage a household, often without any financial or moral support from the adult male figure in the household.

In old age, women from poor communities are often left to care for grandchildren, while the parents of these children go out to work. Little or no research has been done into improving the living conditions of older women who find themselves in this difficult socio-economic position.

Raising awareness

A major aim of SARG is to open the communication channels, facilitate discussions and create a general understanding and awareness of the importance of gender mainstreaming, both within the science community and to the general public as a whole. In an initial effort to address this need, SARG has created a comprehensive website and initiated an email discussion forum about the issues facing women in science. The website is used as a means to communicate the progress being made by the group

and to advertise activities which may be of interest to women in science and others involved with gender mainstreaming activities.

The group is also working on establishing a comprehensive database of South African women scientists who are role models and potential mentors. The database will provide case studies and profiles of women scientists.

There is also a dire need to increase awareness of gender issues in our NSI. This requires focussed communication and marketing initiatives which:

- inform the scientific community about the benefits of gender mainstreaming; and
- challenge the general public's perceptions about the role of women in society and the contribution they have to make to nation-building.

Promoting gender-sensitive research agendas

Research in South Africa is not gender-sensitive or gender-aware. This is because the science community has, until now, been given little or no guidance in terms of gender-aware research priorities. Added to this is a lack of socially responsive criteria guiding the approval of research proposals and research funding, which inhibits the development of engendered research agendas.

Therefore, the primary objectives of SARG with regard to engendered research agendas, are to:

- assist NACI to promote science-based research that informs and facilitates social transformation at the individual, household, community and national level and, in so doing, allow individuals to reach their full potential as members of society; and
- facilitate the redress of social and cultural imbalances

Mapping our origins

Himladevi Soodyall heads up the Population and Evolutionary Genetics Laboratory in the Department of Human Genetics at the South African Institute for Medical Research (SAIMR) at the University of the Witwatersrand. Her research has shown that living Khoisan populations have retained some of the ancestral DNA signatures found in modern humans, making southern Africa the most likely geographic region for the origin of our species. Her contribution to understanding the origin of humans by means of genetics has been acknowledged nationally and internationally. She has received numerous awards including the President's Award (2000-2004) from the National Research Foundation.

Himladevi Soodyall

between men and women in the scientific research arena with regard to gender sensitivity and the impact of research on the lives of women.

In 2004/2005, the group will commission specialists to develop gender-sensitive criteria which can assist in evaluating research projects that are publicly funded.

Developing an engendered human resource development plan

Research published in *Facing the facts: Women's participation in Science, Engineering and Technology in South Africa*, a joint project of SARG and the DST, showed that besides women being under-represented in the SET sector, they also tend to:

- be younger and less qualified than men;
- receive a significantly smaller slice of the rewards and recognition on offer; and
- be clustered in certain scientific fields, which are traditionally accepted as women's domains.

There is a high number of women enrolling (53%) in the science sector and graduating as undergraduates (58%). However, this picture turns bleak at Postgraduate level and higher:

- Black female students, especially at doctoral level, are a minority at 35% of female doctoral enrolments. Additionally, the research showed that less than one third of female instruction staff and female R&D personnel with Doctoral degrees in the SET workforce were Black.
- Whilst female students are in the majority at the undergraduate and Honours levels, they are in the minority at the Masters and Doctoral levels (39%).
- Women tend to be clustered in the Health Sciences and Social Sciences & Humanities, but are under-represented in Natural Sciences and Engineering. In 2001, for example, 47% of doctoral enrolments in Health Sciences were by women, compared to only 7% in Engineering. In addition, most of the female students in Health Sciences are clustered in fields such as nursing and occupational therapy, as opposed to medicine or surgery.
- The research showed that there are still fewer women in senior ranks within the higher education sector. Within the university sector, only 7% of the female instruction staff were professors, compared to 26% of the male staff.
- Despite growth in the numbers of female staff in higher education institutions and government SETIs, less than one-third (29%) of the women in the study were actively publishing scientists. The research showed that female scientists have only authored 19% of scientific articles in South Africa.
- In the 1990s, the National Research Foundation introduced six rating categories for scientists. The study revealed that, in 2002, the vast majority of rated scientists in Natural Sciences and Engineering were men. Across the board, women were under-represented in all the categories, but especially in category A (5%) and category B (9%).
- The research also analysed a database of more than 17 000 research projects in the public sector, to assess the extent to which this research has a gender perspective. Only 6,4% of the research projects were identified as having a gender perspective.

The research concluded that women are not adequately integrated into the science system and recommended that further research be undertaken to investigate the barriers women in South Africa face in relation to their progression within the SET system, in particular, within the Natural Sciences and Engineering sectors.

A recommendation was made by SARG to the Minister, to establish incentive awards and was

subsequently implemented by DST. This resulted in the first South African Women in Science Awards being held in September 2003. These awards included the inaugural Francis Ames Lecture on 17 March 2004, as a role-modelling concept.

Following on the success of the awards, certain interventions, which make use of the lifecycle approach, were recommended to the Minister and implemented by the DST. These include:

- a human capital development workshop with science councils to identify key performance indicators with regard to best practice and policies to increase the profile of women researchers at these institutions; and
- the need to incorporate a gender-sensitive approach in the design of the NRF Centres of Excellence.

To underscore this holistic approach, SARG is also committed to gaining a better understanding of the HEIs, in order to recommend co-operation strategies that address the needs of women in science and technology across the NSI. This would include exploring what bursaries and grants are available at the HEIs and how many women benefit from these. This project is being undertaken in conjunction with NACI.

Naturally, the feeder stream into SET is a vital component and SARG is currently establishing mechanisms to promote science and technology among girls of school-going age by encouraging women scientists to take part in road shows as role models.

Monitoring and evaluation

SARG recommended to the Minister that the various science councils determine gender-specific key performance indicators, in order to develop benchmarks for the sector.

Motivational thinker

Professor Tebello Nyokong heads up the Physical-Inorganic Chemistry Department at Rhodes University. Her main research drive is photodynamic therapy of cancer. This is a relatively new approach to cancer diagnosis and treatment, using a combination of oxygen, laser light and a photosensitiser. Professor Nyokong comes from a poor background, but refused to be overwhelmed by hardship and, with the encouragement of her parents and teachers, managed to complete her PhD in Chemistry. According to Professor Nyokong, being a woman researcher is a lonely business. However, she hopes to use the experience she has gained by working in this field to motivate other women to gain skills that will help South Africa become a front-runner in scientific development.

Tebello Nyokong

IMPORTANT TERMINOLOGY

Gender

"Gender" refers to specific social roles allocated to women and men in particular societies and at particular times. Such roles, and the differences between them, are conditioned by a variety of political, economic, ideological and cultural factors and are characterised in most societies by unequal power relations. Gender is distinguished from sex, which is biologically determined.

Gender equality

This refers to a situation where women and men:

- have equal conditions for realising their full human rights and potential;
- are able to contribute equally to national political, economic, social and cultural development; and
- benefit equally from the results.

Gender equality demands that the underlying causes of discrimination are systematically identified and removed in order to give women and men equal opportunities.

Gender equity

This term is used to illustrate fair and just distribution of all means of opportunity and resources between women and men.

Gender mainstreaming

This concept demands that one takes account of gender equality concerns in all policy, programme, administrative and financial activities, and in organisational procedures, thereby contributing to a profound organisational transformation. Bringing the outcome of socio-economic and policy analysis into all decision-making processes of the organisation, and tracking the outcome, is of specific importance. This includes both the core policy decisions of the organisation and the small everyday decisions of implementation.

Gender sensitivity

Gender sensitivity refers to perceptiveness and responsiveness concerning differences in gender roles, responsibilities, challenges and opportunities.

SARG Members

Luci Abrahams (Ms)
Chairperson

Ms Abrahams is Director of the LINK Centre at the WITS Graduate School of Public and Development Management. She is promoting the Centre as a leading research agency with a programme of policy-oriented research, active community engagement and teaching in South Africa, Africa and internationally. Her research focus areas include ICT policy and economic sectors and institutions in the emerging knowledge economy. As a member of the National Advisory Committee on Innovation (NACI), Abrahams has contributed to recommendations on science, technology and innovation matters to the Minister of Science and Technology. She is also convenor of the working group for the study: *Mobility of R&D workers*. She holds a postgraduate diploma in Public & Development Management from the University of the Witwatersrand.

Shaidah Asmall (Dr)

Doctor Asmall is Director of the Science, Gender and Disability Unit at the Department of Science and Technology. She was responsible for the establishment of the South African Reference Group as part of the wider strategy to promote gender equity within the Science, Engineering and Technology sector. She is a medical doctor with 10 years experience in the private sector. Since 1995, she has been involved in addressing issues pertaining to sexual violence at the Department of Health. She has served on the National Justice Task Team that developed the National Protocol on the treatment of survivors of women and child abuse. Doctor Asmall holds a MB ChB from the University of Natal.

Cheryl de la Rey (Prof)

Professor De la Rey is Deputy Vice-chancellor of the University of Cape Town, and an associate professor at the institution. Her responsibilities include research, innovation and postgraduate studies. She is a member of the Executive Evaluation Committee of the National Research Foundation, and serves on the boards of Agenda (a women's empowerment company) and the CSIR. Professor de la Rey has a notable research track record, and has been extensively published. Her most recent co-edited book is titled *Race, Racism and Knowledge Production and Psychology in South Africa*. Recent research papers focus on leadership, gender and higher education. Professor De la Rey completed her Bachelor of Arts, Honours and Master's degrees at the University of Natal. She completed her PhD at UCT, for which her thesis covered the career narratives of women professors in South Africa.

Nicole Dewandre (Ms)

Ms Dewandre is Head of the Women and Science Unit of the European Commission where she has worked for 20 years. She is responsible for research within the context of the European Union. Dewandre is a civil engineer by training and holds a Master's Degree in Operational Research from the University of California, Berkeley, as well as a degree in Philosophy from the Free University of Brussels.

Catherine Didion (Ms)

Ms Didion has been Executive Director of the Association for Women in Science (AWIS) in Washington, DC since 1990. Currently, she is co-chair of the Science and Transportation Task Force for the Coalition for Women's Appointments. Didion has over 15 years' experience administering non-profit organisations. She worked closely with the Bush and Clinton Administrations to facilitate the appointment of women scientists to high-level federal positions. Didion is one of the co-founders

of the Global Alliance Diversity Project, is active on many advisory boards and is a judge for the National Inventors Hall of Fame in the United States of America.

John Duncan (Prof)

As Dean of Research at Rhodes University, Professor Duncan is responsible for promoting all aspects of the institution's research. One of his main focus areas is on maintaining and developing a strong research culture among black and women researchers. Professor Duncan is actively involved in research promotion nationally through his involvement with a number of research bodies and committees. He was awarded the following accolades: Gold Medal from the SA Society of Biochemistry and Molecular Biology (2000), the Vice-Chancellor's Distinguished Senior Research Award (2000), and is an elected Fellow of Royal Society of SA (FRSSA). Professor Duncan has a PhD from the University of Natal and was a Post-Doctoral Fellow, at the University of California. He was also a Visiting Professor at the University of Missouri (1987) and the University of California (1992).

Tina Eboka (Ms)

Ms Eboka is Executive Vice-president: Organisational Development and Communications at the CSIR. Her field of expertise is in strategy development and implementation. Eboka is involved with various councils and boards. She was appointed by the Minister of Education to the council of the University of Cape Town in 2002. She also serves as a non-executive board member of Seardel Investment Corporation (SERA), Breathtex (a spin-off company of the CSIR) and Edcon. She holds an MBA in Business Operations/ Project Management from Philadelphia University, Pennsylvania, USA, as well as a BSc in Textile Engineering from the same university. In 1999 she attended the Senior Executive Programme of the Harvard Business School, Massachusetts, USA.

Sharon Fonn (Prof)

Professor Fonn is Head of the School of Public Health of the University of the Witwatersrand. Her most recent areas of work have been in cervical cancer and health systems research, with a special emphasis on quality of care and gender equity in health and health planning. Professor Fonn's specific area of expertise is in the mixing of methods. She works on the interplay between "hard" science and the softer social sciences, that allows us to use the knowledge generated by hard science to develop programmes to improve health at the population level. She was recently involved in an international initiative with the WHO, Centre for Health and Human Rights – of the Harvard School of Public Health and Women's Health Project, University of the Witwatersrand – to produce a curriculum to include gender equity and rights into healthcare programming. She holds a PhD in Public Health.

Erica Johnson (Ms)

Ms Johnson is the General Manager: System Operations in the Transmission Division of Eskom. She is accountable for the real-time reliable operation of the Eskom power system.
She is the first black person and first woman to be appointed to the position of National Control Centre Manager in Eskom. Erica currently holds a leadership position in the Southern African Power Pool, a co-operative body focused on regional integration of electricity networks.
In addition to her leadership roles, she has a research portfolio to maintain as the South African representative of CIGRE, an international research

organisation for the Study of Large High-Voltage Systems) in the area of System Operations and Control. She holds an MSc in Electrical Engineering from the University of Cape Town.

Bongani Khumalo (Dr)

Doctor Khumalo is Chairman of Transnet where his key focus areas include sound and proper corporate governance, superior business performance and financial discipline. Doctor Khumalo, who until recently was strategic adviser to the Presidency, is a former executive director (Human Resources) and deputy chief executive of Eskom. His background includes corporate and political communications, as well as humanitarian and philanthropic work. His academic qualifications and distinctions include an MA in Corporate and Political Communications from Fairfield University, USA; an MBA from Henley University, USA; a D.Admin from Fort Hare University and an Honorary Professorship in Industrial Psychology from Stellenbosch University.

Allyson Lawless (Ms)

Ms Lawless is the Managing Director of Allyson Lawless & Associates (Pty) Ltd, a civil engineering consultancy. Lawless is a Civil Engineer by training and is past president of the South African Institution of Civil Engineering. She is a founder member of the National Association of Women Business Owners as well as Women in Engineering (SA). Lawless is a member of the task team to review and restructure Civil Engineering Education in South Africa. She was also instrumental in launching the Local Government Engineering Empowerment Programme in 2000. She holds an MSc in Structural Engineering.

Steve Lennon (Dr)

Doctor Lennon is Managing Director: Resources & Strategy Division of Eskom, as well as Chief Information Officer of Eskom. He is responsible for long-term strategic planning, information strategy, as well as market and investment strategy, corporate environmental affairs and research, development and demonstration. In 1997 he was elected the Eskom Executive of the Year. Doctor Lennon is advisor to the South African Government on science and technology, energy policy and environmental matters. He is also a member of the National Advisory Committee on Innovation (NACI). He is chairman of the South African Board for the International Council of Scientific Unions; the National Science and Technology Forum and the International Chamber of Commerce. He is also vice-chairman of the SA Scientific Committee for Climate Change and acts as a trustee of the National Innovation Fund. Doctor Lennon holds a PhD from the University of the Witwatersrand.

Lydia Makhubu (Prof)

Professor Makhubu is Vice-chancellor of the University of Swaziland, as well as a Professor of Chemistry. Her research interests are in the fields of traditional medicine, science, technology and development women in science and higher education in Africa. She is a member of the Executive Board of UNESCO; the Dag Hammarskjold Foundation and the Board of Trustees of the International Foundation for Science. Professor Makhubu is chairperson for the Association of African Universities Scientific Committee and is chancellor of the Women's University in Africa. She is president of the Third World Organisation for Women in Science and holder of the UNESCO chair for Women in Science

in Africa. Professor Makhubu has a PhD in Medicinal Chemistry from the University of Toronto, Canada.

Shirley Malcom (Dr)

Doctor Malcom is the Executive Director for the Education and Human Resources Program of the American Association for the Advancement of Science (AAAS). AAAS is the largest general science organisation in the world and publisher of *Science Magazine*. Doctor Malcom also chairs the Committee on Capacity Building in Science of the International Council for Science and is a member of the Gender Advisory Board of the UN Commission on Science and Technology for Development. In the United States, Doctor Malcom has been a member of the National Science Board, the policy-making body of the National Science Foundation, and served as a member of the President's Committee of Advisors on Science and Technology during the Clinton Administration. Doctor Malcom holds a doctorate in ecology from Pennsylvania State University.

Valerie Mizrahi (Dr)

Doctor Mizrahi is Director of the MRC/NHLS/WITS Molecular Mycobacteriology Research Unit. The laboratory is focused on developing and applying molecular genetic tools for identifying, validating and characterising new drug targets and vaccine candidates for tuberculosis. She is also a research professor for the School of Pathology at the University of the Witwatersrand and is active in numerous review panels and university committees. Doctor Mizrahi has a PhD in Chemistry from the University of Cape Town.

Zuki Munyai (Ms)

Ms Munyai is Chief Executive Officer of Muvhango Technologies, an ICT company wholly owned by black women. The company is involved in training young people in telecommunications and electronics and encourages them to become entrepreneurs and job creators. Her technical knowledge includes Specialised Training on Lucent Communication Systems, Voice and Data Solutions. She is also co-ordinator of South African Women Entrepreneurs Network (SAWEN) and a member of the Black Information Technology Forum, Women in ICT and SACF. Munyai was the recipient of **the dti**'s Small Enterprises Award (Technical Excellence). She is a board member of the Limpopo Department of Trade and Industry and the Limpopo Department of Transport. Munyai has a BSc in Information Systems and a National Diploma in Telecommunications.

Khungeka Njobe (Ms)

Ms Njobe is the Executive Director of the CSIR Water, Environment and Forestry Technology (Environmentek) Business Unit. Prior to her current position, she worked as the director for Biodiversity Policy and Planning at the National Botanical Institute (NBI), South Africa. In this position she established a new directorate within the organisation, incorporating two programmes on bio-regional planning and implementation and on threatened species. At the same time she positioned the NBI as the technical support to biodiversity policy development initiatives in South Africa. Before that, in her position as Director: Biodiversity Management at the Department of Environmental Affairs and Tourism (DEAT), she was responsible for providing technical leadership on biodiversity both with respect to global and national policy processes and initiatives. Before that she was a Sector Co-ordinator of the National Research and Technology Foresight Initiative. She has a Master's degree in Zoology.

Bongiwe Njobe (Ms)

Ms Njobe is Director General of the National Department of Agriculture. Her particular interests lie in gender issues and land and agricultural policy matters. Njobe has 14 years' experience in agriculture, including farm management in Zambia and Tanzania and academic work at the School of Agriculture and Rural Development of the University of Pretoria. She worked as a Manager at Whitbi Enterprises, where she was responsible for the export of fresh fruit and vegetables to neighbouring African countries. She also worked at the Foundation for Research Development now the National Research Foundation) where she was programme co-ordinator for the University Development Programme that focused on creating scientific capacity at historically black universities. Njobe holds a Master's in Agriculture from Bulgaria, where she completed a thesis in plant breeding.

Susan Nkomo (Ms)

Ms Nkomo is the Director of the Office on the Status of Women in the Presidency where she is responsible for gender mainstreaming, policy development, capacity development and the co-ordination of a gender management system. Nkomo serves on the Council for the Development of Economic and Social Science Research in Africa; the Association of African Women in Research and Development; the Women's Development Bank; and the South African Netherlands Programme on Alternatives to Development. She holds a Master's in Gender and Development Studies from the Institute of Development Studies, University of Essex.

Tebello Nyokong (Prof)

Professor Nyokong is Professor of Physical-Inorganic Chemistry at Rhodes University, Grahamstown. Her main research drive is photodynamic therapy of cancer. This is a relatively new approach to cancer diagnosis and treatment, using a combination of oxygen, laser light and a photosensitiser. She is also committed to linking women science researchers. These efforts include organising symposia involving women from the SADC region. She is involved with the African Academy of Sciences Project in promoting science to girls and women. Additionally, Professor Nyokong is involved in promoting science and mathematics to grade 7 to 10 learners in all high schools in Grahamstown. Professor Nyokong serves on the board of the Women in Science and Technology in Africa Network, an organisation sponsored by the Rockefeller Foundation and UNESCO. She is also vice-chairperson of the Sasol SciFest Advisory Committee and chairman of the Rhodes Scholarship Selection Committee for the Eastern Cape and Free State. Professor Nyokong holds a PhD in Chemistry from the University of Western Ontario, Canada.

Elizabeth Rasekoala (Dr)

Doctor Rasekoala is a chemical engineer with 18 years' experience in the industry, both in her native country, Nigeria, and currently in the United Kingdom, where she is an industrial consultant doing technical engineering and management for companies. She is founder of the UK-based African-Caribbean Network for Science & Technology, an NGO working to address gender and race inequality in scientific enterprise. She is a member of the UK Qualifications and Curriculum Authority (QCA) – Race & Gender Policy Group, the UK-UNESCO Science Education Committee, and the Opportunity Now – National Focus on Women Panel. Doctor Rasekoala has also been contributing to initiatives in South Africa, such as National SET Week, and the National Science and Technology Programme for Young Women. She supported the development

of specialist subject associations and professional societies for the development of teachers of Mathermatics, Science and Technology, and women engineers. Doctor Rasekoala received an innovation award from the Commonwealth Association of Science, Mathematics, and Technology Educators in 1999.

Helen Rees (Prof)

Professor Rees is Executive Director of the Reproductive Health Research Unit of the University of the Witwatersrand. The unit undertakes relevant research on both women's health and STDs/ HIV/AIDS. She is a member of the Executive of the Medicines Control Council and National Health Research Ethics Committee, and chairs the National Termination of Pregnancy Advisory Group and the Planned Parenthood Association of South Africa. She also serves as Technical Advisor to the World Health Organisation; International Planned Parenthood Federation; International AIDS Vaccine Initiative; and Family Health International. Doctor Rees was awarded the honour of Officer of the British Empire (OBE) by Queen Elizabeth II and is a member of the Royal College of General Practitioners (with a distinction in oral health. She holds a Master's in Social and Political Sciences from Cambridge.

Mala Singh (Dr)

Doctor Singh is Executive Director of the Higher Education Quality Committee of the Council on Higher Education. Her current interest is in policy and planning issues in the transformation of South African higher education, as well as the Internationalisation of higher education and quality assurance. She is vice-chair for the Regional Scientific Committee for Africa. She also serves as a member of the Task Force for the UNESCO Global Forum on International Quality Assurance, Accreditation and the Recognition of Qualifications. Doctor Singh holds a D.Phil from the University of Durban-Westville.

Jennifer Thomson (Prof)

Professor Thomson is Professor in the Department of Molecular and Cell Biology at the University of Cape Town. She is a council member of the Royal Society of South Africa and, in 2000, received the Women in Science Award from the SA Association of Women Graduates. She serves as advisor to the World Health Organisation and also sits on the Distinguished Advisor Council for Biotechnology Information of the USA. She is a board member of the International Service for the Acquisition of Agribiotech Acquisitions. Professor Thomson, was awarded the L'Oréal United Nations Educational, Scientific and Cultural Organisation (UNESCO) Award in March 2004. This international award, which is judged by a panel that includes two Nobel-prizewinning scientists, recognises outstanding women scientists around the world. Professor Thomson heads up a team of molecular biologists at UCT, who have spent the past decade engineering maize to be resistant to the maize streak virus. The virus is widely found in Africa and stunts growth and cob development in affected plants. Professor Thomson is a member of NACI and also serves as chairperson of the Western Cape: SA Women in Science and Engineering. She was involved in drafting the South African Biotechnology Strategy. She also serves as a referee for various national and international scientific journals. Prof Thomson holds a PhD in Microbiology from Rhodes University, Grahamstown.