

STATUS OF WOMEN IN INDIAN SOCIETY – ISSUES & CHALLENGES IN PROCESSES OF EMPOWERMENT

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The status of women in any civilization shows the stage of evolution at which, the civilization has arrived. The term 'status' includes not only personal and proprietary rights but also duties, liabilities and disabilities. In the case of a Indian woman, it means her personal rights, proprietary rights, her duties, liabilities and disabilities vis-a-vis the society and her family members.

With regard to the status of women in Indian society at large, no nation has held their women in higher esteem than the Hindus. Perhaps, no other literature has presented a more admirable type of woman character than Sita, Maitriya, Gargi. The Indian civilization has produced great women ranging from Brahmavadinis (lady Rishi) to states woman, from ideal wife to warrior queen. It dates back to thousands of years. Hindu mythology witnesses that the status of Hindu woman during the vedic period was honorable & respectable. The marriage was regarded as sacrosanct and the family ideal was high. The woman on marriage acquired an honorable position and considerable status. There are references, which indicate that, equal social and religious status was allowed to boys and girls in Vedic society. Boys and girls had equal opportunity for advanced education. The girls also spent early years of their life in brahmacharya ashram after observing Upanyana Sanskara for study of Vedas. It was thought necessary for girls otherwise automatically they would be reduced to status of Shudras. They could quit before recommended period of brahmacharya ashram as they were married at 16/17 years of age. They were then called Sadyovahas. If she continued her studies, she was called Brahmavadini.

Attainment of women in intellectual field is to be inferred from the fact that some of the hymns are attributed to female Rishis. They were on the same footing as men. They learnt the Vedas, were entitled to recite the

Vedas and they were teachers as well as learners. They were poetesses, teachers and intellectuals of the day.

Marriage was an established Institution in the Vedic Age. It was regarded as a social & religious duty-, it was not taken as a contract. The husband-wife stood on equal footing and prayed for long lasting love and friendship. There was no tradition of child marriage prevailing in Vedic society. Wishes and choices of girls in the settlement of their marriage are also a strong indication of their status in society. The bride had the right of selecting her own consort. This custom was known as Svayamvara - Self-choice. Monogamy normally prevailed in Vedic age and this indicates high status of women in this period. Widows were allowed to remarry if they so desired.

In the Vedic era, women had sufficient freedom of going to attend fairs, festivals, and assemblies. They were not confined to four walls of their family houses. There is no mention of Purdah system

The strong cultural background of Indian society and high status of women kept them healthy from all perspectives - social, physical and psychological.

During the post-vedic period, women started losing the status in society, which she attained in the Vedic age. She lost her independence. She became a subject of protection. Manu, the progenitor of Hindu race, stated that a woman should be kept day & night in subordination by males of the family - woman has to be protected by her father in childhood, by her husband in young age and by the sons in old age. She lost her identity after marriage.

Manu's codes are legal authority of the time with respect to Hindu family. He regards daughters as an object of highest tenderness. He did not treat women at par with man so far as rituals of Vedas are concerned. The woman was not eligible for the study of Vedas, nor for use of mantras in performing sacraments except marriage

Serving to husband is equivalent to living in the house of teacher, household duties amount to yagna for her. Manu believed that there is vital structural difference between man and woman, each suited for different type of work. He regards women as more emotional and less rational by nature than man; does not possess much depth of reason.

Man was responsible for hard work, earning the bread and women for household duties. Manu says, "when creating them, God allotted to woman a love of their bed, of their seat, and of ornaments, impure desires, wrath, dishonesty, mature and bad conduct. That is why Manu does not contemplate equality between man and woman in different walks of life. He has however, made contradictory statements. At one point, Manu has said, "Woman should be honored and adored by fathers and brothers, by husbands and also by brother-in-law. Where women are honored the Gods rejoice, but when they are neglected, all rites and ceremonies are fruitless".

Women were pre-ordained for procreation and they had no other function. Manu was of the opinion that women do not need any education. Marriage of girls forms their Initiation into study of Vedas.

Marriages were settled soon after puberty. The institution of caste became very rigid with strict hierarchical gradations. Brahmanical order was firmly established. Manu did not favor inter-caste marriages. Polygamy and Monogamy was prevalent. Brahmans could possess 3 wives, Kshatriyas - 2, Vaishyas - 1 besides 1 Shudra wife for all, only for pleasure and not for religious rites. Evidences of widow re-marriage during this period are conflicting; there are cases of permission as well as of prohibition. A widow was generally not allowed to re-marry. Women were incapable of possessing property.

Manu regards the wife as the half of her husband though not better half. According to Manu, man does not make a whole by himself alone but attains completion in the company of his wife. Manu wanted that women should not only be honored, she should not be put to any grief. However, he insisted that a husband should be constantly worshipped (even if he was not a ideal husband) as God by a faithful wife. By violating her duty

towards her husband, a wife is disgraced in this world or is tormented by diseases as punishment for her sin. The birth of a son has been very important from worldly, religious and spiritual point of view. Birth of a son was necessary to pay off the debt to ancestors. Putra signifies one who saves a person from hell.

During the Moghul rule, the socioeconomic status of Hindu women were very much lowered and had to depend on the Hindu male in every activity. The social evils like Purdah System came into force. Child marriage was prevalent. Lack of education, early marriage, non-existence of employment opportunities, absence of absolute property rights were main causes of inequality of sex in the socio-economic field. Economic dependence made a Hindu Woman socially backward. Incidence of female infanticide and custom of Sati could be witnessed.

The women came to be regarded as of the same status as the Sudras. Girls were to get married before puberty; the age of 8 was regarded as ideal. Early marriage was followed by early maternity, which increased mortality among women.

During the British rule in India, legislation was used to bring about significant modifications in the structure of society. Various reforms were initiated with respect to status of women. Free India has carried forward the process to a point where legally at least men and women are equal. However, some of the basic cultural orientations towards men and women in contemporary Indian society have been shaped by the authority of classical texts, teachings of religion, factors of historical development and the persistence of regional and local traditions.

The contradictory attitudes expressed about women in classical texts persist in contemporary society. On the one hand, they are regarded as the highest embodiment of purity and power - a symbol of religiousness and spirituality, on the other; they are viewed essentially as weak and dependent creatures requiring constant guidance and protection. While girls are also considered necessary, the birth of a boy has been considered more desirable.

Ritual considerations materially add to the desirability of the male. In the traditional scheme of Hindu life, the attainment of salvation occupies the place of highest importance. For this it is necessary to complete all the rites ceremonies of the life cycle prescribed by dharma. In the patrilineal Hindu society, only a male can offer water to the spirits of the deceased ancestors; a son alone can perform the essential rites ensuring passage to heaven or attainment of salvation. This makes a male off-spring very desirable.

It is believed, parents can depend on sons for support in old age and are looked upon as potential builders of family prestige and prosperity. On the contrary, daughters are considered to be destined for others, their upbringing is all worry and work for the parents. The difficulties and expenses involved in her upbringing and marriage further detract from her desirability. Even today in a large number of Hindu households, the birth of son is an occasion for rejoicing; the birth of a daughter is a cause for anxiety. (Vashishta, 1976).

The assumption of superiority of males has built up the ideas of male dominance and female dependence. Most of the major decisions - making roles are thus the domain of man in most cases.

These cultural attributes have left a deep mark on women's development in India; of-course it varies according to specific variables operating in Indian society such as caste, class, rural, urban, education, region and other socio-economic parameters.

In India, outside the educated elite and often even within it, girls are considered an economic liability because of the tradition that requires a girl's parents to provide her with a dowry at the time of her marriage. Indian society has had a culture of Kanyadan and Vara-dakshina where the parents offer their daughter to the bridegroom and give affectionate gifts in kind or cash with the intention of setting up the household of the new couple at the start of their life together. Also there has been the notion of streedhan, which relates to the ornaments given to the bride by her father or brother, the intention, again being to help the daughter to tide over

difficulties, if ever the situation so warranted. Over a period of time these cultural attributes became a compulsion and the whole process has been commercialized. For many families, the dowry represents an enormous financial burden. The dowry system is directly linked to many harmful practices against women and girls in India, including burning of brides over dowry disputes.

Because of the perception that girls are a drain on family resources, in some cases i.e. depending on the socio-economic parameters, families are unwilling to invest in daughters. Male children are breastfed longer and receive more and better food and more timely and costly healthcare than their female siblings. Girls with older sisters appear at a particular disadvantage. Higher childhood mortality among girls is primarily responsible for the skewed sex ratio in the Indian population. The sex ratio varies greatly on a state-by-state basis, which reflects differences in female literacy and other indicators of women's status.

Female infanticide and female foeticide play a substantial role in the lop sided sex ratio in India. Poor families in certain regions sometimes resort to killing baby girls at birth-usually second and subsequent daughters - to avoid an unwanted burden on family resources.

Sex selective abortion has also been common. Amniocentesis, a technology to detect any foetal abnormality, has been used for determining the sex of fetus and the selective abortion of female fetuses has been widespread cutting across various societal parameters.

Higher levels of female education are strongly related to increased age at marriage, knowledge and practice of contraception and smaller family size. Culturally, Goddess of learning Saraswati is revered and worshipped by all in the society but families from lower socio-economic group are often reluctant to Invest in their daughter's education. Literacy remains low among women compared to men. The gender gap in education is far greater in the northern states. Even in states where enrollment rates for girls are higher, many girls drop out of school after only a few years of education. Cultural factors such as inhibition on education being imparted

by male teachers to girls once they reach puberty, is responsible for drop-outs.

Early marriage and childbirth continue to be the social norm in India, these cultural compulsions are more pronounced in families of lower socio-economic status though sometimes middle class families reflect the same phenomena. Within the context of specific variables such as socio-economic status, caste, tribal group, region, education and such differentials, after marriage, a woman is under the authority of her mother-in-law and generally has little autonomy in decision making, even regarding her own fertility. Some of them live in physical seclusion or Purdah. Their isolation and limited freedom of movement contribute to their dependence and restrict their access to family planning information and services. (Conly and Camp, 1992).

Women derive their status primarily from their child bearing role and their value is often measured by the number of sons they have. Women themselves depend on male children for social status and economic security and are often reluctant to use contraception prior to having a son. Family planning practice rises significantly among women who have two or more sons. The cultural practice of woman eating last in the family takes a toll on her health if it is a household of low economic status

The most direct effects of poor health and nutrition among females in Indian society are high mortality rates among young children and women of child bearing age and morbidity rates throughout the life cycle. The effects of pervasive ill health extend beyond the woman herself. A woman's health and nutritional status influence her newborn's birth weight and chances of survival, her capacity to nurse and nurture her child and her ability to provide food and care for the family members.

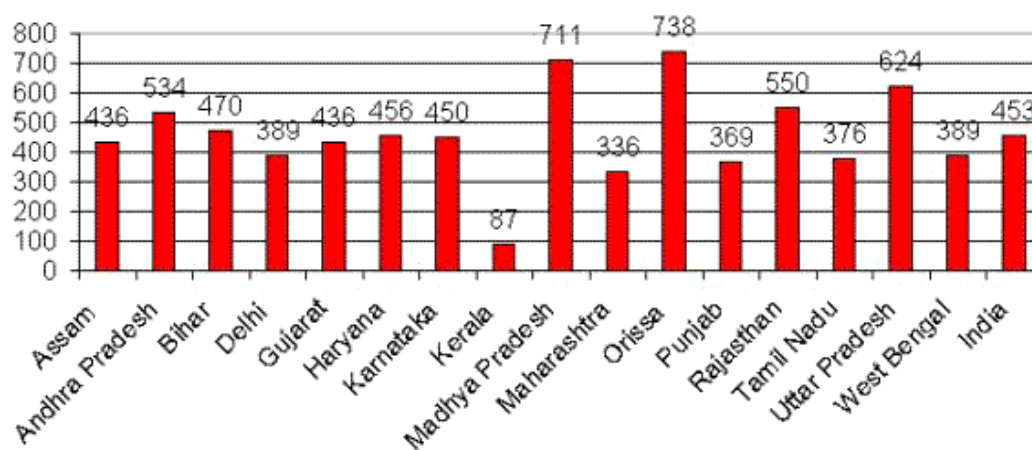
Post neo-natal deaths are generally caused by infectious diseases. The incidence and severity of most of these diseases are affected by controllable factors such as immunization, health care and nutrition. Where gender bias exists, these factors are not controlled equally for male and female children.

Maternal mortality in India estimated at 437 maternal deaths per 100,000 live births, results primarily from infection, hemorrhage, obstructed labour, abortion and anemia (The World Bank, 1996). Lack of appropriate care during pregnancy and childbirth, utilizing the services of Dais or untrained mid-wives, lack of motivation on part of family members to take medical advice from doctors for the women in question, explain most of the maternal deaths.

DIRECT EFFECTS OF POOR HEALTH ON WOMEN

Maternal mortality rates

(Source: MACROSCAN, Women in India: A Status Report 2002)



Malnourished women are more likely to give birth to low birth-weight babies, and if the underweight baby is a female who survives, she in turn is likely to continue to be undernourished throughout her childhood, adolescence and adult life. This lack of nourishment has detrimental effects on her reproductive and lactating capacities and overall development.

Family has been considered to be like social security in Indian society. It has been a cultural norm to take care of the elderly. However, breaking up of the traditional joint family system and erosion of social values has made the elderly women vulnerable to some extent with respect to low health status. They may suffer from neglect, loneliness, alienation, poor nutrition apart from physical ailments (Puri and Khanna, 1999).

The post independence period has seen a number of positive and concerted efforts by the Government to improve the socio-economic status of

women. The process had set in much earlier with efforts of social reformers in the abolition of the Sati Systems. After independence, attainment of equal status for women in every sphere of life was enshrined as one of the main objectives of the Indian Constitution. Women, who number 498.7 million according to 2001 census, represent 48.2 % of country's population of 1,027.01 million (Manorama Year Book, 2002)

Right from the First Five Year Plan the issue of providing equal status to women has been sharply focused in the development process. While the first four plans focused on organizing various welfare activities and giving priority to women's education, the Fifth and Sixth Plans witnessed a shift in approach from welfare to overall development of women with a three pronged thrust on health, education and employment of women. The Seventh Plan laid stress on efforts to identify and promote beneficiary oriented programme with the intention of extending direct benefits to women. The Eight Plan made a significant shift from 'development' to 'women's empowerment'. It recommended 30 per cent reservation for women at all levels of government. The strategy of women's component plan in the Ninth Plan provides for ensuring that a minimum of 30 percent of benefits or funds flow to women from all ministries and departments. Some positive indicators of women's development can be seen in the female literacy rate, which rose from 8% in 1947 to 54%, in the 2001 census. Similarly, life expectancy rose from 40.6 years in 1961-71 to 58.1 years during 1981-91 and to 64.9 years in 2001(India, 2002). The total fertility rate has come down from 5.97 in 1951-1961 to 3.3 in 1997 and to 2.97 in 2001 signaling a comparatively greater acceptance of family planning and late marriage norms. Women's presence in Parliament has increased from 4% in 1952 to 8.9% in 2001. This is not very significant. However, at the village and the district levels, nearly one million women are heads and members of the local self-government institutions.

A study on “Rehabilitation and Socio-Economic Conditions of Special Focus Group – War Widows in the State of Rajasthan” was conducted by Humanistic Studies Group, Birla Institute Of Technology & Science (BITS), Pilani during Aug-Nov, 2001. The study was sponsored by Rajasthan State Commission for Women, Jaipur. A total of 164

respondents were interviewed from 3 districts of Rajasthan – Jhunjhunu, Sikar & Churu. The study revealed that the socio-economic status of war-widows was better than widows in general. Various supportive projects and rehabilitation programmes were sponsored for war-widows by federal and state government. (Prakash, N et al, 2001).

A survey on “Working Women: Issues & Challenges, A Case Study of Pilani, Rajasthan” was conducted by students registered in Contemporary India courses, Humanistic Studies Group at BITS, Pilani during Feb-April 2002. Respondents comprised of 90 women working at educational institutions in small town Pilani. Analysis revealed that majority of respondents felt they were economically independent, there was no gender discrimination at work place, showed high level of satisfaction towards their job, had a role to play in decision-making at home & perceived a positive change in perception of society towards women. The study also revealed that initially majority of respondents had to face opposition of family members with respect to taking up a job. (Prakash, N & CDP C332, 2003)

A study was conducted on Perception of BITS, Pilani Students Towards Role of Women in Science & Technology by students registered in Dynamics of Social Change during February-April, 2003.

The number of female candidates being admitted in BITS has been steadily increasing for the past few years. In the year 2000, 168 female candidates were given admission in BITS. The number increased to 296 in the year 2001 and it was 306 in the following year. These statistics reveal the growing interest of women in the field of Science and Technology.

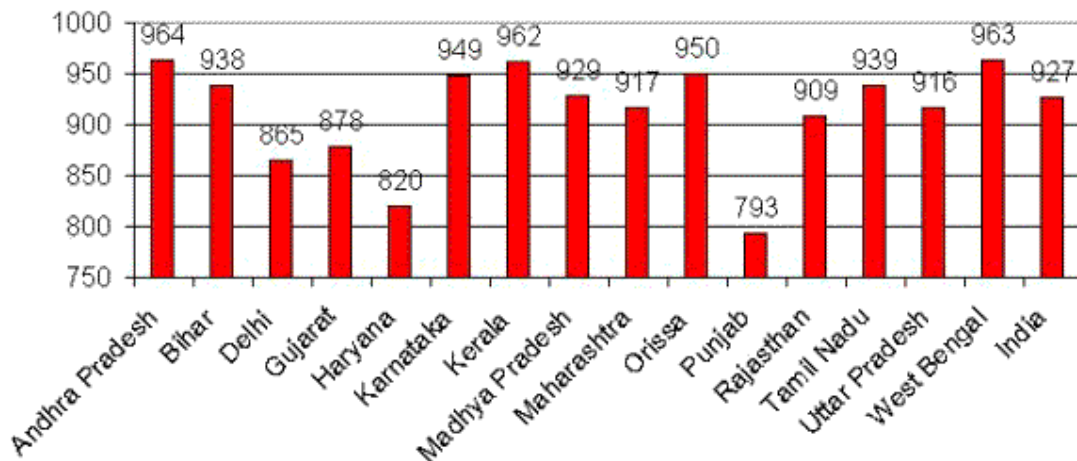
This study aims at discovering the perception of the students of BITS regarding role of women in the field of Science and Technology. Out of a total population of 2850 students, a sample of 351 was taken based on random stratified sampling technique.

Most respondents out of which most male respondents felt that women can do better in the field of human relations, we are not utilizing their potential to the fullest, enough opportunities are provided in the field of science and technology for women, women take initiatives to grab opportunities in science & technology, reservation for

women in science & technology field is not justifiable, not bothered with the gender of their bosses, women would come forward to lead a group, more importance should be given to women in science & technology field. A small percentage of respondents felt that women are inferior to men in terms of physical strength, there is lack of self-confidence in women and they give more importance to emotions often mixing family tensions with professional role.(Prakash,N & students of DYSOC,2003) While the foregoing are positive indicators, there are some disturbing trends as well. The sex-ratio in 0-6 age group which was 945 females per 1000 males in 2000 has further declined to 927 per 1000 males in 2001 indicating a bias and unhealthy use of ultrasound pre-natal test devices.

SEX-RATIO IN INDIA- SOCIOLOGICAL PERSPECTIVE

Sex-ratios for 0-6 years, 2001



According to the 1991 census, of the 324 million illiterate, 197million i.e. 61% are girls and women. According to an estimate for 1995-96, only 43.2% girls attended primary schools, 39% at middle levels and 35.3% at secondary stage signaling a considerable number of drop- outs. 32% of the total labour force in the country is female.

Women comprise 94% of the work force in the unorganized sector in the country (working in the fields, construction and other such sectors), find themselves at a loss in the organized sector. Their share in paid employment in industry and services stand at 15%. In the decision-making capacities (IAS, IFS and IPS), the number of women, though increased from 311 in 1985 to 501 in 1996, still needs to be improved. The latest figures show that in the civil services, women opt mainly for the

diplomatic services (11%) or district administration (10.5%), 3.47% of women join the police force.

While the legislative, reformative, educational, health and employment strategies have given Indian women a significant boost in their struggle for equal rights in the society, a lot is yet to be done in terms of giving them enough confidence to carry this struggle further.

The society has to change its mindset. While the legislative and other measures may trigger the process, a persuasive approach through mass communication techniques together with involvement of social and family groups will have to be worked out through collective efforts of all concerned. It calls for strengthening the ongoing process of social engineering by creating a conducive social climate through awareness and due motivation. (Kumar, 2002)

The National Population Policy, 2000 affirms the commitment of government towards voluntary and informed choice and consent of citizens while availing of reproductive health care services, and continuation of the target free approach in administering family planning services. The NPP 2000 provides a policy framework for advancing goals and prioritizing strategies during the next decade, to meet the reproductive and child health needs of the people of India. It is based on the need to address issues of child survival, maternal health and contraception, while increasing outreach and coverage of a comprehensive package of reproductive and child health services by government, industry and NGO sector, working partnership. The National Socio-Demographic Goals for 2010 are as follows:

- Address the unmet needs for basic reproductive and child health services, supplies and infrastructure.
- Make school education up to age 14 free and compulsory.
- Reduce infant mortality rate to below 30% per 1000 live births.
- Reduce maternal mortality ratio to below 100 per 1000 live births
- Promote delayed marriage for girls, not earlier than 18 and preferably after 20 years of age

- Achieve 80% institutional deliveries and 100% deliveries by trained persons,
- Achieve universal access to information/counseling and services for fertility regulation and contraception with a wide basket of choices.
- Integrate Indian Systems of Medicine in the provision of reproductive and child health services.

Programs for safe motherhood, universal immunization, child survival & oral rehydration have been combined into an Integrated Reproductive and Child Health Programme.

In the past, population programmes have tended to exclude menfolk. Gender inequalities in patriarchal societies ensure that men play a critical role in determining the education and employment of family members, age at marriage besides access to and utilization of health, nutrition and family welfare services for women and children. The active involvement of men is called for in planning families, supporting contraceptive use, helping pregnant women stay healthy, arranging skilled care during delivery, avoiding delays in seeking care, helping after the baby is born and finally being responsible fathers. The active cooperation and participation of men is vital for ensuring programme's acceptance. Currently over 97% of sterilizations are tubectomies and this manifestation of gender imbalance needs to be corrected. (UNFPA, 2001)

Women have primary responsibility for rearing children, and for ensuring sufficient resources to meet children's needs for nutrition, health care and schooling. In the rural areas of developing countries, they are also the main managers of essential household resources like clean water, fuel for cooking and heating and fodder for domestic animals. In India, women are leading rural movements to promote sustainable farming practices and resist large-scale agricultural operations that rely on intensive chemical fertilizers and pesticides. In rural India, agriculture and allied industrial sectors employ as much as 89.5% of the total female labour. Women have extensive workloads with dual responsibility for farm and household production. Their work is getting harder and more time-consuming due to ecological degradation and changing agricultural technologies and

practices. Women have an active role and extensive involvement in livestock production, forest resource use and fishery processing.

They contribute considerably to household income through farm and non-farm activities as well as through work as landless agricultural laborers. Women's work as family labour is underestimated. Deforestation has increased time and distance involved in grazing and collection of fuel and food.

(<http://www.fao.org/sd/WPdirect/WpreO108.htm>)

20 million women are directly affected because of the current drought in Rajasthan. There has been reduction in food availability because of inherent biases in food distribution as it is the women who are the first one to start skipping one meal a day. This results in glaring reduction in their hemoglobin levels and deficiency of iron, calcium and other vital components especially in pregnant and lactating mothers due to which there is a high incidence of night blindness and other ailments in women.

With support of Ford Foundation, NGOs have initiated schemes and activities to improve livelihood of urban & rural poor women with special emphasis on informal economy, developing extensive health care programs, establishing credit facilities & micro-finance (Women, Poverty & Livelihoods, The Ford Foundation, New Delhi, 2002)

Women play a key role in both land use and management. They supply inputs from the forests as fertilizer to the soil as well as fodder for the cattle, which produce fertilizer for the soil. In India, there are women-headed movements for forest protection such as Chipko. The first Chipko action took place in 1973 and over the next five years spread to many districts of the Himalaya in Uttar Pradesh. The name of the movement comes from a word meaning 'Embrace': The villagers hug the trees, saving them by interposing their bodies between them and 'contractors' axe. The chipko protests in Uttar Pradesh achieved a major victory in 1980 with a 15-year ban on green felling in the Himalayan forests of that state by order of India's then Prime Minister, Indira Gandhi. Since then, the movement has spread to all parts of the country and has generated pressure for a

natural resource policy, which is more sensitive to people's needs and ecological requirements. The chipko movement is the result of hundreds of decentralized and locally autonomous initiatives. It's leaders and activities are primarily village women, acting to save their means of subsistence and their communities.

<http://www.iisd.ca/50comm/commd6/desc/do7.htm>.

The First National Conference of Women Scientists and Technologists was organized by Department of Biotechnology on 8-9 March, 2002, in association with the Dept. of Women and Child Development and other Scientific Ministries/agencies, departments of Government of India at New Delhi.

The main conference themes were:

- Achievements of women scientists and technologists
- Career options for women in science and engineering
- Business opportunities for women scientists and engineers
- Reaching the Unreached
- Agriculture, Biology, Biotechnology and Medicine
- Nuclear Sciences, Space, Engineering, Physical and Earth Science

The discussions were organized in three main categories.

- i. Women in S&T
- ii. S&T for women.
- iii. Institutional Framework

Women in S&T

a) Jobs, Scholarships and Training:

- a. renew the contract after 5 years. Present training programme to continue for career options.
- b. Reaching the unreached programme – For higher studies at college and university level, statewise scholarships, for rural girl students
- c. Five years contractual service (at any level) with bona fide faculty/scientist status so that the entrant can write grants and conduct independent research along with hiring students and obtaining lab space from the host and participating in the host institute program. This should be taken through a proper selection procedure. There may be a provision to
- d. Increase the number of scholarships –present number is disproportionate to the number of candidates.
- e. There should be age relaxation, part time job options, flexi-timing and options for re-entry.

2. Entrepreneurship promotion for women scientists:

- a. To grant R&D status to small scale entrepreneurs so that they are not burdened by loans alone and can apply for peer reviewed grants from the ministry.
- b. Creation of an infrastructure for market research/survey, which can link market options to the women entrepreneurs.
- c. To establish nodal agencies in different geographical locations, for industry promoting bodies such as BCIL, so that their training and placement programs can be used countrywide.
- d. Database of unemployed but skilled women scientists who are looking for jobs.
- e. Database for accumulating the problems of the rural/unreached through NGOs etc, so that solutions can be worked out at the lab levels.
- f. Women scientists at premier laboratories/ retired personnel should come forward for networking of resources, information for promotion of younger women scientists, societal welfare and guidance programme for students.

S&T for Women

- a. Value addition of local specific knowledge and recognition of the innovations and developments that take place at grass root level.
- b. Convergence between the departments/ agencies and pooling the resources of Govt. / NGOs and others.
- c. Access to appropriate technologies and participation in technology development and dissemination through rural technology centres/ entrepreneurial promotions parks/ women development centres.
- d. Incentives for societal programmes with proper recognition and reward systems.
- e. Easy access to credit and marketing facilities.

Institutional Frame Work

- a. Setting up of an **Inter Agency Action Council for Reaching the Unreached for Women** – this can be with the participation of all concerned ministries and departments of the Centre.
- b. More Institutional Networking of Women in S&T at State, Centre and Academic level.
- c. Setting up of Women Empowerment Network Centres specially in States
- d. Awareness regarding S&T for women through training, counseling programmes for teachers and trainers to ensure wider dissemination of information to be done by state S&T councils.
- e. An earmarked scheme on S&T for women may be included under the budget head of State S&T Councils. [Source: <http://www.dbtindia.nic.in/women/recommendations.htm>]

For most women in urban setting, the changing corporate culture has allowed a steady rise up the ladder. A survey of women corporate executives conducted by Femina, women's magazine, across the country reveals that there is never any question of gender based ability, as long as

one is always clear that the company comes first. The respondents felt that the old attitude has changed, and that firms are willing to accept them on the basis of talent. The gender bias actually doesn't enter the picture anymore. They felt family support helped them in handling their profession amicably. (Femina, March 15, 2002).

What is required is a thorough filtering of cultural norms and biases, tackling poverty, improving literacy, enhancing awareness for role of science & technology education for girls, increasing awareness for the importance of girl child to be same as that of a male, provision of adequate family welfare services – which to a large extent is being done as a part of the government's policy for upliftment of women. Population pressure has to be tackled by voluntary adoption of a small family norm and cultural awakening is required to further enhance women's status in India.

In the context of specific societal variables, the status of women in India present a broad spectrum with gender biases leading to poor health of women & development constraints on one hand and on the other to those in the pink of health physically, socially & mentally with firm positions in the household and outside in fields of their interest including science & technology field.

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STRATEGIES FOR MOTIVATING GIRLS IN SCIENCE AND TECHNOLOGY.

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Introduction

This paper describes three strategies which have proved to be successful in motivating girls to study science, which the authors have conceptualized, developed, implemented and evaluated in classroom situations and which they would like to share with others having similar concerns. This paper gives an overview of the three strategies. The authors are very much concern about the low participation of girls in science and technology and this issue of promoting these subjects among girls in Mauritius has been a cause of concern for the authors into investigating ways to increase the intake of girls in science and technology in Mauritius. Mauritius is investing massively in the education sector, both in terms of finance and effort. It is being recognised that the economic development depends on the quality of its human resources, and education is the main provider of the manpower required. Further, the vision to make Mauritius a cyber island of the Indian Ocean Region necessitates a more pronounced emphasis on science and technology with a view to enhancing the quality of teaching and learning in our schools.

The statistics from the Mauritius Examination Syndicate, over the years have shown that around 12% of girls are taking up science and technology at higher levels, although most of them do so at the lower levels in secondary schools. To cite one example, in the 2000-2003 cohorts of B.Ed students at the M.I.E, only one out of 16 is a female student. Ramma (2000) reported that although much fewer girls than boys take up physics at H.S.C level, girls performed better than boys.

There is sufficient research findings that shows that there is a serious negative attitude among schoolgirls in most science subjects. The funnel metaphor model (Cronin & Roger, 1999) clearly illustrates the female under-representation pattern, which confirms the low rate of female pursuing education in the domain of science generally. Murphy and Beggs (1993) reported that there is concern over the low level of uptake of science by post-16 students for nearly half a century. They reported that several research have indicated that part of the reasons for this has been that children are 'turned off' from science at an early age (between the age of 9 to 14), although they

retained positive attitude towards science generally and they acknowledge its importance in everyday life.

An overview of the three strategies are given below.

Strategy 1: Gender-Friendly ,Related to everyday life and local Context Curriculum Resource Materials

A Commonwealth Secretariat project undertaken in Mauritius from January to June 2003 found that when resource materials were developed in terms of gender-friendly, related to everyday life and the local context, for pupils at the lower secondary level, both pupils and teachers found the initiative most rewarding and welcoming. The materials were developed by local practising teachers guided by faculty members of the Mauritius Institute of Education, using a template developed for that purpose. The materials were piloted, modified and implemented in 12 schools. The data were collected from different sources; questionnaires were administered to teachers; classroom observations; interviews with faculty members and group interview with students.

It was found that the pupils were very much interested and motivated during the process of implementation. This was especially true for girls and low ability pupils of both sexes. There is no doubt whatsoever that science and technology can be made more accessible to girls and even boys if efforts are directed to make the subjects more practical, down to earth and less theoretical and less content driven as revealed in the findings. The content-driven nature of the science curriculum, the perceived difficulty of school science and ineffective science teaching at secondary level were some of the issues that came out from the project findings.

Research findings in Mauritius further indicate that girls' enrolment in science, and especially physics, as a subject at Higher School Certificate Level, is equally declining. This also true for design and technology where an insignificant number of girls are enrolled. Research shows that many factors are attributed to the low enrolment of girls in science subjects as well as in technical subjects. These factors have been shown to range from social, cultural to the perception that science and technology are boys' subject and that they are difficult subjects.

Strategy 2: Acquisition of Conceptual Knowledge through integration across the curriculum

The authors' concern with improving the teaching and learning of science and technology led them to investigate another factor -whether girls face learning difficulties in the domain of logico-mathematical understanding thus causing their inability to:

- (a) Understand mathematical instructions
- (b) Understand physics and design and technology instructions pertaining to critical thinking
- (c) Develop skills to integrate mathematics and physics instructions
- (d) Apply knowledge and skills of mathematics and physics in problem solving situations.

Parmessur et al (2002) pointed out facilitating the acquisition of conceptual development among learners is an ongoing concern among educationists and researchers. The authors argue that based on the notion of propositional knowledge it may be assumed that any particular form of knowledge is governed by the pre-defined criteria. Each form of knowledge has known concepts that are embodied by meanings that are known to be true propositions. These propositions had their own criteria for verification of their truths. Furthermore, the authors argue that mathematics and physics and design and technology are distinct fields of study that are taught in schools and yet there is very little integration of knowledge between these different fields of study. As far as teaching is concerned, there is a need to foster and improve the acquisition of conceptual knowledge by linking areas of learning across the curriculum. The research undertaken by the authors of the study shows instructional and pedagogical evidence between mathematics, physics and design and technology. The study was carried out in two phases. The following methods were used in both phases:

- (a) an analysis of mathematical linkage with physics
- (b) semi-structured interview with a sample of nine girls
- (c) teaching of the concept of centripetal acceleration
- (d) evaluation of teaching and learning

An analysis of the Higher School syllabus in physics, mathematics and design and technology was carried out to identify those concepts which are inter-related. A

concept mapping of a few concepts which are found to be difficult by students were developed and the linkages between the different subjects were made, for example, students at HSC level find it difficult to understand how an object during circular motion experiences acceleration towards the centre of the circle. The process of vector analysis was chosen to be the most appropriate one as this model engages the pupils into logical reasoning and critical thinking.

Strategy 3: The Comprehensive Instrumentation Process. (CIP)

The study carried out by the researchers introduces a new strategy in the assessment of students' acquisition of knowledge and skills in physics. The purpose of this study was to find out how the quality of teaching and learning could be improved by the development of a comprehensive instrumentation process related to classroom evaluation procedures.

In order to continuously challenge the pre-existing knowledge of pupils, the CIP model provides a tool for teachers to increase the participation of the pupils, especially girls in the teaching-learning process. This ultimately lead to want to know further on these ideas or pre-conception (mis-conception). The six stages involved in this model are (1) Conceptual process evaluation (2) Procedural process evaluation (3) Analytical process evaluation (4) Experiential process evaluation (5) Conclusive process evaluation and (6) Summary process evaluation.

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WOMEN IN SCIENCE IN HIGHER EDUCATION – PARTICIPATION, PROGRESS AND EQUITY?

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Abstract

There has long been a world-wide concern about women's non-participation in science, engineering and technology (SET) in Higher Education. For at least 30 years science educators in the UK have worked hard at increasing the participation rate of young women and it would seem that they have been quite successful. At undergraduate level generally women are now as likely to study science as men but beyond that women are lost from the academic pipeline at a much greater rate than men. Consequently academe is continually seeking appropriate interventions, strategies and changes to practice in order to attract and retain women scientists. This paper reports findings from two complementary studies. The first, following a 'lifeline' interview method, documents the educational and career experiences of women physicists in the UK. It identifies barriers and constraints met by these women during their science careers. The second study, using data from questionnaires and on-line discussions, explores aspects of women's careers in science in HE through the experiences of part-time staff in the Open University. This study was a contribution to the UK's Athena Project, a national drive to improve the recruitment, retention and progress of women in SET in HE. Some of the findings demonstrate how, through its flexible employment patterns, by restoring women's confidence in their abilities and by actively developing women's careers in HE, the OU helps to retain women who might otherwise have been lost to HE careers in science through the so-called 'leaky pipeline'.

Introduction

Over the last four years in the UK a project called Athena (1) has been modestly funded to explore and support intervention strategies to increase retention and promotion of women in SET careers in the Higher Education sector. Why should such a project be necessary? Despite the fact that the number of women successfully studying science at higher education level and entering the scientific workforce continues to increase women are still not making the headway with careers that we might expect. This appears to be true generally in SET employment not just in academic science. In an analysis of general employment data Fielding and Glover (2) show that “...female SET graduates are considerably more likely than their male counterparts to make little direct use of their qualifications, to go into school teaching both as new graduates and as returners, and to be overqualified for their jobs.” Detailed statistics of employment, retention and career progression across all employment sectors are hard to find but academic science gives a well-known picture. Take Physics for instance. A much greater proportion of women are concentrated in junior positions while fewer and fewer women gain senior academic posts. In 2000 about 15% of junior researchers were women, about 9% of lecturers and 2.7% of professors. This suggests that HE loses female academics who should presumably be progressing through the ranks. In 1998 a survey of members of the Institute of

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Physics (3) showed that, more generally across physics-related careers, women members only represent 3% of top management (compared with 12% for men), 15% of senior management (35% for men) and 50% were in junior positions compared with 37% of men. This despite that fact that, for some years, more than a third of all Mathematical and Physical Science graduates entering full-time employment have been women. The situation is much the same in Chemistry (4). Why do these women 'leak' from the career pipeline and what might be done to encourage them to remain? This paper reports on some outcomes of two studies which suggest some areas for positive action in the retention and progression of women in science.

Perceptions of career progress

This study used a qualitative methodology, a 'lifeline' interview technique. This was felt appropriate in order to uncover the issues and factors that influenced the participants' journey through education and different stages of their careers. During the first phase we interviewed women PhDs in different areas of physics, of varying ages, and with broad categories of career patterns.(5) The interviews were semi-structured around certain broad areas of interest : family background; educational experiences both secondary and in higher education; teacher and parent attitudes, expectations and support; postgraduate atmosphere; culture at university and at work; influence of senior women; mentoring and support structures; interaction with peers; and the combination of family life and scientific career. In the second phase we interviewed a larger group of young women with physics PhDs using a similar interview schedule but here exploring how they felt about their future careers. (6) Analysing the stories the older women had to tell revealed constraints and difficulties in themes – of isolation, departmental culture and workplace atmosphere, discriminatory practices and harassment, and of compromises – which recurred throughout their education and careers.

Isolation, culture and atmosphere

Given the extreme minority situation in which these women, particularly the older ones, had usually found themselves, it was not surprising to find isolation a recurring theme. Feelings of isolation and of not belonging or fitting in often seemed related to what we identified as departmental culture and the way other people behaved within it. Sometimes women had found ways of using isolation as a spur or to their advantage in some way but as a protective, surviving response. The older women had

often found it difficult to understand the cultures they found themselves working in or to appreciate that things could be different. They felt excluded from the networks (the men's 'clubs') and these were the only working environments they had known. The younger women recognised what they described as the 'lads' culture, socially, which they felt they had to be part of in order to progress their work and be part of the team. They perceived the professional male scientific culture as being confrontational, self-confident and sharing of new ideas amongst themselves. They also saw science as very much an 'old boys club' and did not see much hope of changing that significantly. The presence of more women in the workplace or laboratory was generally felt to change the 'male' atmosphere and be helpful. But if the more senior women were not perceived as excellent teachers or supervisors, or did not appear interested in encouraging other women to follow a similar career path, their presence had a disproportionately negative effect. Good role models were described as women who managed to combine their working and family lives efficiently and were felt to be more effective in the time they spent in the lab. than some men who worked very long hours.

Discrimination and harassment

The older women reported these attitudes and difficulties at all stages of their careers. Harassment, both overt and covert, quite often in the form of public belittlement or forms of bullying, was often commented on and seems related to both isolation and departmental culture. Among the younger women reports of direct harassment were rare, perhaps a sign of positive effects of employment and equal opportunity legislation. Here some women mentioned technicians' attitudes and the culture in technicians' workspaces and also difficulties with men from countries outside the UK who had more stereotypical views of women. They did however report a variety of subtle, and not so subtle, discriminatory practices many of which were probably far from intentional but nonetheless have an effect. Women PhD students mentioned that the allocation of projects was not always influenced by appropriate factors and they observed that men and women are often treated differently when things do not work out in the lab. Older male colleagues (aged 50+) were sometimes perceived as having stereotyped attitudes to younger women postgraduates and employees. Many of the young women, who had male supervisors or line managers, felt that their managers were supportive and gave them helpful career advice and opportunities for

development. However the women often accepted this support as somehow being a privilege rather than an entitlement.

Compromises

Compromise is a theme that becomes strongly evident as women move on from education to employment and start to establish themselves on a career path and is, of course, bound up with relationship and family commitments. This issue is not exclusive to careers in science but it is acknowledged that the post-doctoral fellow route to a career is a difficult one for women and that research scientists lose considerable ground, in the system as it currently works, during career breaks. When asked to forecast how their careers might develop, most of the young women raised issues to do with the difficulties of combining working with raising a family. They were well aware of the perceived difficulties and drawbacks of taking time out of time-limited funded projects and would delay having children until their thirties when they hoped to have permanent positions. They still feared discrimination against women with children for such positions. They were very aware of both the general long-hours culture and the specific difficulties of experimental science often requiring evening and weekend work. Part-time opportunities were unknown and believed to be incompatible with maintaining a research career. They were still optimistic and predicting progression in their careers, several expecting to be working at a senior level but not necessarily emulating their current senior colleagues. They were looking for careers that enabled a life outside work and the opportunity to have a family. Whilst obviously ambitious, many put job satisfaction and conditions before status and salary.

In and out of the pipeline

The second study, carried out as a contribution to the Athena project, explored aspects of women's careers in science in HE through the experiences of part-time Associate Lecturers in the UK Open University. (7) Associate Lecturers have flexible hours of work mostly based at home and they can work anywhere in the UK and sometimes beyond. We were interested in finding out if OU working practices attract highly qualified women unused by the rest of the HE sector. Here we used a combination of quantitative and qualitative techniques. A questionnaire was sent to over 500 women Associate Lecturers in Science and Technology seeking both quantitative and open-ended qualitative data. Respondents were also asked to give a thumb-nail sketch of

their careers and career progress using a time-line. Additionally, all the women surveyed were invited to participate in an asynchronous on-line discussion using the OU's computer conferencing system. The aim of the conference was to feed back some of our findings and to discuss issues that arose from the questionnaire responses. One discussion forum was on the theme of '*Barriers, constraints and compromises for women in science and technology*'. Some of the things we learned from these women have implications for the recruitment, retention and career progress of women in science in HE generally.

Current and previous careers and career aspirations

Our average respondent was aged between 40 and 49 years, married or living with a partner, had children and had taken a career break to care for her children. Those who had taken career breaks may have taken more than one break and may have given more than one reason for doing so. 76% of them put their careers on hold to care for their children and the other main reasons for breaks were for study or because of relocation of a partner. At some stage in their careers many of the women surveyed had been in full-time teaching and research; over 25% had been lecturers and over 50% had been researchers. However almost half of the women had at one point or another been in employment not related to HE, science or technology at all. This accords very much with employment patterns described earlier.

Asked what their career aspirations were and if they had met any barriers or constraints in trying to realise them, almost half said they were suitably qualified for other employment that they would rather be in. The majority of these women who were scientists wanted to pursue careers in HE teaching or research, although the technologists were more likely to favour non-HE teaching/training or wanted to apply their skills commercially. The barriers, compromises and choices involved in why they are not currently so employed give pointers for action in the recruitment and retention of women in SET employment, especially in HE. Interestingly our respondents tended not to view such issues in direct gender terms but as their individual choices, although most explanations given were indirectly gender related. The main reasons cited were location, family commitments, career break, no specialist jobs, no part-time jobs, age and gender.

Gains from part-time OU teaching – personal and professional

What led these women to become OU Associate Lecturers and what career gains did they make? They often gave more than one reason for taking on this role and their responses tend to combine several factors. In professional terms, 21% became ALs because they wanted to enter or re-enter science and technology careers and half of them wanted to begin or return to HE. 17% saw this route as a way to make use of and broaden their existing science, technology and teaching skills. A large proportion of these women were seeking out ways to use their training so they could keep their careers going while they could only work part-time due to family commitments. Part-time work which fitted in with family responsibilities but which was mentally stimulating and challenging and enabled them to keep their science careers ticking over whilst on a career break was extremely important to these women. Asked if their time with the OU had helped their careers 42% said their AL experience had helped them professionally in employment both inside and outside the HE sector. Over one third of these women reported that their AL experience had been vital in their being appointed to part-time or full-time posts in science and technology in wider HE. A quarter said that that while working in other HE institutions their AL experience led to promotion or further offers of work. For some it helped by allowing them to maintain continuity in HE employment while caring for small children and for some it was an introduction to HE employment.

We asked women what the most valuable thing was they had gained from being an AL and the responses revealed that the way women feel about their work is more important to them than purely instrumental views about professional development or personal career advancement. A third of ALs value their contact with students most, while one in five say their OU work has boosted their self-esteem or has increased their confidence. A quarter of them value the fact that they have gained new skills or subject knowledge along with being able to stay in HE and keep up to date with their teaching skills and their scientific field. Job satisfaction is valued and many of them are happy that their abilities have been recognised and their contribution appreciated. This indicates that the majority of these women are interested in the relationships they build and what they gain emotionally from their work (job satisfaction, confidence, being valued) and in this sense a positive working atmosphere and working culture is highly prized.

In conclusion

In analysing the detailed and reflective interviews with academic and professional women physicists we identified several issues such as isolation, departmental culture, harassment and compromises which caused difficulties and created barriers at various points in their careers. The younger women indicated that they had already encountered some of these barriers and were anticipating others. They were though up-beat about the potential for career progress as they could see some ways forward. They also suggested different sorts of compromises in putting job satisfaction and conditions before status and money.

From the part-time Associate Lecturers we learned of many of the same barriers to career progress. Career breaks for child-care and changes of location to follow a partner when they themselves had no job mobility had forced many of them to find an alternative in order to maintain some hold on a career. Career progression in science engineering and technology in HE (and probably in other employment sectors) is very different for those who are single and childless. Virtually all these women commented on making '*compromises in their careers that they would not have, if they were male*'. They had however found that the flexible part-time working and the professional development and training opportunities they found in a UK-wide institution like the OU allowed them to overcome many of the barriers and constraints they had previously encountered.

What kind of intervention strategies would help to increase retention and promotion of women in SET careers? Athena ran two successful development programmes: in 1999 the focus was on mentoring, networking and staff development and in 2000 it was on changing organisational culture, practices and processes. (These are reported on elsewhere in this conference). These kinds of strategies go some way towards addressing many of the barriers and constraints identified by women scientists as they reflect on career progress or the lack of it.

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INTERSECTIONS: IMMIGRANT AND REFUGEE WOMEN PROFESSIONALS AND CANADA'S INNOVATION STRATEGY – THE IMPACT OF SOCIAL AND ECONOMIC POLICY

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Issues of women's work within the socio-economic policies of a globalized labour market are often emblematic of the intersections of those policies with values of gender equity and cultural diversity. In this paper, we will address the need for women to strategize in response to these intersections with particular emphasis on advocacy with regard to causal factors affecting global migration, immigration and employment options. We will discuss the systemic gender discrimination that exists within Canada's Immigration legislation and refer to recent legislative and policy shifts that affect skilled workers to the detriment of women in this category. As well, we will look at gender-specific approaches and community innovations that are being created to meet the current challenges to women's self-determination in our working lives.

Globally, women who are trained or training in the new economies remain at risk in their work lives due to the flow of global capital and its resulting mis-divisions and economic inequities. Within Canada, immigrant and refugee women in Science, Engineering and Technology (SET), face both systemic and practical barriers to career continuity and to achieving their professional potential. While recent changes to the immigration legislation and the development of Canada's new Innovation Strategy attempt to address issues raised by a projected deficit of skilled workers, regional and sectoral support of internationally trained professionals is lacking. For the majority of immigrant women professionals in SET, this means that alternation between periods of unemployment and underemployment often characterizes their entire work experience.

To begin, we look to systemic barriers faced by immigrant and refugee women in SET within Canada's immigration legislation. In February of 2001, the federal government introduced Bill C-11, which became the new Immigration and Refugee Protection Act in June 2002. Largely protectionist, Bill C-11 tightens immigration rules and promotes the notion of border control. From a gendered perspective, Bill-C-11 itself is problematic on many fronts.

The Federal Plan for Gender Equality was adopted by the federal government of Canada in 1995. This policy requires federal departments and agencies to conduct gender-based analyses of all policies and legislation since that time. In addition, our government endorsed the UN Platform for Action, which emerged from the Beijing Conference and whose goals include gender equality, development and peace, and more specifically engages states to consider the gender impact of laws, policies and programs. In the final outcome document that was adopted by the General Assembly on June 10, 2000, states committed themselves to “mainstream a gender perspective into national immigration and asylum policies”. Although a gender-based analysis was completed for Bill C-11, no part of the analysis was adopted into the *Act* itself.

Later in 2001, Canada’s Innovation Strategy (CIS), a ten year blue print for social and economic development was launched to enhance Canada’s participation and viability within the new economies. Presented in two papers, *Achieving Excellence: Investing in People, Knowledge and Opportunity*, focuses on strengthening our national science and research capacity to ensure that this knowledge contributes to a healthy and innovative economy. The second paper, *Knowledge Matters: Skills and Learning for Canadians* attempts to address ways to strengthen learning in Canada and to create a forum for the skills and talents of our population. Once again, however, despite the federal requirement to include a gender-based analysis with all federal programs, none was completed for the CIS.

We must conclude then, that far from ‘mainstreaming’ issues of gender-equality, we are living in a time of further marginalization of women’s needs and voices within government, industry and within our communities. Further, despite the rhetoric of the CIS, which calls for increased immigration to address looming skills shortages especially in the areas of technology, no specific funds or programs are delineated therein. As well, Bill C-11 narrows the channels through which skilled workers may enter the country and its categories and point systems are gender biased against women.

Immigration for women in SET occurs in three major categories. These are the Skilled Worker category, the family category and the new Foreign Worker’s Program (FWP) which has been added as an addendum to the bill and as such was exempt from the years’ long community consultations regarding implications of the legislation.

The Skilled Workers category is the subgroup of economic migration wherein many women in SET will attempt to enter. In this category, the legislation seeks to attract individuals who are well educated, established within the sectoral labour market of their expertise, who speak English and or French, and who are wealthy. The other sub-components of economic migration are investors, entrepreneurs and self-employed persons and in these categories, men have historically qualified in greater numbers than women. Further, framing migrant selection on the basis of education, work experience, language and wealth immediately favours men over women within Canada and as well, ensures that gender disparities which exist in these areas globally, are imported.

The new legislation has also altered the selection system so that some of the economic subcategories explicitly value the contributions of a migrant's partner (three partnerships are now recognized in the law: spouses, common law partners and conjugal partners) by awarding points based on a partner's education and language skills at one fourth or one fifth the rate they are awarded for the primary migrant. These additional points will most often be applied to women and represent an official devaluing a women's contribution to family well-being. (FAFIA, 2003)

Family sponsorship constitutes the dominant form of permanent immigration for most women. Bill C-11 continues to pattern family sponsorship on a dependency model wherein the female migrant is most often sponsored by a male Canadian resident. Stipulations exist under this category such that the sponsored female is ineligible for state social benefits payments for the first three years of residency. In this way, sponsorship formalizes a relationship of dependence of the migrant on the sponsor. Should the partnership become problematic for the woman, she has little access to the social safety net and, if she faces a breakdown in the sponsoring relationship, she is liable to face deportation and also separation from her children who would likely remain with the sponsor.

In addition, women who arrive in this category may well have all the necessary skills, labour market experience and language abilities of those in the skilled worker category. However, in the family sponsorship category, these potential contributions to the country are not evaluated. Thus, women who have qualified for immigration under family sponsorship represent a veiled skilled cohort. Under the Immigrating

Women in Science Project, (IWIS), Status of Women Canada is currently funding a project that will delineate the education, skills and experience of women in this category so as to lobby toward valuing their presence in Canada and toward accessing pertinent labour market possibilities.

The Foreign Worker's Program (FWP) is the third category that we believe represents systemic gender discrimination with regard to Bill C-11. In June of 2002, the Minister of Citizenship and Immigration, Denis Coderre, announced a 'dispersion' strategy to enhance the settlement of skilled immigrants across the country. Historically, the primary destinations for refugee and immigrating people have been our three largest cities, Toronto, Montreal, and Vancouver. While there is some concern that these cities and their services for settlement may be coming close to capacity, there is also an economic drive to share the economic and demographic benefits of immigrant populations with smaller, second-tier cities across Canada, for example: Winnipeg, Calgary, Victoria, Ottawa, Quebec City and Halifax. Critical shortages exist in remote communities for a variety of skilled and professional workers and the FWP is designed to supply these regions with the required professionals.

Though the details of the FWP have not been fully elaborated to date, one of the indicated options is a temporary work visa that ties the immigrant to a particular location for three to five years before being granted permanent resident status. It is believed that any individual who does not complete the required length of stay in the designated locale will be subject to deportation. In order to circumvent the issue of mobility rights, which are guaranteed under the Charter of Rights and Freedoms, it is believed that the 'dispersion' strategy will be implemented as an expansion to the current temporary work visas which are used by seasonal migrant workers across the country for various harvest and other forms of seasonal labour. The extent to which the current program benefits the worker remains questionable from a human rights perspective. Further, although the FWP is presented as indicative of 'inclusive' immigration and is couple with the CIS's call for increased skilled workers, temporary workers are not eligible for the programs and services provided to other classes of immigrants. They do not have access to educational opportunities, language and skills upgrading, student loans or domestic student fee schedules. (Jamieson, 2003).

The ways in which the FWP is problematic are myriad. But, in looking at gender issues specifically, the impact of the program on immigrant and refugee women in SET is clear and dangerous. Once again, the female skilled worker will arrive into a program wherein her options for permanent residency and basic well being are dependent on her ability to remain within a specified locale for the required time frame. Although the reasons for urbanization and the increased representation of immigrant communities in urban areas are complex, what is clear is that access to settlement services exist within these urban centers. Without access to settlement support, to language development, to previously migrated family, friends and cultural groupings, the likelihood of the migrant remaining in that locale is low. We also need to consider the scenario of a woman arriving into a small rural setting from another culture where no infrastructure exists to assist her settlement and where no public education has taken place to right a negative reception by residents of that community. The risks, in particular for women who are migrating alone under this program are obvious and range from inaccessibility of settlement support, to marginalization in rural communities due to racism and sexism.

Even after arrival into major centers, immigrant and refugee women in SET professions face multiple barriers to career advancement and full economic integration. Although the national policy of multiculturalism in Canada initially presented as an open door for the celebration of diversity, when asked about the intersection of cultural identity with the identifying markers of local science and technology communities in Canada, women spoke candidly about difference. “The North American scientific community (in particular, Canadian) is very exclusive and just unprepared to adopt a multicultural approach.” As well, styles of presentation and self-promotion were considered more collaborative in nature and more community based. Thus, women experience individualism as a barrier that requires some bridging in order for them to create employment opportunities for themselves and also to establish themselves in academic conversations. If, therefore, we look to gender equity and cultural diversity as underpinning healthy community relations, a great deal of personal flexibility is required on the part of immigrant and refugee women in SET, to learn the cultural and social milieu in the sciences where cultural identity seems to be suppressed in favour of the notion of objectivity.

In addition to the above, critical barriers continue to exist for immigrant and refugee women in a variety of practical arenas. Language is perceived by many women and

by many employers as a barrier. Recently, a regional environmental scan of immigrant professionals indicated that 62% possessed adequate language skills. Despite widespread availability of ESL (English as a Second Language) classes, those for professional women in SET are not widely available. Newly immigrating women in SET have needed to be innovative in accessing language classes in order to accelerate their possibilities in terms of language proficiency. In addition, classes that address discipline specific terminologies are almost non-existent and are cited by women as critical.

The processes of accreditation of foreign credentials and formal acceptance into professional associations remain major barriers for career continuity for immigrant and refugee women in SET. In the case of engineers, for example, Canadian work experience is required in order to be eligible for accreditation and yet, that work experience is almost impossible to access without prior accreditation. This results in a frustration cycle of attempts at entering the community. Recently, the provincial Ministry of Community, Aboriginal and Women's Services (MCAWS) in British Columbia collaborated with the Association of Professional Engineers in BC (APEGBC) on a pilot project to match internationally trained professionals with welcoming engineering firms so as to offer mentorship and work experience. Women were underrepresented in this study representing only 4 of the possible 20 spaces. As well, at the completion of the third phase of the project, only 4 of the 20 participants were actually matched with a firm and participated in on-site work experience.

In addition, Heritage Canada, a federal ministry responsible for citizenship and multiculturalism, has funded each province in the country to provide an environmental scan and profile of the presence of internationally trained professionals and their areas of expertise in each region. Though the study is limited to engineers, physicians, with 'other professional designations' joined to form a third group, the completion of these data may serve to create unique associations for internationally trained professionals in these areas so as to increase the potential for a public lobby on accreditation and professional association issues. Currently, though these associations are in the initial stages, no gender caucus exists in any region of the country and discussions regarding gender equity have proven extremely difficult.

Despite profound gains and innovations by immigrant and refugee women in SET on their own behalf, what remains clear is that due to systemic and practical barriers, these women remain marginalized and at risk. As scholar Yasmin Jawani states:

Lack of dominant language skills, [lack of] accreditation of their qualifications, and the prevalence of racism and sexism, contribute to the deskilling of these women and their subsequent ghettoization in occupations that are dangerous and unprotected. As immigrants, they experience the trauma of migration, which includes dislocation, role overload, as well as role reversal. The latter occurs as a result of their more rapid employment in the labour force, albeit in occupations that are downwardly mobile and marginalized. The isolation that immigrant women experience has been identified as a key factor contributing to their risk. [Y. Jawani, 2001]

In sum, a gap of quite disturbing proportions exists for immigrant and refugee women in SET. Not only are the practical and systemic barriers consistent and gender-biased, but as well, these issues contraindicate the language of multicultural diversity enshrined in Canada's Innovation Strategy. Again, despite a call for increased recognition of education, training and labour market experience of international professionals, though the document contains programs and budget allowances for other sectors, the immigration section is void of specific content in either regard. Though the most recent federal budget did set aside funds to address accreditation issues, these funds will be used for phase two of the internationally trained professional associations, rather than directly to effect change in the structure of accreditation or alternative programs such as access programs, residencies or apprenticeships. Further, although the need for skilled workers may act as motivation for governments at the municipal, provincial and federal levels to create new programs, the potential that these programs bridge the disconnect between government and community life that characterizes major urban centers in the north is questionable given that programs are created within power structures governed by profit driven values of a globalized economy.

The very clearly documented experiences of sexism and racism for women of colour in our nation and the declassing of professional qualifications and expertise as a result of these realities are central issues to be addressed. That the CIS does not recognize women as a particular group with particular barriers to full economic participation and therefore particular needs; and that the document does not recognize women's major contributions to our communities, many of them unwaged, indicates the continued

need for feminist advocacy in all areas, but especially for increased access to full economic participation in sectors concurrent with the education and expertise of immigrant and refugee women.

As is often the case, feminist advocacy emerges from community-based grassroots platforms. The Society for Canadian Women in Science and Technology (SCWIST), a women in science advocacy group founded in 1981, have now developed a project that provides much needed resources, information, and mentoring services to support the career continuity and professional advancement of immigrant and refugee women in SET. The Immigrating Women in Science Project, (IWIS) consists of an open e-resource line, a resource center with a work area, access to SCWIST library, and a quarterly newssheet that highlights the contributions of global women in science and technology as well as stories of IWIS women in Canada. IWIS is also hosting a series of community roundtables in areas of education, bridging programs, professional and post-secondary accreditation, and employment strategies to address current issues of policy and practice concerning immigrant and refugee women professionals in SET and to establish recommendations for change.

The Working Group on Poverty (WGP) is an umbrella organization originally established by various groups of women refugee advocates. This group meets once every two months to address regional issues for immigrant and refugee women across all sectors. The advantage of an umbrella advocacy organization derives from the funding structures for immigrant serving agencies. Many such agencies are reliant upon government ministries for annual or project funding and should recommendations prove critical of government policy, the potential for continued funding is reduced. In this way, the WGP can speak out for change on behalf of those who are economically marginalized, with particular emphasis on issues for immigrant and refugee women, and the individual service providers who are voicing the concerns of those communities are not left at risk. The IWIS project is a member of the WGP, which has been very active regionally in the presence of radical cuts to immigrant services funding. The WGP has also been active in representing the needs of immigrant and refugee women with regard to a new training wage implemented by the provincial government. This program allows employers to pay first time employees a reduced wage for the first 100 hours of their working lives in this country. Initially developed to encourage employers to hire youth, it also impacts

immigrant and refugee women who may well have arrived in Canada with several degrees and many years of professional experience.

At the national level, the Canadian Coalition of Women in Science, Engineering and Technology, (CCWEST), an umbrella association for many women in science groups across the country, has recently received funding from Status of Women Canada to conduct three regional and one national meeting to address issues of representation and retention for women in SETT. These meetings will give women in science across the country an opportunity to share experiences and to ultimately develop a best practices compendium for women in SETT. There will also be a position paper developed with recommendations for change to increase inclusion of women in SETT in industry and the academy as well as for representation of these issues at a federal task force for women in science and technology.

The importance of regional and international networks for women in SET, also emerges at this time as a strategy to enable the successful migration of internationally trained women in SET. The potential of global networks for dialogue and coordinated advocacy for women in SET is clear. In terms of global migration of women in these fields, informed networks could potentially provide forums through which networking between women in SET - before and after migration - could occur, thus enabling career advancement for migrating women.

In a work world that is characterized by economic globalization and in an historical moment of global crisis in migration as a result, engaged advocacy for women in SET must take a variety of forms. We need to remind ourselves that migration is the history of the world, its profoundly rich diversities and its histories of harm. We need to honour indigeneity in all of our communities. In Canada, the history of our aboriginal peoples is an ongoing story of exclusion and discrimination. Although despite this reality, the work of indigenous women in SET is remarkable for its innovation, all advocacy for women in SET must be informed by a respect for indigenous knowledges and rights.

Additionally, we need to articulate a bridging feminism: that promotes principles of sustainability, peace-building and community; that includes and values the interconnectedness of multi-stakeholder systems that effect immigrant and refugee women in SET so that advocacy conversations become public and find root in the systemic consciousness thereby potentially inflecting long-term policy change.

And we need to remind ourselves that we do have each other. Strengthening networks and informed peer-mentorship, both formal and informal, between women in science and technology globally will enhance the possibility of successful migration and immigration. These networks can also serve to increase awareness of issues related to women and work in the global arena and to promote values of self-determination in social and economic policy. Further, and increased global conversation for women in SET who are meeting challenges to gender-equity in their professions, disciplines and communities will serve to promote and protect women's career opportunities worldwide.

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