

GLOBAL JOURNAL OF ENGINEERING SCIENCE AND RESEARCHES SCIENCE AND TECHNOLOGY, IMPORTANT AND INTEGRAL TO THE ADVANCEMENT OF WOMEN

Dr. Baidya Nath Roy*

*Assistant professor, Metallurgical Engineering Department, B.I.T Sindri, Dhanbad, Jharkhand, India-828123

ABSTRACT

Science is acknowledged as the basis for the high quality of life and the dynamics of industrialized economies makes it seem a tool for oppression in the eyes of many in the developing world. Quality of life is based on the development of materials, development of technology and development of the mindset of the users. We've assembled a list of the major ten advances in materials science over the last 50 years. The experts believe people in the developing world desire what the developed world already has in order to experience this quality of life and economic well-being, which, ironically, is also perceived as giving the developed world power over developing countries. Although the developed world may view science as power for self-determination, the developing world may not see it that way. In addition, the experts observe, women in the developing world tend to have a limited background in Western science, and they may believe it to be a negative force for their cultures and for women themselves. Many women in the developing world are technophobic and technology are male-dominated fields, and many believe a good deal of damage has been wrought by the application of science and technology, including high-technology wars and the destruction of the environment. If you believe materials scientists are unsung heroes, that our work goes unnoticed and unheralded, here is your ammunition. With our time limit of 50 years, the list of chronological development of science and technology in general and material science development in particular, is of immediate relevance. It is about how materials science is affecting our world today. Arena of material development is because of development in science and technology of last 50 years. Development of material science may be viewed in the form of International technology roadmap for semiconductors, Scanning probe microscopes, Giant magneto resistive effect, Semiconductor lasers and LEDs, National nanotechnology initiative, Carbon fiber reinforced plastics, Materials for Li ion batteries, Carbon nano tubes, Soft lithography, Meta materials. One of the purposes of writing this paper is to see the world through women's eyes.

Keywords- quality, industrialized, developed world, high-technology, genetically engineered, world conference.

1. INTRODUCTION

Critical areas of concern for women upliftment are women and poverty, education and training of women, women and health, violence against women, women and armed conflict, women and the economy, women in power and decision-making, institutional mechanisms for the advancement of women, human rights of women, women and the media, women and the environment, and the girl child.

Inequality exists between boys and girls, women and men, in access to the use or to the benefit of science and technology, and in the opportunity to act as agents in the development and control of science, engineering, and technology for human survival and improvement of the quality of human life. Policies and plans for the use of science and technology for sustainable development are gender insensitive and do not respond to the needs and aspirations of both men and women equitably. Gender planning is not an end in itself but a means to bring a different perspective and a new intellectual dimension to the development process one that does not generate merely growth but rather, growth with justice and equity.

Research by women scientists in African countries, though very small in amount, is an extension of the home, and concerned with agriculture, health, nutrition, and education; i.e., these are peaceful activities as against research in physics, biology, chemistry, and technology, which is more concerned with activities leading to war and domination. What greater role could these women play? They could promote science as a learning process, a way of doing things that links scientific knowledge directly to tools for overcoming barriers for women. A gender-fair scientific education is key to achieving the goal of scientific education for all.

An essential role of women scientists is to change the global intolerable into developmental opportunities. For turning population explosion into reproductive health, poverty and environmental degradation into sustainable human development, and violence into peace and cooperation. All the knowledge and creativity of both men and women in science are needed for this change.

Girls and women, as half of the world's population, must be viewed as intellectual assets and provided opportunities to enhance their education. Women often play special roles within the society and the family that makes it even more important that countries invest in their education and literacy in science and technology.

Women must be viewed as full-share partners and participants in all aspects of science and technology. Science and technology, as fundamental components of development, are transforming patterns of production, contributing to the creation of jobs and new job classifications, and ways of working, and contributing to the establishment of a knowledge-based society. Technological change can bring new opportunities for all women in all fields, if they have equal access and adequate training. Women should also be actively involved in the definition, design, development, implementation and gender impact evaluation of policies related to these changes. Many women worldwide are yet to effectively use these new communications technologies for networking, advocacy, exchange of information, business, education, media consultation and e-commerce initiatives. For instance, millions of the poorest women and men still do not have access to and benefits from science and technology and are currently excluded from this new field and the opportunities in presents.

In the developed world, science and technology are accepted as critical engines for economic growth and improvements in the quality of life. This perception holds despite the fact that some groups consider certain impacts of technology to be negative. The poor people in the developed world are better off in the material sense than poor people elsewhere. For example, those in developed nations often have access to washers, dryers, and refrigerators, and few live without electricity and phones.

This has eased women's daily lives and has improved their quality of life by providing clean water at the turn of a spigot, simplifying housework through labor-saving devices, allowing easy shopping on the Internet, and increasing the lifespan of American women. Women now have a subjective sense of feeling physically better even while growing older, and the expectation that, if one is pregnant, one's child will be born alive and healthy and will live to maturity. This lifestyle is, in many ways, very high-level when compared with that of the rest of the world.

Some woman from developed countries might argue that the broad application of science and technology is destroying ethics. For example, with the prevalence of computers, children have access to pornography and other adult material with which they are not equipped to cope. From this viewpoint, women might have a demanding lifestyle with little discretionary time, as they simultaneously work outside the home, run a household, and rear children.

On the one hand, the Western lifestyle is a powerful and persuasive argument for women in developing countries on the potentially positive role of science and technology in their lives. For example, they like television, flying, and the power of reproductive choice.

There is a very interesting and meaningful story in this connection as follows: Three people are walking along a river and they see there are lots of babies in the water. The first person dashes into the water and starts throwing babies out onto the banks. The second person jumps in and starts teaching babies how to swim. The third person starts running upstream away from the babies. Where are you going? There are babies in trouble here! The third person yells back: There's someone upstream throwing babies in the water. I'm going to find out who it is and what is going on. Science and technology impacts on the advancement of women and the impacts of women on science and technology are totally interrelated.

The Role of Science and Technology in the Advancement of Women Worldwide

In the developed world, science and technology are accepted as critical engines for economic growth and improvements in the quality of life. This perception holds despite the fact that some groups consider certain impacts of technology to be negative. Even poor people in the developed world are better off in the material sense than poor people elsewhere

Some woman from developed countries might argue that the broad application of science and technology is destroying ethics. For example, with the prevalence of computers, children have access to pornography and other adult material with which they are not equipped to cope. From this viewpoint, women might have a demanding lifestyle with little discretionary time, as they simultaneously work outside the home, run a household, and rear children. Still, the experts observe that in the United States, for example, the economy is so influenced by high technology that gender

On the one hand, the Western lifestyle is a powerful and persuasive argument for women in developing countries on the potentially positive role of science and technology in their lives. For example, they like television, flying, and the power of reproductive choice. They view the Western lifestyle as desirable and want to experience the quality of life enjoyed in the developed world.

On the other hand, the very fact that science is acknowledged as the basis for the high quality of life and the dynamics of industrialized economies makes it seem a tool for oppression in the eyes of many in the developing world. The experts believe people in the developing world desire what the developed world already has in order to experience this quality of life and economic well being, which, ironically, is also perceived as giving the developed world power over developing countries. Although the developed world may view science as power for self-determination, the developing world may not see it that way.

In addition, the experts observe, women in the developing world tend to have a limited background in Western science, and they may believe it to be a negative force for their cultures and for women themselves.

Many women in the developing world are techno-phobic and technology are male-dominated fields, and many believe a good deal of damage has been wrought by the application of science and technology, including high-technology wars and the destruction of the environment.

Two sides exist with respect to science and technology. These groups are .pro. science and technology and they form a network. On the other side are organizations that evolved from the anti-intellectual and women's movements of the 1960s. These groups also form a network. They exhibit distrust of the way science and technology have been developed. The Women, Environment, and Development Organization has published strong negative critiques of military science, reproductive science, and environmental science. For example, with respect to reproductive health, the expert says that these women have concerns about such things as forced sterilization of poor women and the mentally disabled, imposition of birth control on people to reduce their birth rates, and upper classes trying to control reproductive functions in lower classes, all of which are viewed as misuse of reproductive science. The expert says these groups fear that human genome mapping and *in vitro* fertilization will be used to exploit women, and that surrogate-mother technology will also be misused. In fact, the expert says that these groups fear the misuse of science and technology in general. She says the movement focuses on how science and technology is misused and does *not* focus on any good flowing from them.

Misuse of science and technology has resulted in contaminated water and landmines. In areas in Eastern Europe and Angola, oil fields that are not maintained properly are devastating the land. But technology can also be used to overcome some of these problems, the expert says, by diagnosing and documenting problems and mitigating or correcting adverse conditions.

One expert characterizes the current situation as two sides having difficulty making contact. The two sides tend to struggle about the appropriate positions to take. The expert says that the women's movement believes the developed countries are not .walking the talk. and the scientific community is *not* willing to say that no research should be done on fetal tissue. The expert says that .rational. decisions are needed, not .all-or-nothing-at-all. decisions. Another facet of the developing world's resistance to Western science is that scientific issues are related to the issues of the particular country, such as its natural resources. Western science may overlook distinctions that are critically important to local populations in the developing world.

This is the idea that indigenous products for medicine in the developing world are being taken away by developed country scientists and patented by Western corporations. The issue of indigenous knowledge is especially important in pharmacological and health-related areas. Companies are trying to patent processes that rural people have used for a long time. In India and Thailand, for example, efforts are now under way to educate people to not give away their indigenous knowledge to anyone who inquires. Large corporations, rather than small businesses, are seen as the problem. The proper use of indigenous knowledge is for small-scale capitalism so that women can profit from the knowledge they have, the experts say. Key issues in development, then, are who will develop natural resources and who will control intellectual property rights.

Another issue concerns the role of science itself. Public understanding of science is critical, in both the developed and developing world. Yet, one expert says science remains enigmatic to the public. It has largely remained aloof and has not committed itself to the role it could play to help women around the world.

Related to this is the observation by one expert that such U.S. federal agencies as the U.S. Agency for International Development and the U.S. State Department once had scientific expertise on their staffs, but now they no longer do. The implication is that the diplomacy arm of the U.S. government has no scientific background, neither men nor women.

Why Science and Technology Are Important

Women the world over want to see advancement in areas they define as crucial to their well-being. Although various ethnic groups are viewed as critical underserved population groups in different countries, women are the one population seen as a critical population worldwide.

We believe science and technology as tools for change should be built as an argument about the nature of social change. Do women want change? What have been the major vehicles, drivers of change? We believe that science and technology have been the engines of profound social change. Examples they cite are the printing press, weaving looms, and the computer. When explained in this way, the experts believe that women will see the truth in the argument that science and technology drive change. The experts believe that, rather than making these simply women's issues, science and technology should be part of broad developmental issues. The tragedy is that, when women are excluded from scientific and technological training, they also tend to think of themselves as marginalized and to behave accordingly. The experts view alienation and poverty as issues of underdevelopment.

Women everywhere may believe they have more important problems to solve than gaining education in science and mathematics which ultimately fosters economic development. Yet, experts say women must become involved if they are to have input into the manner in which science and technology are used and if societies are to benefit from the insights and knowledge that women possess.

The experts say part of making a compelling case that science and technology are crucial in women's advancement lies in making arguments that are compelling to governments around the world because governments have to effect social, political, and legal change. One expert says: .It's not enough for the United Nations or other organizations to favor women's involvement in science and technology. [Social, political, and legal] change is needed at both the local and national levels. More and more people should participate in science and technology in order to have the more positive outcomes for their countries.

The impact of women on scientific discourse may give us another perspective on the doing of science. The experts also believe that science and technology imposed from outside the community do not empower local people.

Women are making progress in gaining equal status in the United States; the experts note that women have better incomes and more decision-making power than they had formerly. Further, because social change takes decades, patience could be a key virtue when considering issues of equality. Solution to the problems of inequality will not be found rapidly. Yet significant change in women's roles has been achieved, partly because of developments in science and technology. Today, gender equity is closer than it has ever been across the globe in general and United States in particular, but further change may take several more generations to achieve.

The experts also note that a good deal of international discussion on development focuses on how to incorporate science and technology into international development efforts. Institutions of higher learning tend to stress their own country's or region's strengths. For example, India has built on excellence in mathematics to improve its capabilities in computational science and software. Japan has sent many students to U.S. graduate education programs and has adapted imported science and technology to fit local needs.

2. WOMEN'S ROLES

Relatively few women have careers in science. Yet, science and technology offer many possibilities for improving women's situations. My notion of women in science and technology includes them as creators, appliers, and users of knowledge and as innovators more than just producers of knowledge. They can bring things together in new ways, not just perform laboratory science. There are two levels of interest of women in science and technology: (a) all women need to have an understanding of the basic science of things affecting their lives, and (b) fewer women need in-depth knowledge of science and technology to use as professionals.

Science and technology impacts on the advancement of women and the impacts of women on science and technology are totally interrelated. Many women serve in support roles for science and technology as administrative assistants, research assistants, and technicians. These women are making important contributions, yet their roles are not often recognized by scientists and their institutions. Many people pursue but do not use science. A mistake made in Western science is thinking of scientists and engineers as producers, but not users, of knowledge. For example, the United men and women scientists would be expected to contribute equally on a daily basis, but individuals have different perspectives. There are even differences in overall perspective among women and between women and men. The international community must pay more attention to women's basic needs, such as adequate food, shelter, medical care, safety, and education.

The argument runs that women have the obligation to see that science and technology are used in beneficial rather than in destructive ways. This is a key point, the way in which science and technology should be institutionalized. This would focus the role of science and technology in solving women's issues by women in science and technology within agencies that work to see these disciplines used in their own countries and internationally. The experts say that this could occur because women may be more interested in ethics than are men. Women becoming more involved in science and technology could mean that science and technology is used more often for constructive purposes than for destructive purposes.

The industrial revolution and subsequent advances in technology have allowed machines to do work that once required human strength. Though most women lack men's upper body strength, machines are effective equalizers, and great advances in women's roles were made during World War II.

Women could work in factories that opened up jobs for them, and factory jobs paid better than female jobs. Women made significant progress during the 20th century. One expert reports that when she started her engineering education, there was almost no place for her to go to school. Now many professionals are concerned about and actively working on recruiting more women into science and technology and many more schools are available to women.

In fact, doctors now tend to be women everywhere, and more than half of medical school enrollments in the United States are women. Although professional status declines when women are in the majority, the eventual result could be gender equalization of the professions.

Men's Perspectives

If access to production and use of science and technology are viewed as important by men, then women around the world need to pay attention and become involved if they are not to be marginalized

3. CONCLUSION

Based on the review of several papers as mentioned under bibliography the following conclusions may be drawn: Now the sexes have a peaceful coexistence but it will take a more longer time. The industrial revolution and subsequent advances in technology have allowed machines to do work that once required human strength. Though most women lack men's upper body strength, machines are effective equalizers, and great advances in women's roles were made after World War II. Women everywhere tend to be closed to science, mathematics, and technology, but this may be because these topics are presented to women as abstract and difficult. If science and technology were presented to women as providing simple solutions to real problems, we believe that women would better grasp and embrace them properly. Then only it would be possible to visualize the development imparted by science and technology.

REFERENCES

1. Diaz-Sprague, R. 1999. *Women in Science in Latin America*. *AWIS Magazine* 11:2; pp. 33, 40.
2. Doyle, R. 2000. *Employment-Gender Disparity: Women and the Professions*. *Scientific American* (282:4); April, p. 30.
3. George, Y. S.; Gittler, A. U.; Bell, N. E. 1997. *Global Linkages for Science Literacy Project: Reports from the Field on Promising Strategies for Educating Girls and Women in Science, Mathematics, and Technology*. Washington, DC: American Association for the Advancement of Science.
4. George, Y. S.; Malcolm, S. M. 1999. *Excerpts Related to Women from the World Conference on Science*.
5. *American Association for the Advancement of Science, September 3.*
6. Homberger, D. 1997. *Eighth International Gender and Science and Technology Association Conference.*
7. *AWIS Magazine* 26:1; p.14.
8. Huyer, S. 1997. *Supporting Womens Use of Information Technologies for Sustainable Development*. Prepared for the Acacia Project, International Development Research Center, February 18.
9. *International Institute for Sustainable Development (IISD). 1995. A Final Report on the Fourth World Conference on Women. Earth Negotiations Bulletin* 14:22; December.
10. *International Institute for Sustainable Development (IISD). 2000. Summary of the 44th Session of the*
11. *Commission on the Status of Women: 3-17 March 2000. Earth Negotiations Bulletin* 14:34 (CSW-44, Summary).
12. Kegel-Flom, P. 1996. *Back from Beijing: A Call for Action*. *AWIS Magazine* 25:1, pp. 14-15.
13. Malcom, S.M. 1999. *Knowledge, Technology, and Development: A Gendered Perspective*. <http://www.wigsat.org/malcom.html> site updated June 23, 1999.

14. Michels, K. 1996. "Gender, Science, and Technology: Platform for Action. *AWIS Magazine* 25:1, p. 28.
15. Michels, K. 1996. "NGO Forum: Looking at the World (and Science) Through Womens Eyes. *AWIS Magazine* 25:1; pp. 16-17.
16. Michels, K.; Schmoltner, A.; Samiei, H. 1996. *Women in Science Worldwide. AWIS Magazine* 25:1, pp.21-24.
17. National Science and Technology Council. 2000. *Ensuring a Strong U.S. Scientific, Technical, and Engineering Workforce in the 21st Century. Washington, DC: Executive Office of the President.*
18. NGO Communications Strategy Proposal. 1995. Beijing, China; <http://www.igc.apc.org/beijing/fcom.html>. Accessed April 13, 2000.
19. Oldham, G.; Achmad, S. 1999c. "Gender Mainstreaming in Science and TechnologyA Global Report." *A Report on the Gender Mainstreaming in Science and Technology Thematic Meeting, World Conference on Science. Nature. Macmillian Publishers Ltd. 1999 Registered No. 785998 England.*
20. Once and Future Action Network (OFAN). 1995. *Science and Technology in the Beijing Declaration and Platform for Action. <http://www.wigsat.org/ofan>.*
21. Presidents Interagency Council on Women. 1999. *Federal Programs Benefiting Women and New*