

The chemistry of equality

Gisèle Dodji Dovi reports from West Africa on efforts to get girls involved in careers based in science and technology. Better access to education is key.



WOMEN IN AFRICA play a critical role within community, productive and reproductive life – engaging in agriculture and establishing business enterprises, as well as providing health care and education. As they make up half of the population, they constitute a critical factor in development.

It is often mistakenly believed that girls struggle to achieve at school, and that they are poor at science, mathematics and technology (SMT). But it is lack of opportunity rather than ability that is the limiting factor. With limited resources to spend on education, poorer families may send their boy children to schools, keeping girls at home to provide support. Opportunities to study at home are limited, and early marriage and pregnancy add further potential blocks to education. For many young women, therefore, the prospect of reaching university is slim. And even among those who achieve this, the number studying science is relatively low; in Togo, for example, only ten per cent of female students take science subjects.

Sub-Saharan Africa has the world's

lowest literacy rate, which is directly linked to poverty. And even among those women taking formal education, the number who study science subjects is much lower than men. According to figures from the Association for the Development of Education in Africa (ADEA) and the Forum for African Women Educationalists, of the 22 per cent of girls attending secondary school, only ten per cent study science-related topics. At present, women form only 15 per cent of the scientific field in Africa and only one per cent of them are in leadership positions.

To address such issues, ADEA's Female Education in Mathematics and Science in Africa programme set up projects in Burkina Faso, Mali, Senegal and Ghana between 1995 and 2001 to increase the number of girls enrolled in SMT. Policy makers, students, teachers and parents have all been targets of strong lobbying campaigns aimed at changing attitudes. As a result, curriculum reform has taken place, and SMT books and teaching methods have changed. The African Network of Women Scientists and Engineers is now undertaking similar work through its member associations in the sub-region.

"Girls will excel in science only if they have models to follow, and if science education addresses gender inequalities," says Professor Isabelle Glitho, president of the Association of Togo Women for the Promotion of Science and Technology.

To help achieve this, her association organises science clubs for girls, runs science competitions, and sets up mentoring schemes for women researchers. The ultimate goal is to raise the number of girls and women in science in universities and help them become qualified researchers.

Other efforts to achieve these goals include the creation of a UNESCO Chair for Women, Science and Technology in Ghana in 1995, and, more recently, the selection of Burkina Faso to host another Chair for Gender, Science and Technology in Francophone West Africa.

Although these improvements are a welcome step forward, it will take time before significant changes take place. Policy makers and education authorities, as well as civil society organisations and parents, need to increase their efforts to demystify science and technology, and to provide science communication role models for girls and young women. In this newsletter, a number of prominent 'model' women scientists describe the challenges and opportunities they face.

Gisèle Dodji Dovi is a Leadership for Environment and Development (LEAD) fellow based in Togo

About SciDev.Net

Since its launch in 2001, the Science and Development Network has established itself as the world's leading electronic source of news, views and analysis about science, technology and the developing world.

What SciDev.Net offers

- A **free-access website** providing news, views and background information
- A **sub-Saharan gateway** with regional news and analysis, provided by correspondents, researchers and policy advisors across Africa
- **Capacity-building workshops** on science communication issues
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Photo winner



See the result of the **SciDev.Net photography competition**. There was an excellent response and the winning shot is shown in full on the back page...



Education for girls: in the laboratory (top) and in the field (above)



Tuning in to women farmers

Sarah Cardey outlines a radio project based on agricultural research

A Cameroonian woman pulls a small, battered micro-cassette recorder from her bag and disappears into a cornfield, heading for a group of women working there. Beckoning an agricultural support worker to join the group, she begins to record the conversation.

Martha Motoko Biongo is a local journalist specialising in gender and agriculture who works on a project entitled 'Linking Agricultural Research and Rural Radio'. It seeks to use rural radio to communicate information about science and technology-based innovations emerging from agricultural research. The project was set up in 2000 as part of a wider regional initiative backed by the University of Guelph, Canada; the Developing Countries Farm Radio Network; Organisation of Petroleum Exporting Countries (OPEC) and the Food and Agriculture Organisation of the United Nations.

"The project empowers women and increases their access to agricultural technologies," she says. "It gives them better access to innovations, and challenges the subsistence agricultural roles they often have had to play."

It is based on the idea that strengthening

partnerships between farmers, researchers and radio broadcasters allows women to become involved in dialogue about issues that can improve their lives.

Maize cultivation has been one successful focus of the radio project. Maize is traditionally grown for two seasons, with income from the first season being used to cover household costs, while that from the second season often provides funds to pay school fees. But many women can't afford high quality seeds for the second season, and also lack access to improved agricultural technologies that would enable them to increase the overall efficiency of their farming practices.

The project uses radio to share information about maize cultivation through interactive programming. "Each week we put together a ten minute broadcast slot devoted to second season maize production, covering planting, cultivation and marketing," explains Biongo.

Within weeks of each programme's broadcast, women farmers are visited by agricultural extension workers, often joined by Biongo, cassette recorder in hand. During these field visits, Biongo and

the extension worker respond to questions stimulated by previous lessons, and conduct further interviews with women in their fields. It's a model that is being copied across sub-Saharan Africa. In 2002, regional teams met at a workshop in Kumasi, Ghana, to explore further ways of creating partnerships and raising money for collaborative research-extension-radio activities. In December 2004, a further workshop will involve French-speaking African teams in Dakar, Senegal.

Across Cameroon, Ghana and Uganda, it is estimated that more than 1,280 farmers have been interviewed to assess their needs and participate in programmes. These interviews have involved 41 women farmer groups, 12 schools, an orphanage and 81 teachers.

Sitting on her doorstep while her cassava dries in the yard and her palm oil bubbles on the fire a woman farmer discusses the impact that radio has on her life. "I listen to the agricultural programmes because I like to hear about crop production and learn new technologies. With the lessons I'm learning I can see my yield is improving. When I have a question, it is answered. I hear information on the radio and I ask the extension worker. They are listening to what I say."

Sarah Cardey is a communications in development advisor, specialising in gender and HIV/AIDS. She is also a research assistant on the project Linking Agricultural Research and Rural Radio and is based at the University of Guelph, Ontario.



Martha Motoko Biongo (right) interviews a farmer



The science of success

South Africa recently announced the winners of its second annual Women in Science awards. Christina Scott meets the Zimbabwean recipient of the All-Africa science fellowship.

In August this year, after five year's work studying sorghum, the traditional African grain, Zimbabwean scientist Bethule Nyamambi (left) travelled to Johannesburg, South Africa, to receive the prestigious all-Africa woman scientist fellowship, awarded by the South African government's Department of Science and Technology.

The R100,000 (US\$15,000) prize facilitates further study at a university or research institute within South Africa. Nyamambi will take advantage of South African technology and resources and will then return home.

As part of her PhD in animal science at the University of Zimbabwe, her research into sorghum originally focused on chicken feed. But its application quickly broadened out.

"We made huge strides in helping people plant sorghum and use it as a source of protein for their chickens," Nyamambi explains. "In the wake of HIV/AIDS it has become an increasingly versatile crop to grow and use, not only for feeding chickens but also for better nutrition. Sorghum has been a great cheaper alternative for those that have been willing to substitute it for maize."

"While working on my thesis, my biggest challenge has been the brain drain. I saw most of my initial team of supervisors leave the country for better opportunities abroad," she explains.

"It has been quite difficult working during the food shortages and petrol queues, but it has been as tough for me as for the next person. The challenge of inflation is one that many Zimbabweans have learnt to deal with."

Breaking the mould

Judi Wakhungu is one of Kenya's best-known scientists. Better science communication, she believes, is crucial to international development. And more women should be involved. By Liz Nganga

Judi Wakhungu is an endorsement of what science and technology can do for Africa — and women. She is currently executive director of the African Centre for Technology Studies (ACTS), and is one of Kenya's few women geologists.

"Science and technology are the disciplines that develop the basic social infrastructure and add value to products. We must invest more strategically in innovative technology in Africa so that we can think more creatively and succinctly about development," she says.

Wakhungu is among those African scientists taking steps to ensure the continent steps up its research and development efforts. In July 2003, she was involved in kick-starting the commemoration of Africa's Scientific Revival Day, an occasion set aside by the Organisation for Africa Unity (OAU) in 1985, but which had gone unmarked for many years.

Among the recommendations from nine leading African institutions that assembled in Nairobi for the event was the formation of a scientific think-tank. The idea was taken a step further during this year's Scientific Revival Day with the creation of a committee to discuss the setting up of a Science Park at one of the African universities.

But as Wakhungu notes: "This will only work if a policy or practical mechanism is set up by the government to support technology. The difficulty is that politicians are not scientifically inclined, and it takes time and persuasion just to get a scientific idea across."

Engagement with politicians is a continuous process for Wakhungu. "The work of ACTS includes training parliamentarians in the basic elements of science and technology to allow them to make informed choices when passing crucial bills," she explains.

Wakhungu is also determined that the male perspective that dominates science and technology should change. "The benefits of science and technology are not enjoyed equally by men and women," she argues. "A distinct point of view from women is therefore needed to enhance the quality of questions addressed by research in any project."



"We must invest more strategically in innovative technology in Africa so that we can think more creatively about development."

few women pursue the sciences and engineering, examined why drop-out rates for women in these fields were so high, and looked at ways of improving the overall climate for women scientists and engineers.

Within Penn State secondary schools, she says there were too few role models and insufficient knowledge of career opportunities. WISE's sensitisation started with children as young as eight years. Science was made fun; students were made aware of different options available, and were also offered mentoring.

"We also developed programmes to sensitise the faculty to the fact that many women found the science classroom to be a chilly, male-dominated environment, where jokes were often cracked that demeaned women," she says. "We also analysed the curriculum to make it more gender sensitive whenever possible."

Back in Kenya, Wakhungu is keen to encourage the implementation of such ideas in Africa. When she returned in 2000, it was she says, "to be part of the wind of change that was sweeping through the country". Her challenge now is to ensure that this "wind of change" translates into more girls and women pursuing careers in science and technology. She provides a striking example of just how far such a career can take you.

Liz Nganga is press officer at the International Centre of Insect Physiology and Ecology (ICIPE), Kenya, and a freelance writer

"Just go for it!"

SciDev.Net asked three prominent women science communicators to sum up their experiences and to offer advice to women considering a career in science and technology

"A better understanding of the practical application of science encourages young people to pursue the subject. We came up with the idea of a science and mathematics show aimed at senior secondary school students to help popularise the sciences, and my decision to host it was especially to act as a role model for girls."

Marian Ewurama Addy, professor of biochemistry at the University of Ghana, who also presides over, and used to present, a national science and mathematics TV quiz show.

"Mathematics is a universal language, which women must study so that, for example, they can question how economics affects the societies they live in. Through a knowledge of science and technology women can assist development by understanding how these can address the need for essentials such as clean water, nutritious food and health care."

Yassine Fall, an economist from Senegal, currently a United Nations consultant in International Aid and Development for West, Central and East Africa.



"My biggest achievement is working with farmers and convincing them that what they see affecting their crops are diseases that can be treated. I do not feel anything special being able to compete and perform equal to men. My message to girls and women is that there is nothing that prevents them trying any job. Go for the job you want, and you will get it."

Fina Opio (pictured above), plant pathologist and director of Namulonge Agricultural and Animal Research Institute (NAARI), Uganda.



COMPETITION WINNER

Here is the winning entry in this year's SciDev.Net photography competition. It's a picture of children in Niger taking part in a march against smoking, by Bachir Chaibu, from Naimey, Niger. Bachir is the recipient of a wind up radio – congratulations. Many thanks to all who entered. We received over 150 entries and your pictures will be used to illustrate our website and publications in the future.

NEW FROM SCIDEV.NET

User questionnaire

In August we conducted an electronic questionnaire to find out more about how you are using the site and to suggest ways of improving it. We received 1,574 responses and around half were sent from users based in the South. The results were encouraging and the full report will be posted on the website this October. The majority of users said that the website kept them up-to-date with relevant news, provided valuable background information and was a good source of relevant reports and contacts. If you were one of those who filled in the form – many thanks.

SciDev.Net Annual Review

An electronic version of our Annual Review 2003-2004 is now available at www.scidev.net. If you would like to be sent a print copy please send your postal address to africa@scidev.net.



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Science communication event

In the last issue of the newsletter we alerted readers to an upcoming meeting and workshop in Nairobi, Kenya. The new date for this event is March 2005; keep an eye on the SciDev.Net website for further details. It will focus on the practical application of science communication, and look at the links between research and policy, with presentations from experts and the opportunity for discussions in smaller groups.



SciDev.Net internships

This summer Gloria Katusiime, a science journalist from

Uganda, came to SciDev.Net's London base to gain work experience and training. In addition to her work with us she spent time with One World, the Institute of Development Studies and *Nature*. She also visited Thailand for a week to cover the bi-annual International HIV/AIDS conference, and came back to report for us on the event (you can see her video clips at <http://tv.oneworld.net/tapestry?story=1161&window=full>). Here is what she says:

"I can honestly say that the month I spent at SciDev.Net was remarkable. I acquired a wealth of new experiences. Am I a better science writer as a result? I definitely think I am, as my understanding of science communication has improved. The knowledge I have learnt will help me communicate science issues in Uganda. I hope other journalists are given the same opportunity as I was and can spend time with the SciDev.Net team."

So, would you like to come and visit us? If you are a science communicator based in sub-Saharan Africa and you are keen to develop your professional skills, please send your CV, cuttings and a cover letter to africa@scidev.net. We hope to be able to offer one or more such places each year.

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Science communication and gender LINKS AND RESOURCES

GST Gateway: The Gender, Science and Technology Gateway offers a host of resources, publications and links and has a section of its site dedicated to science and technology education and events in Africa. It also offers links on careers and employment in Africa, along with gender and science statistics, networking organisations, discussion lists... it has the lot!
<http://gstgateway.wigsat.org/reg/Africa>

And if you don't find what you need on the GST Gateway, try these:

AWSE: Africa Women in Science and Engineering is an organisation running empowerment programmes to enhance women's involvement in research, education and development. In August 2004 it held a leadership workshop for women scientists and engineers. For further information contact awse@cgjar.org

BRIDGE: An information service supporting gender mainstreaming. It offers an online searchable database, contacts and print materials.
www.siyanda.org

INWES: The International Network of Women in Engineering and Science (INWES) aims to strengthen the capacity of women and girls in all aspects of science, technology, engineering and mathematics.
<http://www.inwes.org/>

TWOWS: Third World Organisation for Women in Science is based at the offices of the Third World Academy of Sciences (TWAS) in Trieste, Italy. It is the first international forum to unite eminent women scientists from the South with the objective of strengthening their role in the development process and promoting their representation in scientific and technological leadership.
www.twows.org

UNIFEM: The United Nations Development Fund for Women provides financial and technical assistance to innovative programmes and strategies that promote women's human rights, political participation and economic security.
www.unifem.org

Women in Science and Technology study:

The Millennium Science Initiative based at the Institute of Advanced Studies, Princeton, US is carrying out a study to identify the barriers facing women pursuing careers in science and technology in the South. To take part and to find out more please contact edda@magnus.flife.co.uk

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