

## Women in science, Third World perspectives

LYDIA P. MAKKUBU

**Lydia Makkubu reflects on the socio-cultural dimensions at work in the Third-World that affect the numbers of women scientists, and introduces interventions that may help improve the situation.**

The historical development of civilizations in Asia, Africa, Arabia and Europe have common features with respect to the social status and roles of women. Whether or not you believe in the existence of God the divine delineation of male and female functions permeates social organization throughout the world and more importantly presents women as inferior to men, physically and mentally. The belief in the superiority of men over women has persisted for centuries, and the view that women should live under the authority of their fathers, or husbands, are still prevalent in many societies -- especially in the developing world.

The outcome of this social order has been the different preparation of men and women to assume their roles in society; even affecting curricula in formal education - where for decades girls have been channeled to domestic sciences and boys to subjects such as woodwork and metal work in anticipation of their masculine roles. A gender-based approach to education persists to the present day in many parts of the world where curricula for girls de-emphasize the physical sciences.

Although this has changed in many countries, the approach to teaching science has little regard for the preparation of girls for careers in science<sup>1</sup>. Science and technology have been termed "engines of social and economic change", so it is essential that women be well grounded in these areas in order to enhance their roles as mothers, social educators and transmitters of ideas between generations.

The strong social and cultural traditions which have laid a foundation for the determination of women's status in society should be kept in full view. Such awareness must form the frame on which strategies to achieve gender equality in science and technology, must be formulated.

### **Progress so far: women, science, and life science**

Data from selected universities in Africa and the Middle East show that the percentage of women at the professional level is very small. While in countries like Venezuela the gap in numbers between men and women in science is not large, it is a matter of concern that there are so few women at the scientific leadership level of academic and research institutions - where policies that guide the practice of science are formulated.

In order to get to the top many pioneer women scientists overcame numerous hurdles, ranging from outright rejection in scientific institutions, to open discrimination in appointments. Women were seen as potential liabilities who could withdraw anytime from teaching, research and other scientific activities in order to get married and raise children. For many women the scientific career has meant a choice between marriage, motherhood and science. Should women have to face this choice? Can women be wives, mothers and scientists at the same time?

Women show definite strength in the life sciences in almost all parts of the world. This female inclination towards the life sciences must be considered a strength in the context of many developing country concerns. The use of natural resources, health, food production, nutrition and education are all areas in which women from all walks of life have been intimately engaged over centuries. Can this modern scientific strength be combined with traditional involvement and accumulated wisdom to produce a plan of action in which

women can offer unique leadership in science for the benefit of humankind focusing on the use of science and technology to alleviate human suffering, poverty and deprivation?

Women, the traditional educators and transmitters of cultural values, must be in the vanguard of the integration of science and culture, of science education, of research and development policy making and in the creation of a vision for the 21st century in which human needs will form the focus for the scientific and technological development endeavors.

### **Interventions designed to address gender imbalances**

#### 1. *The Scientific Community*

There must be strong advocates driven by conviction, advancing well reasoned arguments for change. These must be men and women scientists convinced that paradigm shifts are needed for women to contribute to scientific and technological development. Such shifts must acknowledge that women perform social roles fundamental to human development yet have a potential to use these roles to infuse a humane character into science and technology making them more responsive to human needs.<sup>2</sup>

#### 2. *Confronting gender stereotyping in education*

One of the greatest obstacles to women's progress in many parts of the world are inadequate opportunities for education. One out of three women in the world is illiterate; fewer girls attend school than boys; and within the classroom (especially during science lessons) boys receive more attention from teachers and opportunities for practical work. Many interventions have been suggested to combat the stereotyping of the science curriculum.<sup>3</sup>

#### 3. *Building confidence in young girls to pursue scientific careers*

Several countries such as Botswana and Ghana have organized "science clinics" for girls. Female high-school students work in camps on hands-on projects, interacting with well-known female scientists. This project has been extended to several African countries to help teachers and students, curriculum designers, career guidance teachers and counselors confront gender stereotyping in science. Such intervention requires persistence by the scientific community, and are long-term projects which are essential for confronting basic attitudes towards science.

#### 4. *Promoting post-graduate training of women to the PhD level*

For many, especially in some developing countries where post-graduate training is undertaken abroad, it is very difficult for women to leave their families. Many choose family, rather than career, in accordance with social expectations. One intervention involves giving grants to women MSc holders in sub-Saharan Africa to embark on sandwich-type PhDs at centres of excellence in the South - avoiding prolonged parting of women from their families. This programme acknowledges women have important roles to play as mothers and wives and need special support to develop as scientists and academics. Strengthening of post-graduate training in science and technology in the South is important in encouraging more women to pursue higher-level studies.

#### 5. *Strengthening women's research output in universities and research institutions*

One proposed intervention is to strengthen research collaboration among women to create groups that can tackle sizable research projects, and can continue to work even if one member has been slowed down by family responsibilities. One such network - Women in Science Network in Africa (WISTAN) - has been formed. Such networks could encourage women to form research support groups to enable them to research and publish regularly.

### **Conclusion**

Throughout my academic training and subsequent experience in the world of science and university administration, three convictions have increasingly shaped my own paradigm:

- a. that women are well able to hold their own in the "mans world" of science and technology and they have a unique dimension to lend to the scientific enterprise
- b. that great potential is being lost by failure to encourage more women to enter the world of scientific exploration
- c. that subsequent generations will judge us, the scientific community, on our ability to use science to benefit the poorest, most disadvantaged sectors of society

We have to consider afresh the role of women in the scientific enterprise, to think it out again from the beginning. We must secure for women an entirely new value and significance and we cannot do that unless women are allowed to have a say in determining what that value should be. Only when we listen to the opinions of the disadvantaged will we be able to serve the interests of humanity as a whole. An equitable partnership of men and women scientists can surely achieve this goal.

**Professor Makkubu,**

is the Vice-chancellor of the University of Swaziland, and president of the Third World Academy of Women in Science.

**References**

1. Nadine Plateau, (1995) Coeducational Classrooms. An Unfinished Process. The Scientific Education of girls - education beyond reproach. Jessica Kingsley Publishers/UNESCO Publishing.
2. The Third World Organization for Women in Science (TWOWS), a membership group of 2000 women scientists from all parts of the developing world, could work with organisations to provide ideas on how women's potential could be developed and tapped without removing them from their social roles which are so fundamental to human existence.
3. Female Education in Mathematics and Science in Africa (FEMSA) is a project of the Association for the Development of Education in Africa (ADEA) Working group on Female Participation (WGFP), of which the Rockefeller Foundation is the lead agency. Its main goal is to promote the participation and performance of girls in science, mathematics and technology subjects at primary and secondary schools by mounting in-class interventions.