

Women with Disabilities and STEM

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Introduction

The exclusion of Women with Disabilities from the global development agenda has been recognized at many forums including the United Nations. In the Secretary General's Report "Keeping the promise: realizing the Millennium Development Goals for persons with disabilities towards 2015 and beyond" it was stated that "Overall, only a few countries included women with disabilities as one of the priority target groups in the implementation of the Millennium Development Goals and other related development projects"¹ In this context we observe that though globally science and technology fields are escalating at a dramatic pace and provide a new sphere of development creating higher quality of life and independence, 15% of the global disabled population of which at least 60% are women, the majority living in rural areas are completely excluded.

For women, the stereotyping which affects their gender contributes to their exclusion. Low literacy, lower income and rare control of resources make women with disabilities disadvantaged in the field of education and employment. A continuous violence perpetuated on them contributes to their powerlessness. It is therefore being slowly recognized that there is an urgent need to include women and girls with disabilities in STEM to empower them by enhancing their educational and employment opportunities.

Science, technology and innovation are also key components of sustainable development, interwoven in the millennium development goals (MDGs). In developing countries years of indigenous knowledge conserved by women (including women with disabilities) are important parts of global heritage and a basis of the development of Science and Technology and needs to be recognized. In June 2012, Rio +20 Conference on sustainable development stated that men and women should have equal access to quality education at all levels. This includes persons with disabilities. The importance of science and technology was stipulated as central to a human-centred and inclusive economic growth model. This "missing half" in STEMs was indicated as responsible for gender equitable growth.

¹ UN Report of the Secretary-General Sixty-fifth session Item 27 (b) of the provisional agenda Social development, including questions relating to the world social situation and to youth, ageing, disabled persons and the family "Keeping the promise: realizing the Millennium Development Goals for persons with disabilities towards 2015 and beyond

Coming from a developing country with large resources, the Women with Disabilities India Network is concerned about the prevalent gap across a wide range of gendered socio-economic indicators but specifically in STEM which affects our well being.

Women in Science and Technology

Women in Science and Technology have contributed to the field despite the barriers. Two well known examples are of Temple Grandin who had autism and came to be well known as a livestock specialist . On her experience she wrote:

I can empathize easily with cattle because in many child are the same things that make cattle afraid: sudden motion, loud noises, high pitched noises and confusing distractions” (Grandin, 1994). While creating some of the best patents in livestock management which were humane she also worked with autistic children, With a grandfather who invented the automatic pilot for airplanes she grew up to like science and a teacher supported her. She went on to do her Masters and a PhD and set up the Grandin Livestock Handling Systems while teaching at various Universities (Grandin, 1999)

Nancy Rhoads an aerospace engineer at Northrop Grumman Engineering had a car accident but despite a severe disability continued to work³ .

She writes: I enjoyed the flight test programmes and found my disability to be more of hindrance in other people’s minds than it was to me”. Taking advantage of her Engineering background Nancy found method of accomplishing her goal. She writes that she enjoyed the challenge of finding a reasonable solution or alternative working.

Despite these examples women with disabilities on the whole stay out of the fields of STEM even in countries like India which provides extraordinary experiences

Science and technology globally is a 17th century phenomena but in India we can trace history back to 1000 BC. Mathematics was at a very high level and its contribution to global initiation of mathematics theories cannot be debated. The marvels of engineering can be

² Grandin, Temple in Ambrose Susan et al. 1999 Journeys of Women in Science and Engineering: No Universal Constants (Labor And Social Change). Temple University Press Philadelphia USA: 194-198

³ Nancy Rhoads Grandin, Temple in Ambrose Susan et al. 1999 Journeys of Women in Science and Engineering: No Universal Constants (Labor And Social Change). Temple University Press Philadelphia USA: 314-318

found in the Harappa and Mohenjadro Valley (2600 BC). This large canvas across time and space does not reflect women's place. Even if there was equality the deterioration of women's status in India by 500 BC was obvious. In the writings of epics women with disabilities epitomized the evil (Kaikayi in Ramayana). Though education was an important part of the life of people (Gurukals or places of education) included women but no information on women with disabilities is available.

Existing Policy and Legislation in India

India has signed and ratified both the UNCRPD (2007) & CEDAW (1993). There is constitutional provision of gender equality. However none of the Disability Laws include women's rights.

The Right To Education Act 2009, though talking of girl children has not recognised the multiple discrimination experienced by girl children with disabilities and has specific mention of girl children with disability in the law as well as in the rules to the Act. Policies on education are also silent on the coverage and the focus to be accorded to girls and students with disabilities within the education system.

Under the skill development programme of the Ministry of Labour and Employment off the 20 vocational rehabilitation centres running across the country 2 centres are run specifically for women with disabilities though no clear data on the number of women with disabilities benefited is mentioned.

The Persons With Disabilities Act, 1995 provides for 3% reservation in employment in the establishments of Government of India, State Governments and Public Sector Undertakings (PSUs) against identified posts. The status of reservation for Government in various Ministries/ Departments against identified posts in Group A, B, C & D is 3.07%, 4.41%, 3.76% and 3.18% respectively.

Implementation of Policies

Within the school system Science and Mathematics is provided for all students till High School. Computer education is increasingly been provided in most schools. This means that all women with disabilities have access to science, mathematics and computer education.

Though Right to Education provides education to all in principle it is not converted to in terms of implementation of policies.

The legal framework does not work as expected as existing data shows. Women and girls with disabilities fare less well in the Indian educational arena than either males with disabilities or women in general. The Indian census (2001) states that only 37% and Sarva Shiksha Abhiyan suggests that 30% of the out of school girls are those with disabilities.

Studies done by NGOs give the following picture:

According to a survey conducted by Association of Women with Disabilities published in 2008⁴, illiteracy among girls with disabilities was found to be as high as 70.9% in Jharkhand, 63.8% in Bihar, 46.1% in West Bengal, 41.7% in Orissa, and 32.5% in Assam. The corresponding illiteracy figures for women in general in these states was 60.62% in Jharkhand, 66.43% in Bihar, 39.78% in West Bengal, 49.5% in Orissa, and 43.97% in Assam. This meant that the number of girl's accessing education related to science and technology was limited. A similar result has been observed in a research study "Status of Employment of Women with Disabilities in Tamil Nadu" conducted by Tejas, a Self Advocacy Group of Disabled Women- Chennai in 2008. As per the study more than 60% of women with disabilities has education level only upto primary education, which according to the study from 0 to 5th class⁵.

Lowest educational enrolment and attainment is of children with multiple disabilities, intellectual disabilities, speech and hearing disabilities. A paper on Women with Disabilities Published by The National Trust also provides evidence that girls with disabilities are less likely to attend schools compared to boys with disabilities⁶. The reasons are, communication barriers and absence of a congenial learning environment.

A major reason in school drop out is taht women from rural schools in find either there are no toilets or if any they are inaccessible so girls get urinary infection and cannot change when menstruating⁷. Lack of sign language teachers results in illiteracy as Government has only one recognized sign language institute at national level. This also increases burden of sign

⁴ <http://infochangeindia.org/disabilities/news/survey-finds-disabled-women-doubly-disadvantaged.html>

⁵ <http://tejasindia.wordpress.com/>

⁶ www.thenationaltrust.co.in/.../Disability/women%20with%20disabilities.d...

⁷ CEDAW consultations by SMRC (Hyderabad 22nd February 2013)

language teachers⁸. Rural schools also lack facilities for STEM, thus leaving majority of Indian population out of the field.

The lack of education results in many women with disabilities, remaining out of vocational training as well as employment. The gateway to higher education are two exams across India the IIT and JEE. Unfortunately persons with disabilities have been denied permission to appear for them. In data collected by SMRC (2014) from one of India's largest Universities it was observed that of 2201 students admitted in Engineering, 17 were men with a disability and only 2 women with a disability.

The technology institutes (ITIs) in Odisha for instance admit only persons with physical disabilities as do medical entrances thus leaving out the majority of those with other disabilities.

In a study on employment and women with disabilities it was found that of the 500 women who were interviewed only seven had a science background⁹. These included a Physiotherapist, 3 Doctors an Engineer and 2 computer operators¹⁰.

In the State of Bihar a backward State 72% of the respondents affirmed lack of literacy as the main barrier in ensuring the stipulated 3% reservation quota¹¹.

There is also the infantilizing and sexual harassment at workplace (CEDAW consultations 2013 Bengaluru). Patriarchy is still an important indicator in women's exclusion from employment. A family with two sisters and a brother have a hearing disability in Srinagar.

⁸ Ibid (Chennai 6th February 2013 and Hyderabad 22nd February 2013)

⁹ Society for Disability and Rehabilitation Studies Employment Rights of Disabled Women in India : A Study of Compliance & Impact of the PDA with Special Reference to UP, Rajasthan, Bihar, Maharashtra and Tamil Nadu. National Commission for Women New Delhi: 24

¹⁰ Ibid: 25-26

¹¹ Ibid:37

The two girls are educated but have been denied jobs wherever they applied. The brother has a job¹².

The Silver Lining

India's Information and Technology (IT) making it rich and companies like Infosys and Wipro are spread all over the world. According to a NASSCOM- Deloitte survey 64% of IT/ITES companies employ persons with disability¹³. Companies are also making efforts to create a suitable working environment by making workplaces more accessible, arranging transportation and sensitising employees. Small IT companies like Mphasis make special efforts to train and employ (not necessarily technology background). Their employing a woman with a disability Meenu Bhambani has made all the difference in employing persons with disabilities. Project Communicate, a training programme for persons with disabilities jointly by Mphasis, Diversity & Equal Opportunity Centre (DEOC) and the Association of People with Disability (APD). Project Communicate trains candidates to be "industry ready" with the skills required for a successful career in ITES. All IT companies have gender equal policies, but no survey has been carried out on the percentage of women vs men employed by them.

An outstanding example of employment of women with disabilities is an IT Company. Vindhya E-Infomedia, Bangalore, says: "Vindhya is a company in which 90% of its employees are disabled" says its Managing Director Pavithra Y S. Founded in the year 2006 with the vision of creating a profitable organization which will also create social impact it has 220 employees of which 90% are persons with disabilities. Of these 95% are Women with disabilities. The company does not deal only with the urban sector but goes to rural areas to pick up women who have a school or college degree. It is not a non-profit organization for its triple bottom line is—people, planet, and profits. The productivity and quality of women disabled employees has never been an issue according to the company.

In conclusion STEM adds value to women's existing knowledge and contributes also to an equal utilization of the world's resources. For instance WWD have problems of food security but at the same time are producers. Knowledge gained through STEM would contribute to increased national food productivity and thereby economic growth. By accessing STEM, WWD can contribute to the workforce by inclusion in the State's scientific community as

¹² CEDAW consultations by SMRC (Srinagar 11 May 2013)

¹³ <http://www.nasscom.in/nasscomdeloitte-release-study-enterprise-mobility?fg=235321>

well as incorporation in the rural sectors. The former would enable the promotion of research and in the second by implementation in the field. It would enable the positive impact of resource utilization at its best and on the other hand produce a workforce of women scientists empowered to critically challenge their exclusion.

Recommendations

1. The achievement of MGDs requires the support of the UN System in this case specifically UNIDO, UNDP, ILO and UN Women with regard to research and creating awareness through usage of STEM
2. Disaggregated data based on gender and disability
3. Initiating review of policies on education from the lens of the rights of women with disabilities as mandated by the UNCPRD and CEDAW.
4. Allocate specific and adequate amount of financial resources towards implementation of STEM
5. Transport costs, scholarships, etc. may be encouraged. They serve as effective incentives by
6. Reducing financial costs of to families and check drop out.
7. Reasonable accommodation in infrastructure, working conditions, communication etc. to ensure accessibility of WWDs.
8. Specific mechanisms to address harassment faced at work by WwDs.
9. States should be mandated to formulate special schemes for training and skill development related to STEM