Country Report

WOMEN IN SCIENCE AND TECHNOLOGY IN SRI LANKA

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Women in Sri Lanka entered the scientific profession during the early part of the 20th century although scientific research had been carried out since the beginning of the 19th century. Medicine was the first scientific profession followed by women. Since then, women have been qualifying in all fields of science, including engineering. The first woman science graduate qualified from the University of Ceylon in 1945 and the first woman engineer in 1958. Over two-thirds of women scientists are qualified in the biological sciences. Recently, the physical sciences have also been attracting greater numbers of women.

In the schools, more girls are channeled to arts courses and more boys to science courses. In 1984, 71.6% of arts students and 46.04% of science students in Grades 11 and 12 were girls and this distribution has remained fairly constant throughout the years.

The most striking manifestation of gender role stereotypes are apparent in the technical subjects at secondary school level. Woodwork, metal work and similar subjects are reserved for boys, while girls take up subjects such as home-science and weaving. Such differences in curricula virtually exclude women from skilled technical employment.

Enrolment data for colleges and universities can indicate whether women have access to and are directed towards careers in Science and Technology (S & T).

In Sri Lanka, women have had relatively high participation in university education. The total university enrolment for the faculties of Science, Medicine, Engineering and Agriculture for 1975/76 was 350 (30.76%) and for 1985/86 was 861 (35.77%), thus showing a definite increase in the ten-year period.

Table 1 - Enrolment of Women into University Science Faculties (Academic streams - Science, Medicine, Engineering & Agriculture)

Academic	Total	No. of Females	Percentage
1975/76	1138	350	30.76
1976/77	1278	374	29.26
1977/78	1434	382	26.64
1978/79	1704	533	31.28
1979/80	1813	620	34.19
Total	7367	2259	30.66

Source : Basic statistics on Higher Education in Sri Lanka - U.G.C. (1981)

Nearly 50% of the students admitted for Biological Sciences are women, while the percentage entering for Physical science and Engineering is about 19%. The distribution of women students by Faculties appears to have changed very little over the years. Women thus continue to be underrepresented in Engineering, Architecture and other Technology courses. Against this background, the Sri Lankan woman's choice of different areas of sciences education can be seen.

Table 2 - Classification of Students Admitted to University Science Courses (1983/84 to 1985/86)

Year of G.C.E (A.L.) Exam		1982	1983	1984
Year of Admission		1983/84	1984/85	1985/86
Academic Stream		No. admitted	No. admitted	No. admitted
Physical Science	Total	1184	1280	1061
	Female	227	234	208
	%	19.17	18.28	19.60
Biological Science	Total	1228	1324	1346
	Female	545	628	653
	%	44.38	47.43	48.51

Table 3 - Women Scientists by Qualifications 1985/86

	Diploma (Post Graduate)			Diploma (Under Graduate)			Bachelor's Degree			Master's Degree			Doctorate		
	F	T	%	F	T	%	F	T	%	F	T	%	F	T	%
Scientists	44	596	7.38	16	100	16	418	1916	21.82	103	484	21.28	59	326	18.098
Engineers	39	968	4.03	1	125	0.8	252	2984	8.44	21	320	6.56	2	73	2.74
Medical	19	60	31.67	9	34	26.47	90	223	40.36	15	59	25.42	0	1	0
Architects	3	13	23.07	2	27	7.4	42	189	22.22	10	33	30.30	6	69	8.79

Source: NARESA Computer Analysis

Table 3 shows that there is a high percentage of women with post-graduate qualifications, especially a master's degree and a much lower percentage with doctorates. There seems to be a general trend for women to participate in research and post-graduate education in the natural sciences, in contrast to their presence as a small percentage in the engineering science sector (see Table 3).

Table 4 - Women Scientists by Discipline

	Total	No. of Females	Percentage %
Natural Sciences	389	43	11.05
Agriculture	109	8	7.34
Engineering & Architecture	543	7	1.29
Medical	50	7	14.00
Social Scientists	45	2	4.44
Total	1136	67	5.89

Source: 1974 Directory of S & T Personnel in Sri Lanka

A survey of S & T Personnel in Sri Lanka conducted by the National Science Council (now the Natural Resources, Energy & Science Authority, NARESA) published in 1974 revealed that of the total of 1136 survey respondents 67 (5.89%) were women. The percentage of women was lowest in the Engineering and Architecture section, being only 1.29%.

According to the Report on the Inputs into Scientific Research in Sri Lanka, (published by NARESA in 1986) women comprise only 13% of the total S & T personnel in the country.

In proportion to the number of women scientists employed in the General Service Sector, the Productive Sector and in Higher Education, women scientists are fairly well represented in the public sector. The largest number of women are employed in the Higher Education Sector. More men seem to be employed in the private sector (see Table 5).

Table 5 - Women Scientists by Area of Employment

	Doctorate									Master's Degree								
	General Service Sector			Productive Sector			Higher Education Sector			General Service Sector			Productive Sector			Higher Education Sector		
	F	T	%	F	T	%	F	T	%	F	T	%	F	T	%	F	T	%
Scientists	13	109	11.93	4	22	18.18	42	195	21.54	80	340	23.53	1	49	2.04	22	95	23.16
Engineers	1	31	3.23	0	7	0	1	35	2.86	14	138	10.14	0	106	0	7	76	9.21
Medical	0	0	0	0	0	0	0	1	0	2	8	25	1	2	3.33	12	48	25
Architects	6	69	8.69	0	0	0	0	0	0	8	24	3.33	0	0	0	2	9	22.22

Source: NARESA Computer Analysis 1985/86

Entry of women into research was encouraged especially after the 1950's, due to the creation of many scientific research establishments. Table 6 shows the percentage of women working in the major Research Institutes in Sri Lanka. Most Institutes have between 20 to 30 percent of women scientists in their staff. The Medical Research Institute has a higher percentage of 47.37 female research workers.

Table 6 - Women in Research Institutes

Name of Research Institute	No. of Women	% of Women	Total M & F
Tea Research Institute	25	30.12	83
Coconut Research Institute	9	25.71	35
Rubber Research Institute	10	22.22	45
Agricultural Research & Training Institute	12	21.05	57
Ceylon Institute for Scientific and Industrial Research	19	32.76	58
National Aquatic Resources Agency	31	30.69	101
Medical Research Institute	9	47.37	19

Source: NARESA

To determine the role of women in policy-making roles regarding S & T, we must look beyond enrolments, degrees and participation in the work force to the placement of women in positions where they can exert influence over the process of decision-making. This is referred to as the determination of S & T equity indicators. Equity indicators are the presence of women in senior positions within research centers, universities and government departments dealing with scientific administration and science policy and the levels of these positions with regard to decision-making.

Table 7 shows that women are well represented in the Natural Resources, Energy and Science Authority (formerly the National Science Council) of Sri Lanka which is the premier national body concerned with the formulation of policies and support of scientific research programmes.

The representation of women at the highest level as members of the Board has increased gradually during the period 1973 to 1987.

Table 7 - Women Scientists in the Natural Resources, Energy & Science Authority

Year	Board Members		Directors Asst. Directors		Scientific Officers		Staff Assistants	
	W	T	W	T	W	T	W	T
1973	0	22	-	1	4	6	-	-
1978	0	15	-	3	4	7	0	1
1983	1	11	0	5	3	5	5	8
1987	2	11	2	8	1	3	2	5

Problems and Constraints

Outright discrimination between men and women in terms of pay and conditions of work is non existent in Sri Lanka.

However, a number of factors, both cultural and socio-economic limit women's opportunities in the S & T professions. For example, traditional cultural values and child-bearing and nurturing responsibilities lead many qualified women science graduates to seek teaching or desk jobs rather than go into the field. This limits their career prospects and choices. It also fuels the argument against the investment of limited governmental financial resources in women's education in S & T.

Women are faced with the dual burden in the household and in the work force and have to wrestle with the problem of coping with the combined roles of mother and career woman. This is especially so for the young married woman during those years of her life which should be the most

productive as a research scientist as well. For those who want to care for their own children but keep some sort of continuity going in their careers until the family needs less attention, the most obvious solution is part-time work. Some women graduates have found part-time work as teachers or tutors. Some prefer to take a less demanding job than their qualifications fit them for.

Further problems arise with returning to work after a relatively long gap. Particularly in S & T, there are problems in keeping up with the latest developments while not actively working in the field.

The issue of the lack of facilities in science education in many girls schools is a factor that deserves considerable attention with respect to the future of women in S & T in Sri Lanka. Disparities in the facilities and resources available for, and the standard of, teaching of science in girls' educational institutes are often seen as compared to those of boys' schools. The necessity of adequate resources to train women teachers in S & T is an urgent issue.

In many schools, only very bright girls are encouraged to opt for the physical sciences. In general, women are more often enrolled in education, medical and health services, etc. This pattern exists in developed and developing countries alike. The underrepresentation of women in the fields of Engineering, Physical Sciences and other Technology areas have had severe repercussions affecting women's needs. As a result, in many instances, technological developments and the choice of technologies have negatively affected women. Many technological developments in the areas of agriculture, industry and fisheries, etc, have resulted in the marginalization of women's traditional skills and displacement from traditional sources of work and income without compensating access to new technology. In some cases, new technologies have exploited women as sources of cheap labour. Research and development (R & D) in S & T have not adequately addressed the needs of women, particularly poor women. Therefore, the introduction of a woman scientist's viewpoint into discussions of technology should be regarded as essential in all S & T decision-making and policy-making bodies.

Present Needs

In order to determine what equity in science education for men and women means, we would need to know whether

(a) comparable educational facilities in S &,T are available to both sexes and
(b) the outcome of the training - do they persist to the degree?

The study of the adverse impact that development has had on woman is another important area for examining issues in S & T for their relevance to women. Several possible technologies can be developed and policies considered that would counteract trends with potentially adverse consequences to women.

Since engineering and other technology subjects are the most male-dominated areas, special policies are needed to encourage women in engineering studies and professions.

There is a serious lack of data and statistics to further assess the placement of women in the areas of S & T.
Data is needed in many areas, such as:-

(1) The presence of women in senior positions in those bodies dealing with decision-making and in the universities.
(2) The presence of women in high position in bodies which regulate resource allocation for scientific research.
(3) Data on publication rates of women. Studies of scientists' research performance is gauged by their publishing productivity and the extent to which scientists publish is of major consequence to their careers. The effect of marriage and children on publishing acitivities of women scientists should be assessed. Uptodate no information on the publishing activities of women within the country is available.

Lastly, the actual and potential role of women scientists and engineers needs to be emphasized. The linkages between women scientists and women's lobbies, policy-makers and policy analysts need to be developed and strengthened.

Recommendations for the Future

1. In order to determine the progress of women in S & T, data & statistics should be collected. The collection of data should be regularly continued and constantly monitored.
2. R & D serving women's needs should be given high priority. Conscious policies should be adopted to promote R & D in S & T aimed at relieving women from time and energy-consuming and unproductive work, meeting their health needs and promoting their quality of life.
3. Increased participation of women scientists and engineers in decision-making regarding R & D. This can be effected in a number of ways such as including women in advisory committees, task-forces and commissions that make decisions regarding R & D and development policies.
4. Increased contact between women scientists and women's organizations should be encouraged to promote better understanding of the various issues, concerns and constraints related to both groups.
5. Efforts should be made to disseminate S & T information through channels of communication that have proved effective in reaching women.
6. The promotion of joint-technology related projects between S & T institutions and groups of urban and rural women should be undertaken.
7. The participation of girls and women in existing technical training and vocational training programmes.
8. Opportunities should be created for women scientists and technicians to meet and discuss their training and careers with young girls, thus encouraging positive role models.
9. Integration of S & T issues into a broad frame-work that identifies women's special interests in employment, industry, agriculture, etc. The opportunities for women to participate directly in the development of national S & T policy should increase, as more women assume leading roles in S & T.

The analysis of the present status of women scientists in Sri Lanka in professional organisations and research institutions indicate., by and large, an optimistic picture of their future. The analysis also revealed the obstacles that Sri Lankan women will need to over come in order to make their mark on science and society.