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Arab women's participation
in the formulation of scientific knowledge
to ensure environmental sustainability

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The concept of sustainable development that I adopted is a three-dimensional concept that includes:

- Social dimension which aims to satisfy human needs and respond to the aspirations of justice and social harmony.
- Economic dimension which aims to achieve economic growth and economic viability.
- Environmental dimension which aims to preserve, to improve and value the environment and natural resources, through a long-term vision.

But the real challenge of sustainable development is to establish an integrated approach to these dimensions, which can be represented by three intersecting circles, which represent a common intersection area of sustainable development.

Therefore, the concept of sustainable development requires in itself a harmonious integration between economic growth and social progress and ecosystem requirement. This integration requires the formulation of scientific knowledge with the participation of men and women in all countries that calls for the development of science, technology, scientific research and innovation, with the full participation of women.

Science and technology, in fact, play a role primarily in the areas of renewable energy, agriculture that respects the environment, ecosystem building, urban development, ecosystem pedagogy and respect for the relations of cooperation with regard to major global issues such as climate change, global warming and biological invasions.

There is no doubt that science is in constant need of advanced research, as producer of scientific knowledge and developer of technology.

This research is closely linked, in essence, to high quality education to accompany the progress in science, as much as the production of knowledge seems conditional on scientific research.

The progress of science and technological innovation inevitably provide scientific knowledge of the problems; formulates solutions and invents new technological answers.

But this progress depends on the need for the effective participation of women in the production of scientific knowledge, which requires scientific and technological training to

ensure equality of opportunity and justice, and balance in joining the areas of specialization and graduation.

This training would be fully appropriate for the necessities and needs of environmental sustainability, and conditional on scientific research, done by men and women equally. It would allow, through the implementation of elaborated ideas and the results obtained in the field and laboratory, as well as the "smart" application of information and communication technologies, to find appropriate solutions to protect biodiversity and ensure sustainable management of natural resources and natural ecosystems, increase efficiency in energy, develop clean technologies and green technology, improve the living conditions of the population, especially in the countryside, reduce poverty and control pollution and all types of risk and nuisances, and the effects of climate change, land and sea desertification.

But studies have shown that there are wide disparities between the high number of female students in Arab universities, and the degree of their involvement in scientific research, exact sciences and technical sciences. Even for those who do engage in science and scientific research, they interrupt the process of research and innovation if they get a PhD because of the family and social roles of women, in addition to the lack within the Arab universities and research centers of assisting institutions such as canteens, nurseries and kindergartens.

If we were to draw a graphic based on the rates and levels of male and female teachers -researchers in Arab universities, we would get a graph in the form of scissors, called the scissors graph or the glass ceiling; this would be for all areas of science.

In life sciences (biology), where we find the largest number of women engaged in science in some Arab universities in the rank of assistant exceeds 80% and this drops gradually to the rank of Assistant Professor and Lecturer Professor, to reach 13% in the rank of full Professor, in the best conditions, while the opposite is for men who do not exceed in the rank of assistant 20% to rise to the range of 90% in the rank of full professor.

This paradox requires the adoption of the principle of equality between men and women in the issue of the study of science and scientific research, upgrading to the highest levels of the university, in the areas of science and technology in order to use all the energies of invention and creation, benefit from the inventory of the skills of Arab women in science and innovation.

In fact, women, in terms of their social role in education, health care, and care for others, transmission of culture to future generations, and preservation of a proper milieu, are seen as carriers and protectors of peace and the environment.

In this case, women's full participation in scientific and technological areas, will allow not only for an increase in the scientific capacity of humans for the Arab countries, reflecting, no doubt, its significant positive effects on the development process and progress, but also, give greater variety to the formulation of scientific knowledge and determination of the topics of scientific research, enabling the development of new ethical standards for science and technology.

The integration and equal integration of Arab women in science, and their contribution to the formulation of scientific and technological knowledge are, therefore, essential to reach sustainable and fair human development.

As a result, there would be no economically viable, socially equitable and ecologically cautious development without the full participation of women, on equal footing with men, in the production of scientific and technological knowledge in the process of innovation as a whole.

This equal participation of Arab women will allow the reconciliation between three vast ambitions and place them in a constructive relationship, which are:

- The development of the living environment , i.e., all the physical, chemical and biological factors to which living beings are dynamically related such as water, air, land, and subsoil.
- The development of the life style, which indicates the way of existence and living, and refers to the social behavior, including cultural issues, and where we find the important values that characterize a society and central social representations such as education, security, health, and justice among individuals, whatever generation they belong to.
- The development of the standard of living, which includes the use of the resources that surround us, the production of goods and services, and communications activities and distribution, as well as consumer markets.

Thus, the sustainable development of the Arab countries requires strengthening of the richness and diversity of science and technology with the active participation of women and men alike, because the discrimination in this area, and in all areas, is the negation of the values of sustainable development itself

Sustainable development, in the end, requires taking into account the women's vision of the priorities and objectives of development, particularly in the policies of education, science, technology, scientific research, scientific culture, communication and information, and support to these areas in a clear and concrete way.