

**Technology And The Status Of Women  
In India : A Sociological Study.**

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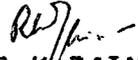
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CERTIFICATE

This is to certify that the dissertation entitled : 'Technology And The Status Of Women In India : A Sociological Study' submitted by Vandana Jain in fulfilment of eight credits out of the total of twenty-four credits for the award of the Degree of Master of Philosophy (M.Phil) of the University is a bonafide work to the best of our knowledge and may be placed before the examiners for evaluation.



  
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( VANDANA JAIN )

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## INTRODUCTION

One of the objective of the new international economic order is to narrow the social and economic disparities between developed and developing countries at the international level and between the privileged and disadvantage nations within the countries. Application of science and technology for development is expected to bring about a social and technological transformation of the developing countries. Any technological change generally disturbs the web of the social fabric and alters the relationship of women and men to the structure. Any innovation is bound to demand adjustment by the people. These adjustments, however, are more difficult for the weaker and disadvantage sections of the society such as the women.

Science and technology in relation to women's status has become an issue of debate all over the world and has gathered much momentum during the current debate. The preamble of the UN's Conference on Science and Technology for Development (UNCSTD, August 1979) states

"The ultimate goal of science and technology is to serve national development and to improve the well-being of humanity as a whole. Men and women in all groups of society can contribute positively to enhance

the impact of science and technology on the development process. However, modern technological developments do not automatically benefit all groups of society equally. Such developments, depending on the given economic, social and cultural context in which they take place, are often seen to affect various groups in society differently. They may have a negative impact on the conditions of women and their bases for economic, social and cultural contributions to the development process. This is seen to happen in industrialised as well as in developing countries.

Science and technology which is appeared to be neutral - or even more an equalising force as 'there is no man, there is no woman in the face of science and technology' - has however not worked and is not working towards equalizing the status of women with man, and is not lessening and removing the discrimination suffered by women at the hands of men. It acts as a principle of 'secondary patriarchy'. The very ideology of science is identified to the 'masculine' and is fundamentally alien to the notion of the stereotyped female. The attributes of science are modelled after the attributes of the males. Science and technology suggest masculine images. Science in particular has been a male preserve. The reluctance of girls to study science, as well as their 'math anxiety' has been noted by many educators. Technology conjures up a 'machismo' image - men tending giant

machines or men climbing into space capsule to perform feats of daring. Technology is part of our culture, and, of course, our culture which is male dominated, has develop technology that reinforce male supermacy. (Rothschild, 1983, p.vii) More often than not, a technologist connotes a man.

Scientists, like everyone else, are born and raised in a particular culture of beliefs, biases, values and opinions and to one degree or another, they will be affected in their work by what they hope, believe, want or need to be true. When the area of research involves matters that touch very sensitively, indeed often exlosively, on scientist's own daily lives, it is even difficult to maintain or is unrealistic to express, a neutral, value-free, objective science. But this objective, value-free stance is precisely what our culture claims to be the characteristics both of the male mind and science (Bleien, 1984, pp. 1-4).

All sciences bear a heavy load of social values " since they are linked to the people who create them and to the social concerns of those people" (Ibid).

Men dominate most professions especially scientific and technical fields. There is a larger debate about women's unequal representation in most professions, a debate which increasingly revolves around biological explanations for these observed

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inequalities. Sex differences in abilities are said to result in different social roles, including participation in science and other male-dominated professions. They may have important effects on efforts to change women's and men's role in society and to change society itself (Zimmerman, 1984).

The sex role stereotypes portrayed by biological theorists push women out of a large number of professions. It is useful to look at these theories of the past century since many of the arguments we see now are direct descendents of these ideas.

In the 19th Century, there were two basic biological theories about the origins of human behaviour :

I) Evolutionary Approach or Social Darwinism - It argued that a woman was a man whose evolution - both physical and mental had been arrested in a primitive stage. Women showed less development of the nervous system and this resulted in a smaller mental capacity. (Hardy, 1981; Zimmerman, op.cit. p9-10 ).

II) Biological Determinism - The second approach tend to find direct biological causes of behaviour by demonstrating a connection between some biological feature, such as brain size and a given trait, such as intelligence. Craniologists assumed that intelligence was directly related to brain size. Men must have bigger brains than women, since they were sure that men were smarter (Zimmerman, Ibid) .

Contemporary theories follow the same two basic approaches as 19th century Biological Determinism.

I) The 20th century evolutionary explanation of humansocial behaviour rely heavily on 'sex differences'. The most influential version appeared in 1975 with the publication of E.O. Wilson's book 'Sociobiology'<sup>1</sup> which argues that males are naturally more aggressive and intelligent than females, other social traits are said to be universal and are derived from these fundamental traits, including a hierarchically - structured society. His assertion that even with equal opportunity women will never achieve equality (Wilson, 1975).

David Barash, in his book 'Sociobiology and behaviour' writes, "women have almost universally found themselves relegated to the nursery while men derive their greatest satisfaction from their jobs".

II. On the other hand the biological-causal theories focus on differences in intellectual abilities as well as differences in aggression and nurturance.

Hormonal differences has been a favorite candidate for causing supposed differences in aggression. One theory, based on the male sex hormone,

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1. Sociobiology : A systematic study of the biological basis of all social behaviour. It argues that behaviour is biologically determined. But it does not take into consideration the human culture, a product of human mind, is atleast some human activities.

testosterone, outlined in a book called 'The Inevitability of Patriarchy' by Steven Goldberg makes the following connections -

"Male equals testosterone, testosterone equals aggression, aggression equals dominance and political power, therefore, men will inevitably in any social setting have power and women will not".

This, of course, implies the exclusion of most women from all professions that involve significant amounts of power, including science (Zimmerman, op.cit. p. 13 ).

So 'Biology' is used as 'politics' by the (male) members of the society for degradation of position of women. So it is politics, not electrons, that determine the path of progress. (Ibid)

Ideas about biological based differences in behaviour between women and men are very widespread at the present time. There is a dialectic between society and biology : biology does not explain the shape of society so much as society explains the shape of biology ( Lowe, 1983, p. 39-62). The attention given by the media to any study which claims to have demonstrated a biological cause for sexual differences in behaviour indicate the political nature of such theories. They end up reinforcing social stereotypes and suggesting that our social structure are 'natural'

and that we should be very careful about trying to change them. The net effects of theories about such things as female and male brains, sex differences in aggression or math genes is to reinforce the already widespread belief that women simply do not have a mind that is compatible with success in male-dominated occupations, especially 'Science and Technology'.

This belief, which may even be growing inspite of the increasing number of women entering science and other professions is one of the major factors keeping women out of these occupations. The evidence is clear that women behave, think and produce pretty much like male scientists when they are in similar situations. Nevertheless, these women are seen as exceptions and the belief persists that women are not really suited for scientific or rational logical thinking. The stereotypes continue inspite of the fact that women and men are in general much more 'alike' than different and the magnitude of observed average differences in behaviour or abilities, which may be over-estimated, is much smaller than the small number of women scientists and engineers.

We need to be conscious of both the 'direct and indirect' effects of these theories on behaviour. Any theory which discusses the origins and theoretical limitations on human behaviour has the potential for affecting behaviour or even biology itself. It can become a self-fulfilling prophecy, creating the very

differences it purports to explain. e.g. if women are told that nature made them less aggressive than men, we should not be surprised if they end up acting in less aggressive ways. Science and technology 'reinforce' sex roles and ultimately justify the whole power structure of society (Zimmerman, op.cit, p.17 ).

Science and technology has been viewed as the objective investigators of nature for the purpose of both knowledge and its control and domination by man. Racism and Eugenics, two other foundation stones of the dominant patriarchal ideology form an integral part of the technology too (Klein, 1984, p.95 ). Masculine ideology and the broad social forces influences the development of science and technology and in turn, social value system emphasize difference in gender, race and class which became encased in technological development (Agarwal, 1984, p. 113 ).

Patriarchal social order has defined private and public worlds, with women in the world of the family and reproduction and men in the world of politics and production. They define differences in women and men's 'natures' that make the sexual division of labour and power 'natural'. These differences then specify the needs and skills of women and men as necessary and complementary to each other ( male aggressivity, female nurturance) and they describe a world that is of necessity. To maintain this sexual division of labour, it is necessary to have unquestioned access to women's bodies, their labour power and the production of their labour. This is

done through marriage, divorce, laws, through the regulation of abortion, birth control and sterilisation, through systematic job segregation, economic exploitation, sexual harassment in employment and job training and educational discrimination and through violence.

So here an attempt is made to analyse the above prospectives within the frame work of Marxist-Feminist analysis.

Marxist-Feminist analyse the relationship at 'partnership' in which capitalism and patriarchy share the economic benefits of women's labour power. Dominant mode of production determines the particular patriarchal relationships in each social formation (McDonough and Harrison, 1978).

According to Marxist-Feminist analysis, in any given mode -

- i) structures of domination and subordination based through the social relations of production;
- ii) patriarchal relations in that mode control the women's sexuality and fertility through the relations of human production; (Mackintosh, 1977, p.122)
- iii) the form of these structures varies historically with the influence of tother structures.

Thus, analysis of women's oppression can be done with the help of Historical Materialism. The central thesis of Historical materialism is that persons live in

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interactions with their social and physical environment. Thus human consciousness is formed by the interplay between persons as subjects and as objects in the world in which they live. The movement of human history from this perspective, involves continuous creation and recreation of human life. In other words, person's relationship to their environment is mediated by the particular historical and social milieu. Thus materialism explains social progress as emerging through human labour and process of production and reproduction. To put it in Engel's words, production and reproduction are the central features of human society (Engles, 1972). In this context, Marx and Engels hold that the first division of labour by sex for the purpose of propagating children, gender emerges as first class antagonism (Ibid, p.495).

Marixst-feminist affirm that women's oppression in the social relations of production and reproduction stands in relation to class oppression. Historically, procreative process is shaped by relations of patriarchal control. Maillasoux (1975) argues that the regulation of women's sexuality is directed by the necessity for social control over the reproduction and the allocation of labour power. He traces the origins of patriarchy to the conditions of social reproduction within the early "domestic agricultural community", wherein the survival of social group depend on i) means of subsistence and ii) the reproduction of new labour force.

According to Meillasoux the first is achieved through allocation and the second through control and regulation of fertility of women (Meillasoux, 1975). Further, mode of production includes organisation of gender relations also (Dorothy, 1983 and Beechey, 1979). Gender permeates socio-political and economic organisations and gender relations are integral constituents of social organisation of class (Beechey, 1979).

Patriarchal household is the historical product of a prolonged and uneven process by which pre-existing forces of subsistence relations became incorporated and adapted to the succeeding relations of production. The patriarchal principle is articulated to the larger socio-political and economic organisation of the society and it cannot be separated from it (Smith, 1983). Specifically, so, as the domination of man over woman takes a specific character within determinate social relations to a specific mode of production. The social relations of production are concentrated in the family and meet the requirements of relation of production. The internal relations of confrontation, co-operation and sexualities are (ultimately) organised as economic and political relations and is the key to women's experience of the personal as political as a reflection of oppression. As forms of domination and oppression of women are shaped by the politico-economic relations of dominance and dependency at large. Forms of family work and living are integral for constructing and reconstructing class

relations, particularly as the dominant class responds to changes in the form of property relations and in the organisation of production (Marx and Engles, 1976)

It is the women's class position that limits the conditions and forms of patriarchy they will be objectively subjected to. (A woman acquires her husband's class position, but not the equivalent relations to the means of production). To quote Delmer, "If the origin of family constituted an achievement it was this, that it asserted women's oppression as a problem of history, rather than biology, a problem which is the concern of historical materialism to analyse and revolutionary politics to solve". (Delmer, 1976, P.287). Hence, women's oppression can only be understood in a specific context of historical conjuncture. Because, gender factor functions socially to meet the structural and functional requirement. Therefore gender as a category has to be applied along with the class lines in order to analyse women's oppression. By using historical materialism, we will be able to identify the operation of gender relations, their distinction or connection with the process of production and reproduction. Relations of production encompasses, the divisions of gender, caste, class and types of labour. Because ideology of gender is produced and reproduced historically in cultural practices. Sex inequality reinforces class inequality, while class divisions are accentuated by gender discrimination. Accordingly, class and gender are central to the analysis of women's oppression (Westergard and Rester, 1976)

Women are divided by gender and class with men as well as within their own sex; hence class-gender is the key

problematic. Gender identity is created spontaneously, continually recreated, endorsed and modified through a series of ideological representations. Gender identity is created in the family household, hence gender relations are to be analysed from the household, at the level of relations of production, class structure is to be analysed; and putting them together, we can understand women's oppression. Thus woman is defined not only with relation to her class position but also in terms of her gender; where the patriarchal relations define her consciousness and the implications for her revolutionary potential.

We live in a world which is dominated by men and which represents the interests of men as a group. Each aspect of the female biology is controlled in a very collective way by science, the state and the economy and that this cannot guarantee the continuation of patriarchy. The oppression of women is a political necessity for the patriarchy. Women have to fulfil the functions assigned to them so that the male society can continue to exist. Also patriarchy sees it as its 'right to objectify and exploit women'. Very often it is our psyche which is manipulated. On many cases it is also our body. Science has placed important roles in the social construction and control of women's sexuality and productivity and idealized temperament. Through their representation of women as passive, dependent, martyred and masochistic, science and technology have reinforced the social stereotype of women as a subordinate member of the patriarchal household and social order. Through their proscriptions and definitions of

normality and maturity, science and technology have lent tacit support to structure and ideologies that condone direct and indirect violence in the social control of women and have, infact, themselves been the instruements of violence against the bodies and minds of women. When we talk about the new technology, we must recognise that we are confronted with a political problem, and not, as we are being told, with a scientific-technological problem.

Science and technology is an insidious manipulations of all components of women's nature, and it is this complex interaction which has to be exposed to demonstrate the full extent of women's oppression and exploitation, inherent in so-called 'beneficial' scientific achievements.

Impact of Science and Technology on the status of women

According to the UNCTSD Report, technology can perpetuate inequality between women and men. In fact, it often makes it worse. New forms of technology, like any gift of power, tend to exacerbate inequalities. Although women have their own traditional technologies, there is ample evidence that women have not benefitted proportionally from technological advances that indeed they have often been harmed by the introduction of new technology, science and technology are not socially neutral. They do not necessarily serve the goals of equality and development unless they are consciously designed to do so. Technology is a two-edged sword. It holds the potential for eliminating the significance of differences in muscular strength between

women and men. Technology unevenly distributed can multiply small differences in productivity between women and men (UNCSTD Report, 1979, p.231).

The Report of the National Commission on labour also cautioned that a policy of heavier investment in more capital intensive industries and technologies had an adverse affect on employment and utilisation of labour. (Report of the National Commission on Labour, 1969, p.379).

The Report of the Committee on Unemployment noted the structural changes taking place in the economy, saying "Technological changes in some of the urban occupations like industry, trade and commerce and in public offices not only reduce the rate of absorpction of new labour but also involve the displacement of some labour, thereby increasing the number of the unemployed." (Report of the Committee on Unemployment, 1973, chap.VIII, para 211).

Even the Report of the Committee on the Status of women in India argues that the participation of women in Industry, shows a general stagnation and a distinct decline after 1961. One of the reason for exclusion of women from industry was technological change and rationalisation of the processes of production which reduced the demand for unskilled labour. (Towards Equality, 1974, p.153).

Boserup thesis was that development adversely affects the status of women. As Boserup explained, women working at home in weaving and dyeing, e.g., are displaced by machines in factories operated by men. Introduction of modern form techniques also tend to operate so as to replace women by men trained in the newer techniques. It is not

contd...

simply a matter of technological displacement but also of displacement of women by men trained for more complex production and processing. This kind of displacement of women operates in an ever-increasing spiral and thus resulting in 'loss of their social status' (Boserup, 1979, p.139-140).

Thorner, while presenting the secular trends in the Indian economy for the period 1881-1951, observed that the increasing number of women in agriculture and their falling number in industry seemed to reflect, "the shift from home crafts and industries such as hand-weaving and rice-pounding, the latter a typically female occupation, to modern mills in which employment is available mainly for men." (Thorner, 1962).

Acharya explained the decline in women's employment in modern organised industry as the consequence of technological change using the more refined indicators of capital accumulation and capital intensity, he demonstrated shifts in industrial structure over the period 1950-74 which eliminated many jobs previously done by women and provided few opportunities for entry of women into new occupations. In twenty five years women's employment increased by only 55% while men's rose by 88% (Acharya,1979). In a separate study Acharya elaborated this analysis to explain the fall in female labour force participation rates from 1901 to 1951 as resulting from slow economic growth as well as the nature of technology (Acharya,1979).

Sinha attributed the declining share of women in

economic activity between the years 1901-1961 mainly to loss of job opportunities for women in the non-agricultural sector. Of this loss only 8% Sinha argues are due to the declining importance of industries and services which previously offered substantial employment to women. He suggests that technological change that reduced scope for female employment in some industries might be one reason (Sinha, 1972).

Pranab Bardhan dealt with the question : How does mechanisation and intensive cultivation affect women's employment? He conclude that the women's position is altered by shift in capital intensive innovations such as the application of chemical fertilisers by men in place of manuring by women and rice mills which displace hand pounding.

Woman is still considered as a burdensome appendage. She is an economic drain. The female child in India is considered a liability in every way. Thus, even before she is born, efforts are made to eliminate her. Modern science is now being 'misused' to prevent her birth and ensure the quality of the human race by helping to produce the 'right sort' of babies be they male, fair skinned or super-intelligent. Science and technology are not neutral in content. That they are determined by the prevailing social structure is clearly demonstrated by the sex determination and sex preselection techniques. Techniques such as sonography, Fetoscopy, Needling, Chorion, Biopsy, ultrasound scanning and the most popular one - Amniocentesis are increasingly becoming household names in India combined with population control

policies and strengthening patriarchal institution and attitude of male domination.

The dangerous drugs and injections ( e.g. injectible contraceptives - NET-EN, Depo-Provera) has been experimented on women without informing about the side effects or the fact that it was being tested on them. Women are treated as 'guinea pigs' for experimentation, especially 'The Third World Lower Class Women'. It is not just a social issue but also a question of medical ethics. It is more unethical and inhuman to create iatrogenic problems ( doctor or medicine-induced problems) and to then give further unsafe hormonal preparations to counter this effect.

Women are seen as 'stereotypes'. Although science and medicine are supposed to be neutral in their approach and methodology, their perception of women and women's nature is the sexist stereotype of "woman", the irrational, neurotic and hysterical being". Women's health and health problems are hence wrongly and unjustly dismissed as being 'psychosomatic' in origin and fictitious and a figment of her imagination. The drug companies, the medical profession and the policy-makers are governed with a male-oriented view.

In a developing country, like ours, the 'Information Technologies' (mass media) have a special role to play in the development of social and cultural values. The knowledge, information and power disparities between men and women have increased tremendously over the last few decades as a result of 'development' and 'modernisation' aided by male-dominated

and male-oriented media (Bhasin, 1984, p.11). According to the committee on the portrayal of women in the media (1984, p.26), the plural nature of the Indian culture and the diverse roles that women play is neither acknowledged nor communicated. This results in reinforcing the stereotyped images and role specifications of women and in a unidimensional projection of their social reality (1984, p.26). Propagation of these values are based on dominance of 'class and gender'. Media has clearly discouraged the emergence of a new women, a new man and a new relationship between them (Bhasin, 1984, p.6-7). Because of distorted concepts of 'housewife', head of household and economic activity etc., the productive roles of women have been completely ignored. Women have either been left out of all the major national development projects, or included only in peripheral activities (Pradhan and Shrestha, 1983).

Depending on the given economic, social and cultural context in which science and technology take place, are often seen to affect various groups in society differently. Science and technology are not being used to remove discrimination but are being used to discriminate against women'. They may have a negative impact on the conditions and 'status' of women and their bases for economic, social and cultural combinations to the development process.

The term 'status' denotes relative position of persons in a social system or sub-system which is distinguishable from that of others through its rights and obligations (Towards Equality, 1974, p.3). In the pure

sociological sense, status denotes only position vis-a-vis others in terms of rights and obligations, in terms of superiority and inferiority ( e.g. in terms of power, privilege, advantages and disadvantages) (Ibid, p.6).

Thus, 'status of women' may be defined as the total configuration of the attributes associated with various positions which women may occupy in the society at a given point of time and the perception of these attributes by the occupant of the position as well as by others, each weighing the attributes according to his or her cultural centrality and individual frame of reference. The various dimensions on which the person perceives his or her status and others status may not be equally important at any point of time. (Mukherjee, 1975, p.29) Status is realised through roles and brings into focus the rights and opportunities provided to women by the state and socio-cultural institutions to perform these roles. (Towards Equality, op.cit., p.4).

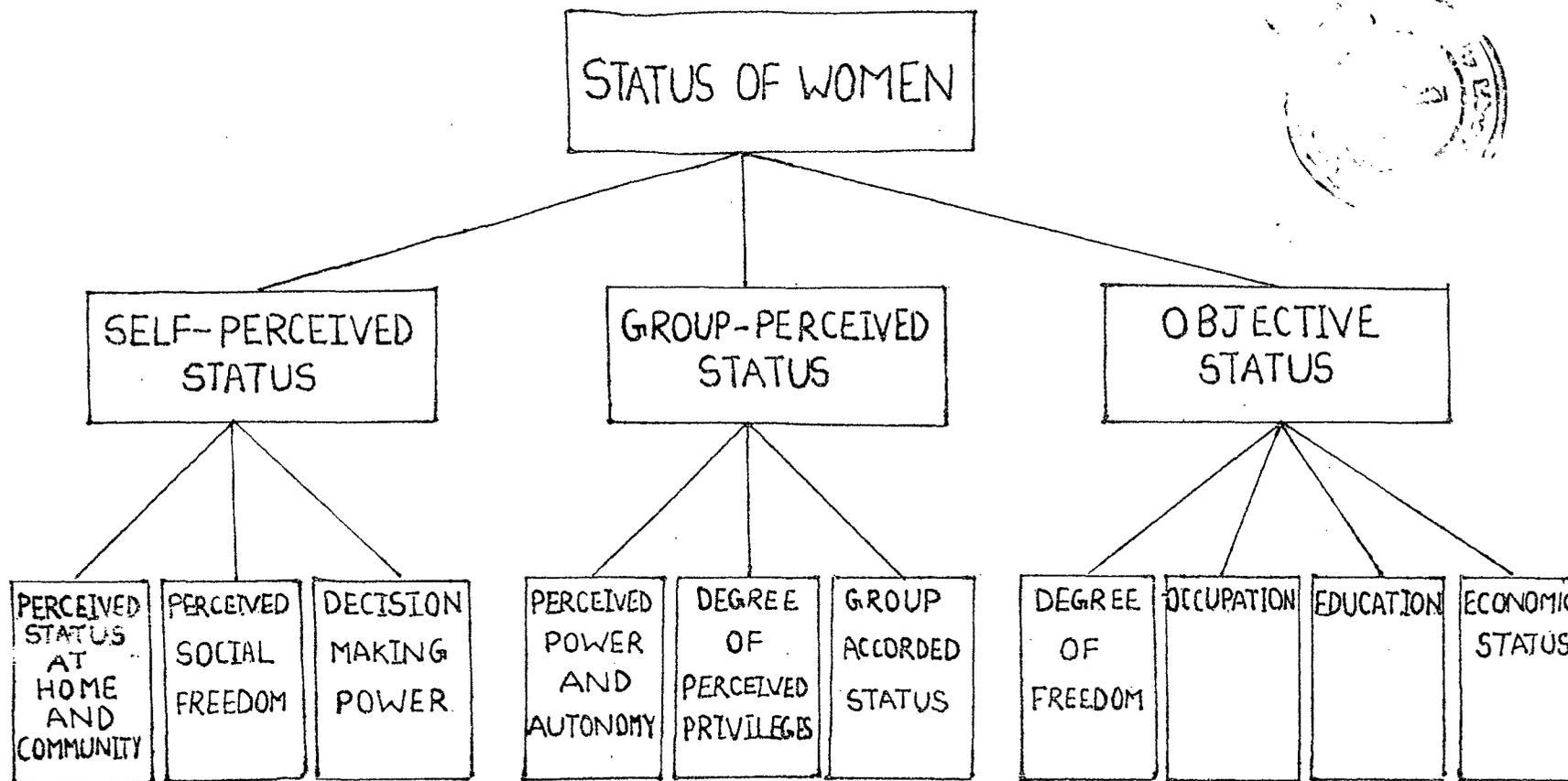
A Hierarchical model of status of women -

According to B.N. Mukherjee, factors such as the objective, subjective and group-perceived statuses are inter-related to the extent to which the occupant of a position and the members of the group are guided by their objectivity of perception.

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# A HIERARCHIAL MODEL OF STATUS OF WOMEN

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SOURCE : MUKHERJEE, 1975, P.32



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The following are some empirical observations on the impact of Science and Technology on the status of women -

1. The effect of technological change on women varies with the underlying sexual division of labour and the content of this sexual division of labour itself varies.
2. With technological changes, there is a tendency to a possible decline in income generating activities for rural women and it intensifies rural women's marginalisation and pauperisation.
3. Rural women tend to be associated with sectors of production which remain at low levels of productivity.
4. Women's access to technology, extension services and various inputs (physical, capital, skills) is in no way commensurate to their role as a factor of production in the rural economy.
5. With the introduction of new technologies and the extension of commercialisation of trade and services, women have been largely excluded from technically advanced sectors and act to the detriment of the women as their decision-making powers are weakened.
6. With technological changes, there is a tendency to increase work burdens on women.
7. Active discrimination on the basis of sex is exercised in wage-rates, preference in employment and types of jobs due to the introduction of new

technological innovations.

8. The dynamics of technological change (especially in newer industries like electronics, computers) continuously displace women workers into low-skilled occupations. Certain low technical jobs are becoming 'women specific' such as assembly operation in electronics industry etc., which are non-transferable and are poorly paid.
9. The introduction of new technical equipments such as automation (computerisation) entail the elimination of much clerical work which is mostly occupied by women workers.
10. Technological innovations leads to an increase in family income and a rise in family income means a withdrawal of woman in the family from the labour market and the increase exploitation of women labour and there is a tendency towards the 'housewification' of women workers.
11. The recent increased prosperity in the wake of technological changes has resulted into an 'increase in dowry practice' which is reflected in several areas of green revolution which has resulted into misuse of advance scientific innovations such as sex-preselection and sex-Determination techniques (Amniocentesis) resulting into mass-scale abortion of female fetuses.
12. Many young women workers in industries such as electronics, mining, textiles, agriculture etc. suffer from health problems - those related to

the use of chemicals in the production process. Some of these health problems will remain with them even after they leave their jobs and their employers are in no way held responsible for them.

13. Due to industrialisation, migration from rural to urban areas takes two forms : the male may migrate alone leaving his family in the rural area, or the female may migrate either alone, if she is young or with all or part of her family. In both cases, there is a breakdown of traditional family relationships and consequently the emergence of new family structures with new roles for women.
14. Women's involvement in traditional small scale village industries - even when assisted by the new improved 'appropriate or Intermediate technologies', perpetuates the marginalised position of women in the rural economy and perpetuates dependency instead of fostering self-sufficiency.
15. Eugenic technologies treat women as guinea pigs for experimentation and it does not allow to have control over their own bodies. These technologies are being institutionalised to reinforce the existing mechanism of controlling and oppressing women.
16. Information technologies have perpetuated dominant ideologies and myths about women and reinforces the traditional 'sex stereotypes' and led to the knowledge, information and power disparities between women and men.

# IMPACT OF SCIENCE AND TECHNOLOGY ON THE STATUS OF WOMEN

## BIOLOGICAL DETERMINISM

- and women's oppression
- and female superiority / inferiority
- and Human nature

♀ = NATURE / ♂ = CULTURE  
— as a prevailing assumption

SCIENCE, TECHNOLOGY  
AND  
WOMEN

## INDUSTRIAL TECHNOLOGY

- Housewifization or Liberation of women workers.
- Pauperisation or Income-Enhancement of women workers
- Job displacing or Enhancing effect on women workers
- Marginalisation or Inclusion of women workers in the economy.

## EUGENIC TECHNOLOGY

- as liberating or restricting women?
- as control or lack over their own bodies.

## INFORMATION TECHNOLOGY

- Depiction of women's image as positive or negative?

## APPROPRIATE TECHNOLOGY

- as appropriate or inappropriate for women?
- as increasing or decreasing physical drudgery on women?
- causing dependency or self-sufficiency for women?

## SCIENTIFIC KNOWLEDGE

- as productive system
- as excluding / Including women

Concepts of Sex, Gender  
— and Scientific Development

While it is not possible to reject technological advancements at the turn of the 21st century, certain questions have nevertheless to be asked -

Are all technological changes that are adopted necessary? Is technology gender neutral? Who takes decision on introduction of new techniques and whose interests are served? Are technological changes in different spheres of productive activity also accompanied by changes in the ownership of means of production, division of labour, generation of surplus and its accumulation and labour absorption? Do particular forms of production organisation - homebased production, putting out system, factory production, productive activities in the informal sector advantageous or disadvantageous to women of different classes in respect of employment, income, access to and control over productive assets, credit, skill acquisition etc? Can questions of technology and forms of production be studied without considering the socio-economic-cultural background or without considering production relations? Can these be analysed without considering the nature of power relationships within the household? What is and what ought to be the role of the state, if women's interests are to be protected?

The above questions posed are explained in this study.

The 'Paradigm' on the previous page has explained the inter-relationship between Science, Technology and its impact on women.

The basic category of modern thought have taken shape

as a series of dualities: reason has been opposed to feeling, fact to value, culture to nature, science to belief, the public to the private. One set of qualities - reason, fact, objective - came to represent constituent of rational discourse and scientific knowledge. The other set of qualities - feeling, value, subjective - have been defined as unpredictable and irrational. When the dualism of masculinity and femininity was mapped onto these categories, masculinity became synonymous with reason and objectivity - qualities associated with participation in public spheres of government, commerce and science. Femininity became synonymous with feeling and subjectivity - qualities associated with the private sphere of health and home.

Men dominate most professions, especially scientific and technical fields. This, however, is almost the only aspect of sex and professions about which there is an agreement. 'Scientific rationalism' has become the dominant way of looking at the world throughout Western industrial society. Then, since science and the scientific world new deal with power, science is seen as masculine. Its attributes have come to be equated with the attributes of men, while the opposite attributes have come to be associated with women. The domination of scientific rationalism has meant that the specific traits assigned to women and men have been strongly influenced by the definition of traits necessary to think 'scientifically'.

Scientists naturally turned to the question of the origin of these sex differences in behaviour which they took to be universal, and looked for their basis in

natural law. Their belief that society was founded on biological or physical laws made it reasonable to look for biological explanations for women's nature as the emotional, subjective nurturer and ultimately justify the whole power structure of society. The net effect of theories about such things as female and male brains, sex differences in aggression, or math genes is to reinforce the already widespread belief that women simply do not have an mind that is compatible with success in male-dominate occupations, especially science and technology. This belief, which may even be growing inspite of the increasing numbers of women entering science and other professions, is one of the major factors keeping women out of these occupation. So "Biology" is used as "Politics" by the (male) members of the society for degradation of position of women. So it is politics, not electrons, that determine the path of progress.

Science and Technology is a system which has been devised by men to save the needs of men. Science and Technology exude a masculine aura - an intellectual machismo for men who are brainy rather than brownny. The scientific knowledge is a productive system but the kind of research projects which are undertaken and supported, the problems which are considered important, the way research is conducted, the techniques and devices produced and the way these are used reflect the perspectives and values of the men who control the scientific and technological establishments. The application of scientific knowledge reflect an 'androcentric neutrality'.

An attempt is made to analyse the Industrial Technology has resulted into 'housewification' (reduce women's work to the status of unpaid household help) or liberation of women workers, intensifies rural women's 'marginalisation', in

the economy or 'pauperisation' ( i.e. displacement of women workers from the previously held jobs to lower productivity and low wage expectations).

Whether the Eugenic Technology has resulted into control or lack over their own bodies ( i.e. who are the women being experimented upon? How much information are they being given to persuade them to 'volunteer'? Are they even aware that these are experiments?)

Whether the Information Technology have perpetuated the depiction of women's image as positive ( i.e. independent, self-confident, self-reliant, dominant rational, objective) or negative ( emotional, superstitious, submissive, dependent, self-sacrificing and irrational creatives incapable of rational actions or decisions).

Whether the Appropriate Technology is appropriate or inappropriate for women 'i.e. in accordance with their priority needs, socio-cultural values, solving their problems or not); increasing or decreasing physical drudgery on women (making their working conditions better or worse); causing dependency or self-sufficiency for women (increase or decrease in productive capacity of women workers, help them to produce goods and services for minimum needs or not).

Methods of Study - The study is based on review of secondary data, which may be classified under two categories :-

- 1) Basic documentary sources - Secondary and tertiary which provide demographic data and statistics with regard to the employment and wage pattern of women workers.
- ii) Reports of Committees and Commissions, appointed by the Government from time to time. These provided the information on economic participation of women and type of mechanisation adopted in different industries.

CHAPTER I

INDUSTRIAL TECHNOLOGY AND THE STATUS OF WOMEN

The role and degree of integration of women in economic development is always an indicator of women's economic independence, social status and also is a measure of women's contribution to economic development. Women population of the country is the most important segment of the population in terms of its economic participation and size. Therefore, women force could influence the pace and pattern of economic development and in turn the process of economic development also influenced the pace and pattern of economic participation of women. (Haggade, 1984, p.1)

Women are one-half of the adult population and one-third of the official labour force, performing two-thirds of the worlds' working hours, earning one-tenth of the income and owning one per cent of world property (United Nations, 1957). In most of the countries the choice of technologies and their implantations sharpen the already marked disparities in earnings. There is ample evidence to show that the processes of 'modernisation' and 'technological advance' have been directed almost exclusively to male peasants in developing countries (Castillo, 1977, p.2). Conventional forms of technology have led to the exploitation of women. Technological change, so far, had adverse effect on women's employment. (Singer, 1977; McDowell and Hazzard, 1976; Castillo 1977; ILO, 1977).

Trends in Economic Participation -

The long term trend in economic participation of women indicates an overall decline both in percentage of workers to total female population and in their percentage to the total labour force after 1921.

The following table will indicate the sex-wise distribution of working population -

TABLE I  
SEX-WISE DISTRIBUTION OF WORKING POPULATION

INDUSTRIES	MALE		FEMALE	
	1971	1981	1971	1981
1. Cultivating	46.21	43.70	29.71	33.20
2. Agricultural Labourers	21.26	19.56	50.48	46.18
3. Livestock, Forestry, Fishing, Hunting and Plantation, and allied activities	2.35	2.34	2.55	1.85
4. Mining and Quarrying	0.54	0.62	0.32	0.36
5.a) Household Industry	3.36	3.18	4.47	4.59
b) Other than Household Industry	6.64	8.92	2.56	3.55
6. Construction	1.34	1.81	0.64	0.80
7. Trade and Commerce	6.37	7.33	1.60	2.04
8. Transport, Storage, Communication	2.88	3.32	0.32	0.38
9. Other Services	0.05	9.22	7.35	7.05
Total	100.00	100.00	100.00	100.00

Source: Registrar General of India, Labour Bureau, Ministry of Labour, Government of India, 1975 and Census of India, 1981.

From the above table it is seen that in 1971, 19% of

the total rural working force in India as women. The women workers are mainly engaged in agricultural operation and allied occupations. It was found that in 1971, 80% of working female population was engaged in agriculture. Nearly the same rate prevailed in 1981 Census also. In 1971, female participation rate for rural and urban women was 14.55 and 7.37% respectively. 50% of the total working women were agricultural labourers while it was 46.18% in 1981. Generally, largest number of urban women are employed in services and manufacturing. The broad distribution of male and female workers in India is in the ratio of 5:2:3 and 1:2:1 among cultivators, agricultural labourers and the other work.

The participation of women in industry, shows a general stagnation and a distinct decline after 1961. According to the Report of the Committee on the status of women in India, with rapid increase in the modern and organised sector industry, the share of household industry declined rapidly. Since they constituted the biggest traditional source of women's employment outside agriculture, women were the greatest victims of this process of economic transformation. The other reason for the exclusion of women from industry was technological change and rationalisation of the process of production which reduced the demand for unskilled labour. (Towards Equality, 1974, p.153)

The social impact of the transfer of capital intensive technology is an issue which has evoked

concern among social scientists and planners. Whether the transfer of a particular technology would contribute to the removal of poverty or improve the standard of living of the people? Yet its impact on employment and its income generating capacity are increasingly being questioned.

The capital intensive pattern of production followed in India is an effort to develop industry has had a number of far-reaching effects on labour, especially the women component of the labour force. One of the most obvious consequences, is the direct replacement of labour by capital and modern management methods of rationalisation. The primary victims of this change are women workers, who form the lowest ranks of the industrial labour force and are mainly in the unskilled and badly paid jobs. As these unskilled and tedious repetitive jobs are taken over by machines, the women find themselves out of work. These machines are invariably always operated by men, pushing the women workers out of this sector of industry. This structure is worsened by existing social mores and values where preference is given to the male for the acquisition of skills or training, equipping the worker with the necessary skills to operate the machines.

Another consequences of the choice of capital-intensive technology is that with the diminishing use of labour in the industrial sector fewer people are involved in jobs which give them a steady income. Thus,

the opportunities for bringing in a social transformation and changes in value structure through better incomes and trade union activities are fewer. When the majority of the production continues to be employed in occupations of subsistence, there can be little or no opportunity for social change or human development. (George 1984).

In this Chapter an attempt is made to analyse the impact of technological innovations in the -

- I. Unorganised Sector.
- II. Organised Sector.
- III. Automation (Computerisation)
- IV. Multinational Corporations (Free Trade Zones or Export Processing Zones)

on the status of women workers.

I. UNORGANISED SECTOR

The majority of women workers are concentrated in this sector. Unorganised sector includes agricultural sector (excluding the plantations and government farming sector), Small Scale Units (where less than 20 workers are working without power or less than 10 workers are working using power), and informal sector (which includes self-employment activities on the fringe of the organised sector).

94 per cent of the women workers are engaged in this sector of the economy. Out of this, 80 per cent involved in agriculture and the remaining in non-agricultural occupations. The majority of women workers in this sector are engaged in 'unskilled' occupations. The introduction of technological innovations led to reduction in the demand for unskilled labour, which has an adverse impact on the women workers.

(A) AGRARIAN SECTOR

A majority of women workers in India are employed in the agrarian sector. In 1978, out of 88.9 million women workers 77.5 million were employed in rural areas, most of whom were either agricultural labourers or cultivators. (Draft Sixth Five Year Plan, 1978, p.142)

The sharpest fall in women's employment was during the Green Revolution decade i.e. 1961-1971, when the female labour force declined from 60 million to 34 million. (Towards Equality, 1974, p.23). A resurvey by the Census in order to make the 1971 Census comparable with the 1961 figures also reported a fall from 31.4 per cent in 1961 to 13.1 per cent in 1971 in the proportion of rural women workers. (Mazumdar, Sharma and Acharya, 1979, p.23). The working group on employment of women in November, 1977 came to the conclusion that women formed the largest section of unemployed in both urban and rural areas. (Kelkar, 1985, p.3).

The Green Revolution led to a very definite increase in the number of agricultural labourers but the records also show an increase in disparity between the sexes among them. whereas in the years 1951 and 1961 the proportion of women among cultivators had been between 289 to 498 per 1000 men, the ratio fell sharply between 1961 and 1971 to a figure of 135 women to 1000 men. Similarly upto 1961 the female proportion among agricultural labourers had been relatively stable, but between 1961 and 1971 it dropped from 819 women per 1000 men to 498 women to 1000 men. According to the Rural Labour Enquiry

(1974-1975) the number of all rural labour households in India recorded an increase of about 39 per cent between 1965 and 1975 while agriculture labour households registered a rise of about 36 per cent during the same period. In the case of women the rise in their figure as agricultural labourers has been even sharper during 1961 to 1971 approximately 50 per cent. (Mazmudar, Sharma, Acharya, Op.cit., p.21).

The following table will indicate the distribution of women workers in Agriculture between 1951 to 1971.

**TABLE II**  
DISTRIBUTION OF WOMEN WORKERS IN AGRICULTURE  
1951-1971.

Category	1951.No. of Female Workers	%age of total no. of Female Workers	1961 No.of Female Workers	%age of total no. of Female Workers	1971 No.of Female Workers	%age of total no. of Female Workers
1. Cultivators	18367875	45.42	33103198	55.73	9266471	29.61
2. Agricultural Labourers	12693671	31.39	14170831	23.86	15794399	50.46
		76.81				80.07

Source: Towards Equality, op.cit. p.163.

Excluding the figures for 1961 as a deviation case, which may be attributed to the broader definition of cultivators adopted in that Census, the decline of women cultivators from 183.6 lakhs in 1951 to 92.6 lakhs in 1971, i.e. by nearly 50 per cent, can be attributed by increasing pauperization leading to loss of land or inadequate growth of productive employment opportunities on family farms, leading to withdrawal of women from active cultivation.

The Committee on the status of women in India found that a rising level of employment in agriculture, particularly as agricultural labour, is an indicator of "increasing poverty and reduction in the level of employment and not of improving rights and opportunities for economic participation." (Ibid, p.163). The average daily earnings of women agricultural labourers in Uttar Pradesh was recorded as Rs.1.10 in 1961-65, though it went upto Rs.3.19 in 1974-75, according to the Rural Labour Enquiry, thus indicating a decline in real wages. (Rural Labour Enquiry, 1974-75 p.106).

The Green Revolution (Agricultural Modernisation) -

The Green Revolution in Indian agriculture began with the Intensive Agricultural Development Programme (IADP) in 1960-61. The programme's large-scale expansion, the so-called 'Green Revolution' began in 1965. (Sen, 1981, pp 32.33).

Agricultural modernisation has been associated with a variety of technological and other innovations, which in very broad terms can be classified into four categories:

- i) those that are land saving, labour using and yield increasing into this category would come biochemical inputs (high-yielding variety (HYV) seeds, chemical fertilisers, etc.) and the introduction of modern forms of irrigation such as tubewells and pumpsets.
- ii) those that are essentially labour saving, such as combine harvesters, wheat threshers, maize

shelters, rice mills, maize mills - in other words, the post-production innovations;

iii) those whose effect on the use of land or labour or on output cannot be stated categorically, since the impact can vary under different ecological and sociological conditions into this category come tractors;

iv) other changes associated with agricultural modernisation in the Third World which are not strictly technological innovations but are nevertheless important viz. the introduction of cash cropping in areas, where previously crops were grown for subsistence. (Agrewal, 1984, p.79).

Women carry out a major part of agricultural activity, especially at the time of transplanting paddy, weeding, threshing, harvesting and processing of food grains. Therefore, it is essential to examine whether agricultural technology has favourable or detrimental impact on the status of agricultural women workers.

THE IMPACT OF AGRICULTURAL MODERNISATION ON  
THE STATUS OF AGRICULTURAL WOMEN WORKERS -

Agricultural modernisation have different implications for women and men even of the same class of household. The women in the agricultural sector belong to three different socio-economic classes -

1) Landless households with insufficient land for subsistence where women have to hire themselves out as wage labourers.

2) Small cultivator households with adequate land for subsistence but where the women have to work on the family farm.

3) Large cultivator households which hire in labour and where women of the household perform mainly supervisory function. (Ibid, pp.69-70).

Gender differences in the impact of technological change in agriculture, within each socio-economic class, may be expected to stem from initial differences between women and men. (Agarwal, 1984, P.A-39).:

1) there is already an unequal distribution of the ownership of and control over material resources between households;

ii) women in the poorer households already have a high work burden both in absolute terms and relative to the men;

iii) the division of cash and consumption within the household tends not to be in women's favour. (Agarwal, 1984pp 77-78).

These initial differences would themselves stem from historical, social and cultural factors which, in addition to the economic, govern the norms vis-a-vis the existing sexual division of labour, both within the home and outside, in any community. (Ibid, P.A-43).

There is a need to evaluate the effect of technological change by gender as well as at by class -whether it exacerbate the problems for women or alleviate them.

#### 1 Increase in the Displacement of women workers-

The introduction of modern methods of cultivation has affected women's employment drastically.

(Patel, 1984, P.1). Green Revolution has brought

in its wake the All-India trend of pauperization and marginalisation and the increased inequality between the sexes. It desires women the employment opportunities otherwise available to them. (Kelkar, 1985 pp.4). Palmer argues that where mechanisation is introduced, female tasks become male tasks. (Palmer, 1978). Dixon argues that -

The 'finance intensity' of the new technology often necessitate multiple cropping for profitability. This in term ---creates sharper peaks in labour demand, and generates incentives for --- farm machinery on the harvest side, the growth of output increases the demand for harvest labour and leads to possible replacement of human labour by machines for reaping and threshing. (Dixon, 1978, p.89)

Mechanisation implies an increased demand for trained personnel and a reduction in that for unskilled manual labour, effectively excluding women. (INCCU,1977)

The damaging effect of the present agrarian development policy is reflected in the decline of female cultivation by 50% from 1951 to 1971. On the other hand statistics show that the number of female agricultural labourers has increased over the same period and while women find employment only for 138 days a year, men have work for at least 208 days. (Brandtzaeg, 1979 .p.1921)

The new agrarian technology in terms of pumpsets tractors, threshers, etc. has caused a reduction of labour force to about one fifth of that involved in the traditional farming. (Billings and Singh, 1970) . Experiences of Punjab and Maryana show that Green Revolution (agricultural mechanisation) has rendered mass of women jobless. (Singh, 1980). Punjab, the heartland of the Green

Revolution has the lowest rate of women's participation in the labour force i.e. 1.18 per cent. (1971 Census). Haryana has a 2.41 per cent over-all participation rate of women. (Chakravarty and Tiwari, 1979). The sharp fall in the demand for female labour is also noticed in other high productivity areas of Tamil Nadu and Andhra Pradesh. In Thanjavur District of Tamil Nadu the number of male agricultural workers increased from 583.3 thousands in 1961 to 699.8 thousand in 1971, while the number of female agricultural labourers came down to 175.6 thousand from 321.2 thousands (Ibid, 1979). The removal of women from their means of production and from productive functions by the introduction of new technologies in West Godavari District of Andhra Pradesh has been pointed out by Maria Mies. (Mies, 1980).

Increasing pauperisation of the rural population is also evident from the fact that in Western Uttar Pradesh between the years 1961 and 1971 ( a period of concentrated mechanisation and technological penetration in agriculture), there was an increase of 138.9 per cent in the number of agricultural labourers. (Nayyar, 1977, p.78). In this trend of pauperisation, women are exploited the most by labour-displacing technology for they are the foremost section to be ousted from economically productive activity. This is evident in the fact that in Uttar Pradesh the percentage of rural female workers declined from 59.20 in 1961 to 8.54 in 1971. (Towards Equality, op.cit, p.156). This reflects the fact that the competing

power of the poor in general and women in particular is brought to a minimum, making them easier to control.

The deleterious effects of agricultural technology on the employment of rural women in India have been pointed out by a number of studies.

Laxmidevi (1982) in her study shows that with the advent of mechanisation, women's contribution to agriculture has been on the decline, as they are unable to cope with the new innovations in agriculture there is a decline in women's economic activities compared to villages where traditional farming is still in use. (Davi, 1982).

Another study (Brandtzaeg, 1979) has placed an argument that in the process of modernisation and technological change in the third world countries ( a case study of India), women suffer a loss of economic authority and general status due to "technological displacement".

Palmer (1977) has shown that the present methods of introducing commercial crops and technological improvement in agriculture frequently have the effect of increasing women's work burden and also reducing their ability to secure an equitable share of family produce and cash income. Castillo (1977) observed that certain technological choices are not only labour specific in that they might use or dispense with units of labour, but that they were 'female labour specific' in that they absorb male labour and at the same time disemploy female labour. This generalisation appears to apply to multiple agricultural tasks (such as weeding, harvesting and carrying operations), food processing and a wide range of construction activities. Sawhney (1982) has argued that increased

mechanisation of farming has led to mass-retrenchment of women agricultural labourers, for it was they who did most of the weeding, transplanting, threshing and winnowing before the advent and use of labour-saving harvesting and processing machines. The study at the Lady Irwin College on "New Agricultural Technology and Employment of Women 1981" shows that in the villages of Pachanpur and Mehrauli of Najafgarh Block in Delhi, introduction of mechanisation 5-6 years ago for operations like preparation of land, sowing, application of fertilisers, irrigation, threshing and winnowing, on an average, has reduced the total employment days of the women. (Sawhney, 1982, p.28). In the 'Green Revolution' areas of Gujarat, Maharashtra, Haryana, Punjab, Karnataka, the use of farm machineries like power tillers, power cultivators, power threshers, wheel tractors, energised pumpsets have increased drastically in the post-1966 period. This type of capital intensive farming has resulted in displacement of female labour. (Blyn, 1983, p.713). Micro-studies of Muzaffarnagar (U.P.), Ferozpur (Punjab) and Coimbatore (Madras) also prove the same. (Jose, 1984, pp. A-93 to A-103). A study based on data from six villages (two each in the States of Tamilnadu, West Bengal and Kerala) has shown that any innovation in paddy cultivation whether it is switch over from hand-pounding to rice-mills, from traditional manure to artificial fertiliser, from weeding out of herbs to use of herbicides, from manual transplanting to machine transplanting, throws women out of work. (Mencher and Sardamoni, 1982, pp. A-149 to A-167; Mukherjee, 1983)

.....

Agricultural modernisation has led to the introduction of land saving, labour using and yield increasing techniques, which has an adverse impact on the women of landless agricultural households.

A study done in the 1960's, in the early phases of the green revolution in the Punjab, found that women were engaged in eleven agricultural tasks ranging from levelling of the field to irrigating, applying fertilizer, harvesting and transporting. Shortly after the introduction of new seeds and fertilisers, mechanical innovations appeared, which led to the displacement of "casual women workers". (Dixon, 1978, pp.89-90).

Due to the introduction of yield increasing techniques such as chemical fertilisers, herbicides and pesticides, large number of poor women have lost their neagre source of income. (Nelson, 1979, p.61) Banerjee,1985,p.8; Kishwar and Vanita,1984,p.17). A study conducted by ICRISAT, an International Crop Research Institute in Hyderabad, quantifies this phenomenon. Yet there has been no attempt at training and upgrading of skills of these women in order to absorb them in agricultural extension, e.g. in the job of spraying the pests and weeds. (Banerjee, Ibid).

In subsistence agriculture, where manuring involves collective head loads of cow-dung, converting it into fertiliser and making numerous trips with head-loads to the fields, and sprinkling it there by hand, it is mainly women from peasant households who do this job. But as soon as the family can afford chemical fertilisers and

insecticides, such jobs as spraying these on the fields with machines become exclusively for men, usually hired labourer. Women labourer are considered unfitted for the job even though it requires no specialised skills. (Kishwar and Vanita, Ibid).

Following every slight technological advance, even the few low paid jobs that women are permitted to perform in the fields are being increasingly denied to them. (Ibid). In earlier days, when fields had no direct access to water, women were active in irrigating the fields. However, now the better-off land owners have acquired diesel pumps and manual labour is not required for this activity. (Kelkar, 1985, p.9). For e.g. a study in the Western U.P. village points out that women have been eased out of jobs, as tubewell irrigation replaces manual irrigation. Earlier women were active in this occupation. Now that diesel pumps have been installed and are sending water directly to the fields, women are not allowed access to the new irrigation technology, such as operating the tubewell. As this simple technique came in, field irrigation began to be considered a skilled job and therefore, better paid. As it became less labour intensive and better paying, it passed on to men. (Kishwar and Vanita, op.cit.)

The labour saving techniques or post production innovations (rice mills, reaping machines, combine harvesters) have negative impact on the women of peasant households.

Grinding work or wheat or hand pounding rice once gave employment to millions of women in the rural areas.

....

But with the coming of simple indigenously produced rice and flour mills, most women have been deprived of this occupation. (Ibid, p.18). Harris has also observed that in South India, rice mills employing male labour and thus decreasing employment for landless women. (Harris,1977). Singh in her study on Punjab, observed that with technological changes, women were involved in the processing and marketing of agricultural products (like grinding of wheat and pounding of rice) have virtually disappeared from these industries, as most of the work is now being done by machines. (Singh, 1980).

Furthermore, whenever a new employment is created as a result of such mechanisation hardly ever benefits women. If anything, it systematically excludes them. It is unheard of for a woman to operate a wheat or corn grinding machine, even though the task is simple. Even more rare would be for a woman to be given a job in the local industrial unit and workshops where these machines and implements are manufactured or repaired. All that machines for these women to do, once the grinding process is mechanised is to sit outside the flour mills and hand pick little pieces of grit from the wheat or corn before it is ground. This is a far more peripheral task and involves only a tiny number of women. (Kishwar and Vanita, op.cit.).

Gita Sen, in her study on the Haryana, Punjab and Thanjavaur, found that some of the tasks that women traditionally did have now been mechanised. To the extent that reaping machines have been introduced, they have displaced women labour from traditional tasks. (Sen,1981,p.46).

Wheat threshers have displaced a substantial amount of labour, some of which are casual women workers. (Dixon 1978, p.89). The new jobs have been created due to new technology, but most of these jobs are, however, for men. For e.g. the widespread adoption of combine harvesters will have a serious effect on rural employment. (Dasgupta, 1977).

The introduction of tractors will also displace female labour because they could be used for activities such as levelling and manure application as well as plowing. (Dixon, op.cit. p.89).

The commercial farming (cash cropping) of the green revolution has had an additional important effect on Indian women. Irene Tinker has argued that the greatest inputs of technology in agricultural production have been on cash crops- Such as bananas, tea, coffee, cotton etc. Men are more heavily involved in the production of crops for market than women are, they are the beneficiaries of the more advanced technology which also draws land and male labour to the production of cash crop. (Charlton, 1984, p.87).

Commercial agriculture has often discouraged initiative for women's subsistence activities, who headed many of the households and even when married, provided cash income as agricultural labourer in addition to crops from their gardens, were driven out of production with the encroachment of cash crops introduced by green revolution technicians. Whereas men saw their interest being improved by wage labour available in the mechanised farming sector, women lost control over

variety of crops that had been the mainstay of their subsistence activities. (Nash, 1977, pp.161-182; Charlter op.cit.p.90).

All the above agricultural innovations have an adverse impact on the women of landless and small-cultivator households, that is. displacement of women workers from their traditional occupations.

Impact on the women from small cultivator and large cultivator households -

While agricultural technology is likely to increase the overall requirements for labour on the farm, it is also likely to increase the family income on the one hand, the increase in labour needs would act as an inducement for the more intensive use of the labour of family women on the farm. On the other hand, there would be a tendency for the women to withdraw from manual work in the fields due to family prestige considerations if the family can now afford to use hired help instead. (Agarwal, 1984, p.A-41).

Studies of farm households in the Punjab and Haryana, Andhra Pradesh and Thanjavur, where modern agricultural technology is in use - show that when the family reaches a certain level of income, the women are made to withdraw not only from working, but also from managing the farm. In fact, there seems to be an iron law developing which states;

" A rise in family income means a withdrawal of women in the family from the labour markets and the increased exploitation of women labourers."

(Adiseshian, 1985, p.2)

.....

A negative association between the family's socio-economic status and the involvement of family women in manual field work has been noted, for instance, by Epstein (1962,1973) in Karnataka, Singh (1980) in Punjab and by Vanamala (1982) in Andhra Pradesh.

The tendency of family women to withdraw because of the 'income effect' of HYVs appears to have offset the tendency towards a greater involvement of family women as a result of the 'labour need effect'. (Agarwal, 1985, p.86). Women, of economically well-off families, have an additional work burden as they now have to put in long hours cooking for the hired labour, where providing atleast one meal is customary, especially during the peak season. (Randhawa, 1975; Mencher and Sardamani, 1982). In other words, it is possible that while women withdraw from field-related work they are forced to spend more time on non-field related work. (Agarwal, op.cit. p.A-49).

In the stratified society in India, it is the land owning class of caste Hindus who define the dominant values. In the traditional society, caste Hindus did not allow their women to work in the fields or do other manual work outside the house. That the majority of women cling to their household role that 'women are supposed to work inside the house' indicated two trends. First, women have internalised the oppressive norms of their domestication and seclusion and uphold the inequality of their sex roles, justifying it as natural and sanctioned by religion and social norms. The poor women are inclined to share the prestige values of class and caste groups who do not allow their women to work

outside the house. Second, there is a mystification caused in the process of the Green Revolution by the assumption that as women cannot work outside the house, so they cannot handle technology. In other words, the new agrarian technology has used the feudal practices of domestication and seclusion of women for increasing capitalist relations of production in the country-side. (Kelkar, op.cit, pp.8-9)

The new agrarian technology has an adverse impact on the women of the agricultural households -

- i) It has resulted in displacement of women worked from their traditional occupations;
- ii) A rise in the economic status of the family (due to modern technologies) leads to withdrawal of women workers from working and also from managing the farms and are forced to engage in non-farm activities.

## II. Marginalisation and Pauperisation of women workers -

The planners and policy makers have paid inadequate attention to the role of women in technology. Rural women have been totally ignored by the modern and imported technologies. (Ahuja-Patel, 1979, p.1552). The household approach in development planning reduce women's work to the status of unpaid household help and intensified rural women's 'marginalisation' and 'pauperisation'. (Kelkar, 1981, p.16).

Women's participation in production tends to be grossly underestimated as a consequence of the non-involvement in decision-making and lack of training in the technological process in agriculture. This has led to a

socially-determined classification of work which has had an adverse effect on the nature of women's activities and their roles. The sectors of agriculture where technological innovations have come tended to be labour displacing and the first to be affected have been women. (Kelkar, 1985, p.7).

Men appropriate the knowledge, skills and services of the new agrarian technology, leaving women to do primitive, non-technological and non-wage subsistence tasks. In this process, the invisibility of rural women as producers of the economy is enhanced and they increasingly lose ground in traditional economic and decision making roles. There is a tendency towards the 'housewifisation' of women in rural development programmes - the object being to help rural women become a 'good wife', a wise mother, a competent house wife and a responsible member of the village community. (op.cit. p.6).

In the agricultural operations men work with machines while women do mainly manual work. Women workers do not have access to technical training and technological knowhow. (Castillo, 1977). Women are given only those tasks which cannot be done by machines or unpleasant. The tasks considered suitable for women are often unskilled, low paid and unpleasant. (Sharma, 1985, p.6). Gita Sen, in her study on women workers in Haryana, Punjab and Thanjavur, found that the effect of the new technology has not been so much to push women out of agriculture altogether as to narrow the range of tasks done by them and to place them at the lower end of a hierarchy of permanent and casual labourer. (Sen, 1981, p.47). Vina Mazumdar is of opinion that in India's rural areas women work practically as 'bonded labourers' for manual operations

in the fields, and that they work longer hours with primitive implements and facilities. (Mazumdar,1975). Govind Kelkar, in her study on Hamirpur Ruru found that women (and children) carry out the back-breaking task of transplanting paddy, while men concentrate mostly on the job of picking seedlings, which is considered skilful and demanding application of physical strength. Men receive more wages and their jobs are graded higher. However, women's work is perceived as 'non-specialised' by both men and women and this contributed to the formulation of a part of the 'house worker ideology' that views women's productive work as an extension of household work. (op.cit. pp.6,8).

Thus, the new technology has been more labour saving for men, but for women it has meant more drudgery.

### III. The Increase in the burden of Women's work -

The marginalisation of women's roles also takes another form. The change in women's position as the result of agricultural changes does not necessarily mean a decrease in labour participation. Women's work usually remains 'integrated' into the agricultural system. But the integration is not central but marginal to the process of development. When the agricultural changes involve both additional labour intensive work and higher productivity work, it is the men who are drawn into the higher productivity areas. Hence women's work load can increase side by side with the introduction of 'improved methods'. (Heyzer,1986, p.114).

Palmer has shown that the present methods of

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introducing commercial crops and technological improvements in agriculture frequently have the effect of increasing women's work burden. (Palmer, 1977). She argues that there is a demand of HYV technology as extra effort which is required in the following men's and women's tasks : for men-more careful and more frequent land preparation; harvesting a thicker crop; for women - increased transplanting and weeding work; applying chemicals; increased harvesting and processing work. (Palmer, 1978 ; Dixon, 1978, p.86). Bina Aggarwal, in her study found that in Tamilnadu and Orissa, family women worked more than before in the fields with the introduction of HYV rice; where women are working more it is first of all likely to imply an overall increase in their workloads, since the women would continue to be responsible for non-field related work, including house work and child care. (Agarwal, 1984, p.A-49).

Irene Tinker has argued that due to the introduction of 'cash cropping', men are more heavily involved in the production of crops for market. Women, in addition to their work in the subsistence fields, also work on their husband's cash crops, thus resulting in increase in their work-burden. (Tinker, 1984).

Palmer points out that, although women as a whole undertake the day-to-day cultivation tasks and take part in the harvest, the hard and seasonally peaked post-harvest tasks for which they are largely responsible are often done by women of the landless classes in the form of casual wage labour. (Op.cit.). The peak season work-load is also

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heavier on women than men. (Agarwal, 1985, p.73). For instance, in the peak wheat harvest season adult women in Haryana spend an average of 15-16 hours or more a day on arduous manual work at home and in the fields and get little time to rest, whereas the men do no house work and are able to take some rest in the afternoon, and perhaps even have a game of cards. (Chakravorty, 1975).

Even of economically well-off families, women have an additional work burden as they now have to put in long hours cooking for the hired labour, where providing atleast one meal is customary, especially during the peak season. (Randhawa, 1975; Mencher and Sardamoni, 1982). When family income rises, hired labour rarely substitutes for women's work in cooking, etc. even in the economically well-off rural households.

Even though an increased burden on women is not inevitably a result of such projects, it is generally acknowledged that too little has been done to devise appropriate equipment that will facilitate the agricultural tasks of women.

#### IV. Wage-disparity between female and male wage earners -

With agricultural modernisation, 'class and sex polarisation' has increased and wage disparity between men and women is widespread. (Omvedt, 1981, p.14; Kelkar, 1985, p.5; Brandtzaeg, 1981, p.1921; Agarwal, 1984, p. A-49; Sen 1981, p.47; Sharma, 1986, p.6; Jose, 1984, pp. A-93 to A.103, Dixon, 1978, p.67). In India, women are generally paid 40 to 60 per cent of the male wages and are given the more labour intensive tasks like weeding, transplanting and harvesting. (Sharma, 1985, p.6; Kelkar, op.cit). There are differentials in wages for the same jobs and lower wage rates

for jobs that are traditionally done by women. (Dixon, op.cit).

The following table will indicate an average daily real wage earnings from agricultural operations in selected areas -

Table III : An average daily real wage earnings from agricultural operations for members of rural agricultural labour households in selected States, 1964/5 prices. (Rupees).

State	Women		Men		Children	
	1964/5	1974/5	1964/5	1974/5	1964/5	1974/5
Andhra-Pradesh	0.85	0.76	1.21	1.03	0.65	0.62
Haryana )		1.63 )		2.00 )		1.06
Punjab )	1.45	1.41 )	2.13	2.65 )	1.04	1.42
Tamil Nadu	0.85	0.79	1.39	1.24	0.70	0.53
Uttar Pradesh	0.93	1.07	1.10	1.39	0.83	1.00
West Bengal	1.36	1.14	1.81	1.40	1.03	0.84
All India	0.95	0.88	1.43	1.26	0.72	0.71

Source : Government of India, 1979, Tables 3.1 (a) and 3.4 (ed.) in Iftikhar Ahmed's "Technology and Rural Women : Conceptual and Empirical Issues, 1985. p.97.

The above table reflects the gloomy picture on the employment front by considering the question of the earnings of agricultural labourers. It reveals that between 1964/5 and 1974/5 in all the 'selected' States there was a rise in daily money wage earnings from agricultural wage work. But the increase in daily money wage earnings has not been in keeping with the rise in prices. In real terms, in West Bengal, Tamil Nadu and

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and Andhra Pradesh, there was a decline in daily wage earnings for both women and men. The exceptions were Uttar Pradesh, where there was an increase for both sexes, and the Punjab, where there was an increase for men but a decrease for women.

An All-India disparity between the daily earnings of women and men belonging to labour households in agricultural occupations has increased by approximately 50 per cent between 1964/5 and 1974/5. Although the wages in absolute amount are high in Uttar Pradesh, Haryana and Punjab, yet it is important to note that the rate of disparity between the wages of women and men nearly doubled in Uttar Pradesh and trebled in the case of Punjab and Haryana between 1965 and 1975. (Rural Labour Enquiry, op.cit. pp.102-103).

Women have a limited experience of modern agricultural production. Their low access to modern agricultural technology leads to a decline in their earning power which then provides the material base for sustaining the patriarchal family system. (Omvedi, op.cit). Another factor that contributes to the low wages of women is the practice of defining a work day as seven to nine hours. Since many women cannot report on time for work because of household responsibilities, they may lose up to half a day's pay although only an hour late. (Wixon, op.cit.p.68).

The logic of superior and better paid work for men derives from the fact that they are assumed to be household heads and thus ultimately responsible for the family. Women's work is ignored as unpaid household work and their

contribution to production is regarded as 'secondary' or supplementary to men's contribution. This breeds in the males superior attitudes as they come to regard themselves as "the representatives of a new enlightenment." Women tend to accept being treated as inferior, both at home and in the labour market. (Chinnery, 1976). This social reproduction of values which devalues women's work, gets perpetuated and women get socialised into accepting their dependency on men. (Kelkar, op.cit. p.6).

V. The weakening of women's authority :- In household subsistence agriculture, women have considerable authority and decision-making powers by virtue of their work participation. However, with the introduction of new technology and the extension of cash crop production, the role of women change. The household member who gains first access to the productivity package (i.e. the new technology, credit, information, bureaucratic linkage, etc.) is usually the male head of the household.

The increasing commercialisation of agriculture, supported by enormous government investment in terms of systematic research and skilled personnel, has had a differential impact on men and women because women have been largely excluded. (Heyzer, op.cit. pp-113.114).

The socially controlled sexual division of labour is a problem of social structure. Rural and agricultural development programmes have tended so far to ignore women's role in productive and reproductive activities. (Kelkar, op.cit. p.11). Sawhner stressed that though large masses

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of women are engaged in agriculture, they do not have access to new knowledge, technology and other services to improve their performance and that access to knowledge and technology for the agricultural tasks which the women perform must be provided to women along with men. (Sawhner, 1982, p.28; Dixon, op.cit. pp 85-6). Kelkar in her study on Etawah District found that, recently, a need has been felt for the inclusion of women in the agricultural extension programmes, but not a single programme of the extension scheme of agriculture for women has been conducted in the Mahila Extension Service Centre in Bakewar. The only programmes that have regularly been conducted are limited to house-keeping and child care. (Kelkar, op.cit. p.11). Ahuja-Patel and ILO Report has pointed out that few girls are enrolled in technical and vocational education in most of the developing countries. (Ahuja- Patel, 1979; ILO Report, 1975). With regard to access to agricultural training Boserup and Liljencrantz point out that in nearly all countries agricultural training at low, middle and high levels is given to men only. This of course, produces male instructors- who in turn address themselves to the male farmer, overlooking and disregarding women. (Boserup, 1970; Liljencrantz, 1975).

As a result, women have remained in subsistence agriculture while the men are being drawn into the technically advanced sectors. It act as a detriment to the women as their decision-making powers and weakened. (Hyzer, Ibid).

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Undertaking a large and often a disproportionately large share of the households work load, or making a significant contribution to household income, does not necessarily give these women greater access to cash income or to food and other consumption items, or lead to their greater participation in the family's decision-making process. (Agarwal, 1984, p.A-48). Brandtzaeg found that in the process of modernisation and technological change, women suffer a loss of economic authority and general status. (Brandtzaeg, 1979).

a) Participation in the decision-making process -

In Hamirpur Ruru, in the district of Etawa, Kelkar found that although women's jobs are absolutely essential to the existence of the family but it does not provide them with much autonomy concerning decisions in the home or even with regard to the disposition of their earnings. Out of the 58 households interviewed, only in 11 families (consisting of widows or own land in their names or otherwise provided for the family) women participate in decision-making and exercise some kind of control in marketing.

With the introduction of cash crop for the market, women have no decision-making power regarding the requirement of grain at home or selling grains, thereby losing their authority at home, (Kelkar, op.cit. pp. 6,7,10).

b) Control over cash income -

Although women undertake a disproportionately large share of the family's work burden, but it does not necessarily give them access to or control over household cash income. (Agarwal, Op.cit,p.74). Kelkar, in her study found that in

in almost all the cases, money is kept with the women, but they have no control over it. (Kelkar, op.cit,p.10). Chakravarty on the basis of her study of 5 villages in 3 Indian States observed that even where the wages are paid to the women, these were taken over and controlled by the household men. (Chakravarty, 1977).<sup>1</sup>

Women's access to cash income is important to take into account because evidence indicates that where they have some discretion over cash expenditure, they usually spend the money on family needs, while men often spend a good deal of what they earn on their personal needs such as liquor, cigarettes, etc. (Gulati, 1978; Mencher and Sardamani, 1982) rather than on the needs of women. It is note-worthy that in the heart of the green revolution, viz., Punjab, while there have been considerable improvements in technology handled by men, there has been little improvement in the women's kitchen apparatus, even in the economically well-off households. (Pathak and Bining, 1983, p.9; Sarin, 1983, p.13).

In other words, the extra effort put in by family women in the field with the introduction of HVV, cannot automatically be assumed to bring in benefits to them in terms of improved standards of living.

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1. That women often have little control over household earnings is noted too by Hyzer (1981) in the context of landless plantation labour in Malaysia; and by Palmer (1980) among rice cultivating small peasant households in South Korea.

VI. Limited participation innnewly-formed organisation -

Productivity changes also involve the creation of bureaucracies and new forms of organisation. These new institutions give more prominence to men rather than women. Besides the in-built bias of these institutions, women's participation in them is hindered by their work burden. Much of women's household labour such as fetching water, fuel and general home-caring takes five to six hours and their technical base remains low because it is not profitable in monetary terms from the point of view of planners to develop improved methods in these areas of work for the rural women. (Heyzer, op.cit. p.114). The commercial farming of the green revolution has had an additional important effect on women. The new type of farming, far more than the old, involves direct contact with dealers, commercial firms, and government agencies.

- "all the world of public commerce and the market from which women of 'good family' are effectively barred". The supervisors, managers, and technicians of the green revolution are men. (Dixon, op.cit. p.90).

VII Lack of alternative central roles -

Frequently, development planning has neglected to offer women alternative central roles when their traditional roles are eroded as a result of change. Recently, there have been pressures to take account in the planning process of some of the social consequences resulting from these changes. There have also been attempts to build up 'delivery or support services'

to women as part of rural development. This process has brought about the arrival of health, educational and nutritional facilities. Some of these facilities, those that respond to a priority need, may, like the need for clean water, partly compensate for other adverse effects. However, in many other cases, women develop a new dependency on the agencies that deliver the resources. (Hyzer, op.cit. p.114).

VIII. Health Hazards of modern agricultural technology -

More and more studies are coming out showing health hazards of pesticides, chemical fertilizers, etc. used in 'modern' agriculture.

Pesticides inhaled or absorbed by skin while spraying or working in fields where pesticides are used can generate various types of poisoning. The number of reported deaths from pesticide poisoning is 10,000 per year in the third world countries out of which 1/3 are from India; according to the recent report of International Development Research Centre, Ottawa. It also says the Indians have highest tissue level of DDT in the world, i.e. 12.8 to 31.0 parts per million. Studies of 70 patients of acute pesticide - poisoning in Gujarat by Baroda Medical College and Civil Hospital, Surat, have shown that agricultural labourers are not provided with protective devices while spraying pesticides. Various studies conducted by the Indian Toxicology Research Centre in collaboration with the neurology department of K.G. Medical College, Lucknow have shown that one-fifth

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of agricultural workers involved in spraying pesticides had impaired eye-sight following muscular degeneration. In the cotton growing areas where the use of pesticide is more frequent cases of stunted growth of their children, deformities, disease of liver and nervous system, blindness and other toxic manifestations including cardio vascular and intestinal problems are found on a large scale. Pesticides have extremely detrimental effect on the health of pregnant women and foetus. (Patel, 1984, p.3). Pesticides cross the placental barrier, affect the foetus causing malformation or disease like byssinosis and begassosis. (Mukherjee, 1985). In the absence of safety measures like use of gum-boots and masks, sometimes workers even loose their lives. Carcinogenic effects of some agricultural chemicals are also established by many researchers. (Bhara,1977,pp.311-321; Heyneman,1971, pp. 303.313).

An increasing number of women farm workers face serious toxic hazards due to malnutrition and parasitic disease, which increase susceptibility even at low levels of exposure to fertilizers, insecticides and pesticides. In Maharashtra, Punjab, Tamilnadu and Gujarat, where maximum use of pesticides and fertilizers is made, farm women are constantly exposed to this hazard. (Mukherjee, op.cit.).

Working in the paddy fields, in operations such as transplanting exposes the women to a number of health hazards such as increased susceptibility to intestinal, and parasitic infections, splitting heels, pain from

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leach bites, rheumatic joints and arthritis. (Mencher and Sardamoni, op.cit.). An UNDP Report (1980) also notes that in Asia there appears to be an association between working in paddy fields and gynaecological infections. This is an additional cost which both the farm family women working in the fields and the women agricultural labourers employed on a casual basis, have to pay. (UNDP, 1980, p.226).

#### IX. Increase in Dowry Menace

It is interesting to point out that in several villages of the Green Revolution belt, dowries have been increasing rapidly. This fact is brought out clearly in a recent study "Dowry among Jat Sikhs in Punjab" by Pritam Singh. The study says -

Before the advent of the modern consumerist culture, the dowry included, apart from gold, a mare or horse, and clothes. Now apart from gold, the dowry items include car, motorcycle, scooter, T.V., Two-in-one, refrigerator, furniture and clothes. Though some cash is given, dowry in kind is preferred to that in cash because the groom's family still wants to keep up the pretence of not being greedy for money.

Among the peasantry in the Green Revolution region, the status of the people is expressed by the size and value of the dowries, they can afford to pay on a broad estimation, even among the poor peasants costs about Rs.25,000, middle or upper middle farmers costs about Rs.50,000; rich farmers costs about Rs. two lakhs and the things offered as dowry include all the modern household gadgetry that marks a matching marriage in any big town or city.

The marriage market is one of the places where the Green Revolution turns into Gold : (Dogra, 1984).

Marginality and low wages are prevalent among rural women throughout the region of the Green Revolution in India. Most of the manual and non-technological work is done by women, while men operate the new agricultural machines and control the inputs as well as the produce. Women are not recognised for their productive role in the economy. Their reproductive role is considered a natural one and taken for granted. Both men and women are socialised in a manner which prescribes the public and economic spheres as the 'male sphere' and regards the domestic as the non-productive, non-economic female sphere. The technological development has maintained and perpetuated this distinction through the process of social reproduction i.e. reproduction of the conditions sustaining a social system. For the women in subsistence agriculture it implies the reproduction of exploitative relations of production, gender related differentiation in access to the new agrarian technology, the relationship of domination and subordination between the sexes and women's low position in the family and society.

The politics of agrarian technology often turns out to reinforce the 'androcentric development status-quo' and the question remains, how do we check the process of underdevelopment of women? How do we analyse and respond to many conflicts between the potential value of technology and its actual effects on women in subsistence

agriculture? The ideology of planning encourages an image of agricultural women in which the technological and scientific solution of the problems of development are constantly generated by an expert group of planners and policy-makers but are not accepted by the 'backward' peasant women. It is assumed that the reasons of acceptability and non-acceptability of development programmes are to be found in the ignorance and conservatism of the rural women. (Kelkar op.cit., pp.12-13).

The problem cannot be located in the technological innovation per se, since what is often inappropriate about the innovation is not its technical characteristics but the socio-political context within which it is introduced. This gives the innovation its specific class and gender bias and mediates the distribution of costs and benefits from its adoption. Thus, for example, the impoverishment of many rural households with the introduction of the HVV - irrigation 'package' would be traceable not to the 'package' in itself but to the pre-existing unequal distribution of land and of political power between households, which has enabled a privileged few to monopolise access to the new inputs and practices.

The fact that it is women who often tend to lose more or gain less from a scheme than the men of their class again relates less to the technical characteristics of the scheme than to the ideology that legitimates and reinforces women's subordinate position, economically and socially, both in the household and in the larger society.

Little attention is paid and few resources are usually allocated to developing and promoting technologies specifically to suit the poorer rural women's needs relates to their lack of political and economic control and thus their inability to influence the direction of technological change in their favour. (Agarwal, op.cit, pp. 112.113).

## B) Tanning and Finishing Industry

The tanning and finishing industry in Tamil Nadu provided employment to 15,592 persons in registered factories in 1978-79. The industry exported Rs. 2,575 million worth of leather and leather products in 1978-79 which accounted for 70 per cent of all leather exports from India in that year.

Until the early seventies, the industry was highly labour intensive and was producing predominantly semi-finished leather (SFL) for export. The last few years of the decade of the seventies, however, witnessed capital intensification of the tanning industry. Movement from labour intensiveness resulted both from substitution of capital for labour in the tanning stage and installation of machines in the next, i.e., finishing stage. (Usha 1985, P,167).

### Production Process

There are three stages of production in the industry from raw to semi-finished leather known as the tanning stage, from SFL to finished leather, the finishing stage and from finished leather to leather products, the products manufacturing stage. There are eight pretanning processes - soaking, paste lining, dehalving lining, fleshing, sorting, delimiting and scudding. Soaking and lining can be done in power operated drums or manual operated pits. Paste lining and sorting should be done by labourers only. Dehalving, fleshing and scudding can be executed either by machines or by human hands. Then the leather is tanned. After tanning the leather is set and then dried. Setting can be done by a machine or a manual labourer .

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The workers in the tanning industry can be grouped into four categories on the basis of the tasks performed by them - hand workers, unskilled workers, machine operators and helpers (Ibid, p.167).

Technology:

In 1972, there was a boom in the export market and it led to unprecedentedly high demand and high prices for Indian SFL. Total earnings from leather exports increased from Rs. 102 crore in 1971-72 to Rs. 171 crore in 1972-73. This encouraged the Indian government to go in for the export of better processed finished leather and leather products on a large scale, restricting the exports of semi-finished leather. ('ETC Circular' No. 105/73, 1973).

The tanneries have intensified the use of capital not only by installing finishing machines but also substituting machinery for labour in the tanning stage, for the pre-tanning processes. In the finishing stage, there is no choice but to use machines, for the pre-tanning process however an alternative between hand and machine processing techniques was available. But machines were preferred to use for reducing the length of the production cycle, especially that of the intermediate stage to less than 20 days by the use of capital intensive processes, to continue efficiency in the industry. By installing machines the human requirement is reduced by more than 50 per cent in each operation. In other words, instead of eight workers only three workers are employed for an operation for turning out 1,600-2,500 spins per shift. (Usha, Ibid, p.168).

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As a result of this capital intensification 1,842 workers were thrown out from the pretanning processes. Employment in the registered factories decreased from 11,038 in 1971 to 9,186 in 1973-74. (Annual Survey of Industry, 1971, 1974). As the labour employed in these processes were mostly technical/traditional workers. They were the affected lot. In other words, the substitution of capital for labour in the pre-tanning processes led to the traditional workers losing their employment. (Usha, Ibid, P.169).

Impact of mechanisation on the women labourers:

Given the fact that the women workers come only from the traditional leather working castes, even if one includes the female employment in the unorganised sector of the industry also, the fall in the proportion of the traditional workers in the industry is still significant.

There is a clear division of work between male and female workers. Women are primarily employed for two set of jobs: 1) Picking, dusting and drying work which has to be done mostly outside the factory premise and 2) breaking myrobalan nuts (an essential ingredient in tanning), sweeping, washing, collecting water, etc.).

The vaniyambadi in North Arcot (Tamil Nadu) sheep skins are tanned and finished extensively. Sheep hair is valuable as wool and hence almost all the tanners retain the work. For removing the wool, the women are paid 3-4 paise per skin and a woman can work on 100 skins in two hours. For dusting and cleaning the wool, they are paid Rs. five per eight hours shift. In Vaniyambadi women are employed for both the sets of jobs.

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On the other hand, in places, where goat skins are tanned (goat hair is not so valuable), women are employed mainly for the odd jobs mentioned in the second category above. Here a few large tanneries employ women for the pre-tanning process of soaking the skins. But they form hardly one-tenth of the total work force in these tanneries.

In 1980, in aggregate, the share of women in the total work force has decreased from 5.89 per cent in 1972 to 5.10 percent (Ibid, P-170). The majority of women workers were working in the pre-tanning process. But due to the introduction of machinery, the majority of women workers have started losing their jobs which will also result in loss of their <sup>meagre</sup> only source of income.

Therefore, an industry that was once a haven for traditional workers will, with modernisation and vertical integration, cease to be one.

## II. The Leather Goods Industry:

The Leather goods industry is a new industry to the region. It illustrated the process of skin formation and the onset of sexual division of labour. Secondly, it is an industry where India is competing not only with other developing countries but also with industrialised countries and in a field where the entire initiative is in the hands of the (Banerjee, 1984, P.38).

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Organisation of the Industry:

The industry mainly use female labour. Women had been hired without any requirements of specialised qualifications and had been given sufficient training at the workshop to do their particular jobs. There were no promotions but this may be because of the rates of pay were more or less the same in the majority of shops and also because none of the firms had worked for more than two-three years atleast in the present form (Ibid, P 38).

MECHANISATION IN THE INDUSTRY:

The firms have several leather sewing machines which may fairly well-finished bags with good edgings, corners, etc. In order to do this, the woemn workers not only require a fairly high level of skill but also physical force and a lot of control over the machine. The modern equipment for dyeing them and stretching the leather, cutting it and stitching it. Semi-skilled women workers collected leather pieces, cut to measurement by machines and sorted and arranged them. The mechanists look after all the machinery including the cutting and stitching machines. Embosser women have to face the lettering etc. at right places. The job is mainly tedious and repetitive but has not been mechanised. (Ibid, P.40).

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IMPACT OF MECHANISATION ON THE WORKING WOMEN:

Since there is no tradition of this work in the region, there is no particular reason why women should be specially preferred for the jobs. It is, due to the following factors:-

1) Lower wage rates for women workers: - The male workers get better salaries than women because machines has increased their productivity. Monthly earning of a woman worker is on a level much below the earnings of a lowest grade employee in the organised sector. But given the rates of pay, it is likely that available male labour would not have been acceptable to the management. The reasons why such rates are acceptable to ~~women~~ women are rather involve obviously there is a dearth of alternative jobs for women. None of them have any specialised training in any skills.

2) Working conditions in the factories:

Mirmala Banerjee, in her study found that none of the firms provided any facilities for women except a toilet. There had been no instance of paid leave for sickness or maternity given to any of these women. Some firms hire mainly young unmarried women. There are a few who got married while working in the firm and they are afraid that they would loss their jobs when they have children.

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Absenteeism is severely dealt with especially when an order is to be met in time. There are a couple of cases of dismissals when a worker had been absent for couple of days.

What is more, techniques used by these firms put enormous physical strain on the workers. Infact women complain that with the tools given the work is difficult. The machines are hard to move, stitching bits by hand require a lot of struggle.

Health Hazards - Leather is easier to work when slightly damp but then the acid and dyes in which it has been soaked is hard on the hands and eyes of women workers. The workers claim that management took no notice of their complaints and is very severe about loss of quality. (Ibid, p.41)

Generally, these women knew little about where and how to look and complete for alternative jobs, on the other hand, the level of family incomes made it fairly imperative that they secure and keep their jobs. So their lack of skills, and knowledge coupled with their desparate family situation led them to accept whatever is available (such as more physical strain, lower wages, adverse working conditions, and health hazards) in a stagnant job market.

C. BIDI INDUSTRY

A large group of women in the unorganised sector are engaged in feeding the production of larger factories from their homes. Employers in bidi, matches industries prefer to pay women less as workers feeding their unorganised and unregulated factories. The largest of these is the 'bidi industry' and consists of factories, small workshops as well as home production. Wages are on pick rate basis. Working hours and bonus payments are unregulated women working at home are called 'Ghar khatas'. This is a peculiar feature of the bidi industry and is prevalent over many parts of the country.

According to the Census of 1961, out of 9 lakhs bidi workers 5.5 lakhs belong to the household sector. The bidi and cigar industry where employment of women exceeds men, (77.3% in Andhra Pradesh, 60.9% in Maharashtra, 47.5% in Rajasthan) is the worst of the sweated industries. (Towards Equality, Report of the Committee on the status of women in India, 1975, p.174). A report on bidi workers in Sinar (Maharashtra) observes that out of 10,000 bidi workers, 65% are women who generally work in their homes and are paid at the rate of Rs.4/- per thousand bidis. The total labour time required for rolling thousand bidis ranges from 12 to 16 hours.

The Committee appointed by the Government of Andhra Pradesh in 1969 for revision of minimum wages in the tobacco manufacturing industry reported that the seasonal industry of tobacco leaf handling employs nearly

a lakh of workers. The factories work from February to July for a period of 60 to 180 days. The majority of workers are women. The same is true of the bidi industry. (Towards Equality, Ibid, p.174).

#### Important Industry

The 'leaf tobacco industry' occupies an important place in the economy of the country. The Government of India derives about Rs.6000 crore by way of excise duty annually. Export of tobacco will account for a foreign exchange, earning to the tune of Rs.120 crore a year. Nearly 400 big and small companies are operating in this industry in which 1,25,000 workers are employed, of whom 90 per cent are women.

The ITC (Indian Tobacco Company), is a worldwide tobacco manufacturing organisation. The company earned a gross profit of Rs.17 crore in 1981 and Rs.16 crore in the year 1980.

The ITC, ILTD as well as BAT, NTC and Golden Companies have begun closing down their units even though their business turn-over is increasing and they are seeking other methods to get their requirements through middle-men traders. By such closures, already 45,000 workers have been rendered unemployed including in leaf and cigarette manufacturing.

On the top of this the employers are now resorting to mechanised processing of tobacco by installing green leaf threshing plants. (The voice of the working women, 1982, p.8). About 90 per cent of these displaced employed are Tribals and Harijans and 75 per cent of them are women, who are the weakest section of our society and need protection from the Government. (Ibid, 1983, p.6).

Impact of mechanisation on the women workers -

The introduction of new technologies has deprive women of vital income, shifting jobs for which they have traditionally been responsible to men. This fact is also applicable to the tobacco industry.

In the tobacco industry a large number of women have been employed in the rolling of 'bidis'. The trend is downward now with modernisation of the tobacco industry. Technology and modernisation of industries have almost invariably resulted in retrenchment of women workers employed mainly in unskilled and semi-skilled jobs."

(Vyas, 1980 )

A serious situation has developed in the tobacco industry in Andhra Pradesh where thousands of women have been thrown out of work due to the introduction of machines in the factories where more than 50,000 women were employed. Already, 6,000 workers, among whom 4,000 women, in the Chirala factory and Parachur Depot have been dismissed. (The Voice of the Working Women, 1983, p.6). In Anaparthi this plan has throws 1500 women stemmers out of work, where stemming operations were being conducted for the last many decades. (Ibid, 1982, p.8).

II.

The IFC is making fabulous payments to the officers and directors, the gross remunerations ranging from Rs. one lakh to Rs. 285,000 per annum. Rupees 57 lakhs are paid to just 44 offic-ers and directors.

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On the other hand, the company has refused to raise D.A. increased the workload and reduced the work force. (Ibid, 1982, p.8). It has been adopting dubious methods to deprive the workers of their wages and other benefits, by making benami purchases outside the depots, then bringing pressure to bear on the depot workers to accept reduced wages. (Ibid, 1983, p.6).

The workers in the industry are reclosing that the Government at the centre and in Andhra Pradesh is interested only in protecting the monopolists at the cost of thousands of workers. (Ibid, 1982, p.8).

Women's low social status, lack of education and other factors have come in their way when competing for better jobs. So when a new technology is introduced, it leads to retrenchment of women workers from their traditional occupations which has resulted in deprive of their vital income.

D            COIR    INDUSTRY

Kerala accounts for about 95 per cent of India's total production of coir and coir products. Coir Industry, one of the three major traditional industries in the State ( the other two being Cashew and Handlooms), provides direct employment to 5 lakhs. About 10 lakhs of people are dependent on the industry in one way or the other.

The majority of coir workers in the State find employment only for about 200 days in a year on the average. Theirs is a life of object poverty, starvation and attendant misery with nothing to fall back on and nowhere to work for the months of the year. The problem is very acute mainly because in the coastal areas of Kerala where the coir industry is concentrated, there are very little opportunity for alternative or supplementary employment. Living below the poverty line, they are subjected to the worst type of exploitation and social degradation.

Low wages and virtual impossibility of continuous employment are at the root of much suffering. Considering the total production of coir and the sizeable number of persons engaged in it, one cannot resist the conclusion that a substantial proportion of the workers are woefully underemployed. No other cottage industry in Kerala employs as many people in different sectors of production, manufacturing and trade as the coir industry does. (Mathew, 1979, pp.1-2).

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Sectors of Activity in the Coir Industry -

1. Retting of Green Husk - The number of husk-retting units in Kerala is estimated at 23,700 spread over 857 villages. The vast majority of these units are small-scale units, but a few monopolists dominate the scene, controlling the major proportion of the trade in retted husks.

The estimation is that about 50,000 workers are employed in retting. The pitiable fact about this 'Unorganised sector' is that workers employed in retting have gainful employment for not more than one week in a year on the average.

II. Hand Spinning - It comprises of about 80,000 hand-spinning households and provides employment to over one lakh of persons. The majority of workers employed in this are female. It is estimated that 90 per cent of the work force in the sector consists of 'women'. They can hardly make a rupee for a day work of 10-12 hours. (Ibid, 1979, p.4).

III. Spindle-spinning of yarn - There are about 24,000 of such units using a total number of 31,000 spindlers. Out of this over 15,000 units ( about 64%) are situated in individual households. Total number of workers employed in beating and spinning of coir yarn in this sector is estimated to be two lakhs. It is estimated that in the spindle-spinning sector, 90 per cent are 'women', of which 20 per cent are girls. According to the Survey conducted by the Coir Board more than 60 per cent of the workers employed in the spinning sector are hired workers. (Ibid, 1979, p.5)

IV. Manufacturing - In the manufacturing sector, the total number of unorganised units employing less than 10 workers is about 2700 which accounts for an estimated 15,000 workers.

The 'organised' sector of coir manufacturing consists of 170 registered factors (in 1975). The vast majority of factories in the organised sector are in Alleppey District. The total number of workers in this sector is estimated to be less than 4,000 (Ibid, p.5).

Mechanisation in the Coir Industry -

One of the serious problems in the coir industry is the introduction of machines in the traditional sector. The main reasons put forward by the protagonists of mechanisation are stiff. International competition from synthetic fibres, non-synthetic substitutes and even coir products made by sophisticated machines in Europe. A study report of the UN Development Project pointed out -

" During the last two decades, West European countries, in particular the EEC countries, have developed a well-organised coir manufacturing sector using imported yarn from India."

( UNDP, 1975, P.V)

The alarming reports circulated by exporters and monopoly manufacturing interest seem to have found some credibility in certain official reports.

e.g. A study by Dr. M.V.Pylee, commissioned by the Coir Board recommended mechanisation :

In the manufacturing sector, there is an urgent need for India to modernise production and manufacture

sophisticated coir products which have a market of about 20,000 to 22,000 tonnes abroad. At present, this entire quantity is produced in Western Europe. If India progressively converts more and more yarn into mats and mattings using modern technology, her products would be cheaper than the European Coir Products and will enable India to capture a sizeable part of the world market fed by European products and thus will help give a boost to our coir exports. (Pylee, 1976, p.8)

On the top of these, the Planning Commission's Task Force on Coir Industry has suggested setting up of a limited number of export-oriented units on mechanised basis for production of creel mats. (Report of the Task Force of Coir Industry, 1973, p-78).

Impact of mechanisation on the women workers -

In the coir industry, at the hand-spinning level, it is estimated that workers put in 33,92,638 man hours in a week calculating on the basis of full employment of 8 hours a day and 280 days work a year, 78,896 persons are actively engaged, but there are 1.19 lakhs workers. (Mathew, 1979, p.6)

In the spindle-spinning also the two processes, extraction of fibres and spinning of yarns, together would give full-time employment to one lakh persons whereas the actual employment in this sector is estimated to be over 2 lakhs. So 50 per cent of the workers are surplus in this sector. (Ibid, p.7)

Now, there is an attempt to introduce mechanisation

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at various levels of production. Therefore, it is necessary to analyse the impact of mechanisation on the women workers -

II) Displacement of women workers :-

In the primary sector of extraction of fibres, if machines are used, 32 workers per 8,000 husks are likely to be displaced. According to rough estimates ( on the assumption of 200 days of work per year), 45, 333 workers out of the total number of 93,333 workers engaged in fibre extraction per beating of husk by hand alone, will be thrown out of employment. This is not merely a possibility, according to information available, the process has started and several women have been thrown out of work.

Similarly, in the sphere of spinning using ratts, if the process of mechanisation which has already started is completed, out of the present employment will be reduced to half and the rest will be replaced to join the ranks of the unemployed. (Mathew, 1979, pp.7-8).

The coir inudstry of Kerala, is faced with a very serious threat. More than 4,000 small-scale handloom coir factories function. In the Ambalpuzha, Shertallai and Vyume taluks. They employ over 20,000 workers, of whom a large number are women. The future of these 20,000 workers is now in grave danger. The majority of exporters face being thrown out of their trade and reduced to pauperism. (Mathew,1979,p.49 - The voice of the working women, 1982, p.4).

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II. Loss of job due to artificial scarcity of the raw material-

When machines were introduced for husk beating the raw material, namely husk which traditionally used to flow from various parts of Kerala to Alleppey, Shertalai and Chirayinkil started to get diverted to the Northern parts of Kerala, particularly, Trichun where machines were allowed to function and where workers were not fully organised. The artificial scarcity of the raw material was created in the traditional coir belt. The monopoly elements who controlled the husk caused havoc to the entire industry. Thousands of workers lost their jobs due to shortage of raw materials. (Mathew, op.cit. p.50).

III. Facilities in the Factories -

The number of women workers in coir factories has been on a continuous decline. The pretext under which women were denied jobs was that "the amount of work done by the women workers is lesser than men". Before 1947 women who were employed as time rate workers used to get about 6 annas ( 37 paise) per day. In 1947, there was a general increase of 25 per cent of the basic wage and women workers started getting 8 annas ( 50 paise) per day. In addition, the rate of maternity payments was raised as a result of increasing trade union and collective bargaining. (Ibid, p.22). Though the increase in wages and maternity benefits was the important provocation for management to employ less women labour the reason given by the employers to the Pillai Committee in 1955

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was that "women workers cannot put more outturn even if they are paid more." (GP Pillai Committee Report, 1955, p.61).

The Report of the GP Pillai Committee pointed out that though the big factories in Alleppey made provision for latrines and urinals, the smaller units had nothing of the kind. Similarly in most of the factories, spittoons were not provided and where these were provided they were not in adequate numbers. (Ibid, p.62). Coir factories have not generally provided canteens to the workers though it is obligatory according to the Factory Act, "where there are canteen there are no canteen management committees. Regarding factory workers on pay rolls are termed also as canteen staff and their pay is claimed from canteen accounts also." (Ibid, p.63).

Health conditions :- The Tharakan Committee Report (1952) made the following startling revelation -

"when they are sick they do not have any facilities for getting medicines from hospitals as these are few and far between. Consequently most of these workers are not actually living but are moving slowly to premature death." (Tharakan Committee Report, 1952, p.15)

Mechanisation has been introduced in the coir industry ostensibly for improving productivity and for meeting competition in International markets. But the fact remains that the major motive for big manufacturers for resorting to mechanisation has been to break the organised strength of the workers. Further, mechanisation provides an easy way to increase the rate of exploitation and possible depress wages by creating a 'reserve army of unemployed'.

E. COTTON HANDLOOMS, HANDBLOCK PRINTING AND WOOLLEN COTTAGE INDUSTRY

The three traditional industries - Cotton Handlooms, Handblock Printing and Woollen Cottage, is a large employer including a substantial number of women. Products similar to those made by these three traditional industries are also made by mechanised and semi-mechanised units. The existing form of production in the traditional sector requires low capital per unit of output and per person employed. The production process requires little energy and is conducive to dispersion and creation of a large number of work stations. The production is indeed widely dispersed.

Although protection to these industries was offered by the Textile Commissioner's Organisation but the result understandably was the opposite of what the strategy desired. The mechanised sector multiplied - drawing in substantial investment resources, while some of the largest cottage industries such as handlooms and hand block printing were squeezed and shrunk causing distress to large numbers.

A study of three traditional industries - woollen cottage, cotton handlooms and hand block printing by IDS (Industrial Development Services) reveals that thoughtless mechanisation in the grab of technological progress has played and is playing havoc with the employment of lakhs of workers + men and women, from the poverty households.

(Jain, 1984, pp 1-2)

Therefore, it is essential to analyze the impact of mechanisation on the status of women engaged in these three traditional industries.

a. Cotton Handloom Industry

The handloom sector is predominantly a family wage market, based on production in household units. The majority of women working in the handloom sector are 'family workers'. (Report on the Women, Technology and Forms of Production, 1984, p.15) Large number of women are engaged in handloom sector either as weavers or as supportive workers in pre-weaving and post-weaving activities. (Bhatt, 1983, p.1). Women are never paid anything for the work they do. (Unpaid family labour) due to the generally low level of income generated in this sector. (Report on the Women, Technology and Forms of Production, 1984, pp.16-17).

Mechanisation in the Handloom Sector -

The Cotton Handloom Industry is acknowledged as the biggest provider of employment next to agriculture. There is disturbing evidence however that employment in the cotton handloom industry is being rapidly snuffed but by the fast expanding powerloom sector within the textile industry. . ( D.Jain, 1985, p.1)

There is a huge expansion of cotton powerlooms - from 80,000 to 4,24,000 ( i.e. by more than 500 per cent) in the twenty year period between 1963 and 1982-1983. The Bombay Textile Mills strike ( which could not be entirely unwelcome to many mill owners) gave an added push to the

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powerlooms. The present number of cotton powerlooms must be 40 to 50 per cent more than the 1982-83 figure of 4.24 lakhs. (L.C.Jain, 1984, p.3).

The latest annual report of the Commerce Ministry (1983-84) provides a measure of the staggering numbers involved :

"The exercise of regularisation of unauthorised powerlooms which have been existing on 31.3.1981 is currently going on. As on 31.10.1983, about 2.62 lakhs powerlooms have been regularised."

Three fourths of the over to 6 lakh powerlooms are concentrated in just six towns (in three States viz. Maharashtra, Tamil Nadu and Gujarat) which do not correspond to the main handloom centres. In 1981-82, these three States accounted for 70 per cent for over one-third of the total powerlooms in the country. (L.C.Jain, 1983).

The Sivaraman Committee estimated that each additional powerloom put out of action six handlooms. (Report of the High-powered Study Team on the problems of Handloom Industry, 1974). Since An additional 2.31 lakh cotton powerlooms had come into existence by 1982-83 rendering 13.86 lakh handlooms idle (according to Sivaraman Committee norm) with unimaginable consequences on employment in the handloom sector. (L.C. Jain, 1984, p.7).

Consequences of powerlooms Development on Employment (including women's employment) in Handlooms -

A Technical Committee of the Government has shown

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that although one handloom provides work for 4 persons, including part-timers, converted into person-year basis are one handloom provides employment to 2.4 persons of whom 0.9 are family labour mainly women in the pre-weaving processes. On this basis alone, the disruption of 13.86 lakh handlooms by powerlooms means that an estimated 28.64 lakh job opportunities were extinguished in the handloom sector upto weaving stage between 1974 and 1981. One half of those who lost jobs or about 14 lakhs were women considering that women also participate in weaving in certain areas besides pre-weaving processes.

Against the loss of 28.64 lakh jobs caused by them additional cotton powerlooms in the post-1974 period compensated the economy to the extent of only 5.58 lakh jobs on the basis of 2.5 persons per powerloom upto the weaving stage women's participation in powerlooms is marginal.

But those who are affected do not convert themselves into person-years. They remain persons - four persons per loom. The really affected persons therefore number 55,44,000 men and women in the proportion of 2:1. (Report of the High Powered Study Team on the problems of Handloom Industry, 1974)

All these tedious details are to highlight the process through which the handlooms have been squeezed out of the market for both the final product as well as raw material affecting their output and employment despite State Policy to the contrary.

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In the displacement caused by powerlooms, women workers are the greater sufferers since whatever compensating employment powerlooms provide goes mainly to men and only nominally to women. In rural, for example, the handloom industry in 1961 was reported by the Census as employing 6,475 persons of whom 1,720 were women, i.e. about 28%. But by 1971, the total employment in handloom had been reduced to a mere 220 ( which included 20 women). This drastic disappearance of the employment in the handloom industry can only be accounted for by a rapid growth in the 'powerlooms' in Surat in this period. The powerlooms themselves in Surat were employing a total of only 539 women in 1971. Assuming ( and it is a big assumption) that these 539 women were part of the 1,720 perviously employed in handloom industry, we have to reckon with the fact that as many as 1,161 women had been removed from employment because of powerlooms. (D.Jain, 1984 , p.2)

The following table shows the trends in employment of women workers in the handloom industry -

TABLE IV TRENDS IN HANDLOOM EMPLOYMENT

(Nos. in lakhs)

States	Total Employed		Women workers	
	1961	1971	1961	1971
Tamil Nadu	4.66	3.60	1.68	0.87
Maharashtra	1.41	0.75	0.60	0.17
Gujarat	0.40	0.12	0.15	0.02
Andhra Pradesh	3.75	2.34	1.53	0.50
Uttar Pradesh	2.52	1.64	0.82	0.69
Total	12.74	8.45	4.78	2.20

Source : Census of India, 1961, 1971.

The above table shows that in the five States as many

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as 2.58 lakhs handloom women workers were displaced between 1961 and 1971. Even a conservative estimate places this loss at not less than 84,500 as against a total of 7,222 women employed in powerlooms in 1971 in the five States. Since 1971, the expansion of cotton powerlooms has been tremendous (more than three fold) and continues unabated and so does the corresponding devastating in the handloom sector.

There is no public policy or social purpose being served in the production of cloth through powerlooms; and that what was being attempted was not technological improvement of the handlooms ( for better quality of weaving or lower cost of manufacture or higher productivity per weaver) but mechanisation for private gain totally contrary to public policy. (L.C. Jain, 1984, p.9)

However, .Ise Baud struck a blow ( though temporary) on anti-powerloom conclusion. Her study of women's labour in the Indian Textile Industry, July 1983 estimated that powerlooms were employing a substantial number of women ( 33 per cent) and were "most conducive to an increase in women's social autonomy (and) the growth of the powerloom sector is a positive development".

A close scrutiny of her study however revealed that Baud's estimates of women's employment in powerlooms were untenable. They were based on a study of powerlooms and handlooms in 3 Coimbatore villages where she found that 33 per cent of the powerloom workers were women. On this slender base, the author extrapolated women's employment in

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powerlooms at national level. All India data, however, does not justify this extrapolation. It shows that women's share in All India employment in powerlooms is a base 5.22 per cent and not 33 per cent.

Five States, viz. Tamilnadu which includes Coimbatore, Maharashtra, Gujarat, U.P. and Andhra Pradesh, together account for nearly 90 per cent of the cotton powerlooms in the country. The total number of persons employed in powerlooms in these States in 1971 was 1,38,202 of whom only 5.22 were women. Between 1961 and 1971, while employment in powerlooms doubled, the number of workers declined by more than 50 per cent (from 15,340 to 7,222). As percentage of the total employed, women's share declined during the decade from 21.54 per cent to 5.22 per cent Women lost both absolutely and proportionally. (L.C.Jain,1983).

The scrutiny also revealed that not only did the powerlooms absorb less than one sixth of the number of women. Baud estimated, but even this small number was employed at the cost of displacing a much longer number of women workers in the handlooms. The "social autonomy" that Baud saw in the encouraging picture at Coimbatore was enjoyed by only an insignificant number of women compared to the consequential distress of their many sisters. (L.C.Jain, 1984, p.10).

The above conclusions can also be corroborated by two studies regarding employment of women in the handloom industry in the state of Gujarat.

It is estimated that at the time of independence, there were 36,000 active handlooms in Gujarat State. The

estimate of active looms today, varies anywhere from 10,000 to 15,000. Looking to the national scene, this is quite perplexing. Gujarat has population of 7 lakhs members of traditional weavers community. If we take an average family size of 6 persons, there should be at least 1.10 lakhs weaver's households. (Ramesh, R.Bhatt, 1983, pp 1-2)

I. Women handloom workers in the Mahesana District Gujarat -

A survey of 1,010 weaving households conducted in 125 villages of Mahesana district, Gujarat, between November 1981 and September 1982 by the Foundation for Public Interest (FPI), has come up with some interesting findings regarding women weavers.

Approximately, 950 women out of a total of 1,953 women surveyed have reported to know more than one skill related to pre-weaving process. Though, through their activity they support the loom, they are not separately or independently paid for their work. Surprisingly, in calculating weaving cost, their contribution in terms of labour-hours spent, is not taken into consideration. Their work is considered to be free labour and is not paid for. 110 women are occupied in handloom weaving as major occupation and 604 as subsidiary occupation.

It is found that whenever one loom is active and a male-member of the household is working on it, 1.5 additional persons are required to keep it going. They are mostly women and children of the household. Thus every active handloom is always backed up by a woman-worker.

In Gujarat State two important steps are being taken for the development of the handloom industry, they are necessary steps and should be pushed through vigorously.

- a) Improved looms, equipments and techniques are being introduced in handloom sector, and
- b) To produce cloth of standard quality, the weavers are being provided ready-made beams. This not only ensures standard quality of cloth, but also increased production and the earnings of the weavers.

Impact of mechanisation on the women workers

It is seen that providing of ready-made beams will adversely affect thousands of women who are engaged in pre-weaving process. It will destroy whatever skills they possess at present. They will be delinked from the handloom industry or are likely to be pushed out of the industry. Their potential for earning supplementary income or full-time work will be annihilated. When handloom industry is fast expanding and is becoming more paying, the women-folk of the weaver's households should not be deprived of the gains and benefits of development. In fact, they should be made equal partners of development. (Ramesh R. Bhatta, 1983, pp. 1,10-13).

Thus, it is seen that the introduction of mechanisation in the handloom industry has an adversa impact on the women workers because women are not accepted as equal partners of the progress and gains of development of handloom industry.

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II. Women workers in Handloom Industry in Cambay (Gujarat) -

Cambay being an ancient, prosperous port, is not agricultural but mainly engaged in trading of handicrafts. Therefore, the weavers are not seasonal weavers. The weavers are Muslims and Patels, mainly women. Cambay has always been an important centre of handloom, it is said.

The handloom industry has been facing crisis since last two decades. The industry has been reduced to hardly 400 looms today, from 1700 looms in 1950. A large number of 'powerloom' factories cropped up in Cambay which has directly hit the handloom industry. The handloom weavers shifted to the factories creating shortage in handloom, and also production of powerloom being cheaper and of many more varieties hit the handloom market. Even the powerloom now facing closure and recession is declining from 800 to 170 factories today.

Participation of women -

Women in our society play important role in traditional activities. It is said, in Gujarat, it is usually men who weave, and women and children do the pre-weaving work. However, in Cambay, women who are the weavers, actively operating pitfly shuttle looms, and producing sarees and turbans.

Majority of them are Muslim, observing 'purdah' not used to work outside the home. Therefore, for them, handloom is an important source of income. 35 per cent of women are doing the work single-handedly. In a few cases men help too. So long as there is work on hand they enjoyed no holidays, even Id or Diwali. Whenever there is

sickness in the family, she cannot do the work. Due to constant activity of their limbs, the women complain of pain in the legs and arms. A few also complain of chest pain.

Impact of mechanisation of the women workers -

It is a sad state of affairs that the Handloom Industry faced crisis against power looms that too are closing now one by one. A textile mill in Cambay is also closed for a long time. Hence unemployment looms over Cambay. Some of the men have been able to find work in Agate Industry or diamondal polishing or some other work. But women being handicapped, are restricted to only home. It is often observed that in the course of economic development, many of the home industries are superseded by mass producing factories. The traditional economic activities like home-crafts are usually done by women, hence it is the women who receive the brunt of unemployment. They are deprived of many opportunities to earn money incomes and to contribute in kind to support the family. No alternative employment reaches them. Ultimately, women are thrown out of the development process of the nation. In this way, these experienced and skilled labour force is lost to the national development. (Ela R. Bhatt, 1977, pp.1-5).

The observations made on Handloom weavers of Mahesana District and Cambay are applicable to almost all the handloom weavers, residing in most of the districts of Gujarat State. The mechanised sector multiplied drawing in substantial investment resources, while cotton handloom industry has squeezed and shrunk causing distress to large number of women workers.

b. HANDBLOCK PRINTING

Traditionally handblock printing is a cottage industry. The printer and his family formed the basic production unit. The family would own a small low table which was placed in a room, and worked sitting on the floor next to it. The colours were mixed and prepared outside the cottage or in the courtyard. It was and is a hereditary occupation and all members of the family would contribute to the printing work and its ancillary operations. (L.C.Jain and Kapadia, 1984m, p.469)

Mechanisation in the Handblock Industry

A review of the handblock printing industry in the post-independence period shows that a chronic mismatch between policy and implementation has frustrated the attainment of the triple objectives of employment, exports and equity. Every intervention planned by Government to provide relief to the hand-printers by restricting mill printing has been resolutely frustrated by the implementation machinery. (Ibid, p.459)

As far back as in 1958, the Research Advisory Panel on Textile Printing Industry had cautioned against a policy of "technological laissez-faire" in a country with "a vast and rapidly increasing population and chronic mass unemployment". The panel noted with concern the rate at which workers in handblock-printing were being displaced by mill-printing. In Ahmedabad alone, between 1953 and 1957, the number of hand-printers had been reduced by seventy per cent from 8,000 to 2,500; about one half of the workers being women. For example, in Lucknow only 15 per cent of the 1,000 printers who

were known to be active as at the end of the second World War, were found engaged in printing in the early 60s. In Gwalior, the output of hand-printed textiles had declined steeply from Rs.8 lakhs in 1950 to Rs.1.5 lakhs in 1964 - a fall of 80 per cent. The 1961 census could find only 49,181 printers in the country as against an estimated 200,000 at the end of the Second World War reported by the Panel. Recent estimates confirm that labour per unit of output in hand-printing is 15 times that in mechanised printing. (Jain and Kapadia, 1984, P.459).

There has been growth of mechanised printing of cloth costing the economy substantial investment. There is further investment in the manufacturing of textile printing machines (L.C.Jain,1984,P.11). A major consequence of these developments in the past 25 years is that an estimated 250,000 job opportunities have been lost to the economy. Instead machine have been employed to print 942 million metres of cloth (mills 662 and processors 280 million metres) over and above the 500 million metres at which their output should have been frozen as recommended by the panel. The comparative employment per unit of output between hand-printing and mill printing is 15:1.

Between 1975 and 1979, in a period of just four years, the numbers of printing machines in the composite mills increased from 421 to 650, i.e., by more than 50 per cent.

The 'bogery of exports' has often been used for expansion of mechanised printing. Comparative figures of exports of mill-printed fabrics prior to 1966 when mills were subject to

ceiling restrictions and in the period thereafter show little improvement. (D.Jain, 1984 , p.8). 94 per cent of the mill printed textiles are unloaded in the domestic market squeezing the hand printers out of existence. An estimated quarter of a million job opportunities have already been lost to the hand block printers and the process continues unabated. The proportion of women among the printers would be between 25 to 30 per cent. ( LJC.Jain,1984, P.11)

Impact of Mechanisation on the women workers

There is a steady displacement of workers in the hand block printing industry and the benefits of expanding demands for printed textiles are going to machines instead of over idle manpower. (D.Jain,1984 , P.8)

While the actual proportion of women workers in hand printing is not available, a survey done by SEWA (Ahmedabad) of the Handblock printers in Ahmedabad brings out that a number of women are engaged in this industry and that they are feeling the brunt of displacement.

What horrors displacement means to the affected individual printers is best conveyed in their own voices:

"In my father's time there were 18 printing tables in our house. Today there is only one ....."

"very bad times have come, the whole business of hand-printing is dying, will die very soon. Within ten years it will be no more. These blocks will be used as fire wood....."

"Even if I get a job in screen printing, I cannot go. A youthful widow is not permitted to go to factories."

(Voices of women Hand-printers of Ahmedabad, recorded in the study "Chippa women" by Ela R.Bhatt,1980)

The IDS survey of hand-printing units in Farrukhabad

in 1980 showed that with an increase in income above a certain level, the women drop out of the printing work.

Also they do not participate of the printing is done outside the house. with higher incomes the men also confine themselves to the functions of management and supervision.

It is seen that mechanisation has an adverse impact on the women workers. It has resulted in their displacement as well as drop out of the printing work.

The pattern of technological growth in the textile printing industry is clearly contrary to the employment policy of the plan, which is to maximise labour absorption and minimise capital per unit of output and per person employed. Hand printing not only satisfies this criteria, it is also low in energy consumption. Notwithstanding these advantages substantial investment has been allowed to be made in machine printing and indigenous manufactured of printing machines.

C. WOOLLEN COTTAGE INDUSTRY

The Woollen Cottage Industry is principally located in hill and desert areas - the backward areas which have few non-farm employment opportunities other than handloom woollen weaving. Even agricultural activity in these regions is limited due to severity of climate. (L.C. Jain, 1984, p.12).

According to latest field surveys in six States (Jammu and Kashmir, Himachal Pradesh, Punjab, Haryana, U.P., Rajasthan) an estimated 1,67,000 persons are employed in spinning and weaving in the woollen cottage sector. Assuming these six States to represent two-thirds of the total employed in the woollen cottage sector, employment at All-India level in this sector of the woollen industry would be an impressive 2,50,000. (Surveys of Woollen Handloom Industry, 1982).

The households are mainly self-employed and belong to the poverty groups, within them mostly scheduled castes and scheduled tribes. (L.C.Jain, 1983, p.427). Spinning accounts for 90 per cent and weaving 10 per cent of the workers. Spinning is done mostly by women, and weaving by men. The employment is seasonal fits very helpfully into the slack agricultural period. (L.C.Jain, 1984, p.12)

Consequences of the mechanisation on the workers -

The modern woollen spinning mills which will expand under the new textile industry policy will without doubt rapidly mop up whatever little raw material now sustains the

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cottage sector, pulling the carpet from under its feet. The prices of residual wool in the hands of the poor producers in the cottage sector will bear such a high price that it will make their local products lose in competition with the mills. When imported shoddy will be used as the raw material, the final products will offer even more unequal and unfair competition to the traditional woollen cottage sector. (L.C.Jain,1983, p.428).

Already there is evidence that the emergence of the modern sector in the woollen industry, as for example, in Amritsar has had an adverse impact on the woollen handloom industry in the rural areas of that district. A December 1981 Survey found that " rural locations like Jandiala, Majitha and Ajnala were reported to have had woollen handloom activity in the sixties, but do not have any activity at present." The survey also reported that "some parts of Gurdaspur District were known to produce bukram with cloth in the sixties. This was mainly done by household weavers. The activity has now dwindled to an insignificant level as the individual weavers were unable to keep up with the rising price of woollen yarn". (Survey of Woollen Handloom Industry, 1982).

In effect, delicensing of the woollen industry means that contrary to the premises of the Technology Policy, woollen goods will no longer be produced by the weaker sections in the hill region; they will no longer

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be produced by the masses but will be mass produced by the machines employing a fraction of the numbers who will be displaced. The worst to suffer will be women in the hill and desert regions who are unable to migrate to cities unlike some of their men folk. (L.C.Jain,1984,p.14).

Impact of mechanisation on the women workers -

The modernisation of the traditional woollen handloom weaving industry is adversely affecting the employment and income of the traditional artisans, especially women.

In 1977-78, a case study was conducted by the Institute of Social Science (ISS), on the 'Modernisation of the Traditional Handloom Weaving Industry in Jammu and Kashmir.'

The Traditional Industry -

The woollen handloom industry in the Kashmir Valley is an ancient craft. The skill in weaving is handed down from one generation to the next. The handwoven woollen fabrics have a local market because of the severe winter. The industry becomes their most important 'supplementary' source of income'.

The main constituents of the industry are the hand spinning of the woollen yarn, the hand preparation of warp and weft and the hand weaving of fabrics. Yarn making is the first step in the process of woollen fabric production. In the Kashmir Valley an estimated 16,000 rural women are engaged as hand-spinners. They earn an average of Re.1/- a day for about four to five months a year. They work about four to five ~~hours~~ a day.

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It is estimated that a further 10,955 persons are engaged in the pre-weaving and waving operations. Allied workers are generally members of the weavers households and are most often women. (The Integrated Development Project for the Woollen Handloom Weaving Industry in J&K, 1978, p.1)

Modernisation of the Traditional Industry -

In 1975 the Government decided to modernise the Kashmir woollen handloom industry. One of the important objectives of this modernisation was to equip the industry to produce hand woven woollen fabrics for the export market. (Ibid, p.2)

The modernisation project can be broadly divided into three components :

- 1) the replacement of hand spun yarn with mill made yarn; replacement of existing looms including fly shuttle looms with more modern looms fitted with 'take up and let off' motion; and, the replacement of the manual preparation of warp and weft by a central mechanised unit to prepare and supply ready-made warps and wefts.
- ii) Installation of modern plant and equipment for all pre-loom and post-loom processing, including scouring, dyeing and finishing;
- iii) Training and marketing support.

Size of Loom - The new loom is very solid and its standard size - 6' (length) x 8' (width) x 6½' (height), whereas the size of traditional loom varied : 8' x, 6'x6' and 4½'x4½'.

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Impact of modernisation on the women workers -

The study shows that there has been a sharp reduction - ranging from 40 to 80 per cent - in the employment of allied workers, mainly women belonging to the weaver households, and that all the weavers have suffered a fall in their monthly income since they joined the Project. In three cases, the decline in income ranged from 60 to 80 per cent.

The following conclusions can be drawn -

- i) As only mill-made yarn is to be used, the expansion of the project will make the 16,000 women handspINNERS its first victims. They are bound to lose their traditional occupation and income. If the project installs all the 1,000 looms as presently planned an overwhelming majority of the women hand spinners will have their employment taken from them.
- ii) Another large groups of women workers, estimated between 2,000 and 3,000, whose employment is sure to be redundant are those who prepare the warp and the weft. Together with these men who undertake this part of the process, the women will be fully unemployed as soon as the Project has completed the installation of its mechanised equipment for the preparation of the warp and the weft.
- iii) The Project's ability to increase the financial gain of the weavers is itself in doubt. The weavers are receiving a lower cash income than they did before they joined the Project. This is despite the fact that they

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now have high productivity modern looms that have been installed at substantial capital cost and public subsidy.

iv) The traditional marketing channels also face disruption at the hands of the Project. The exclusivity arrangement which prevents a weaver from producing for anyone else, has deprived these channels of any supplies from the Project looms.

v) This reduction in supply of the traditional marketing channels will adversely affect local consumption patterns, especially considering that supplies are already short of demand.

Thus the basic character of the traditional weaving industry in the Kashmir Valley will suffer. From an industry based on local raw materials, satisfying local demand and providing essential employment to thousands of rural households, and women in particular, it will become an industry based on imported materials, producing goods for an export market, utilising only a percentage of the previously active labour force. (The Integrated Development Project for the Woollen Handloom Weaving Industry in J&K, 1978, pp. 1-11)

ANALYSIS

India's constraints in creating new and additional jobs are many and can be appreciated. Should we then destroy lakhs of jobs the poor have traditionally created for themselves on their own and with all their meagre resources, without providing an alternative? 'At what cost employment' is a question often heard. It is, therefore, essential to ask also 'At what cost and at whose cost unemployment'.

What we are witnessing is unadulterated technological laissez-faire. Is this a sensible, humane policy for a country with vast and rapidly rising population and chronic mass unemployment? It is noteworthy that "thoughtless mechanisation" continues unabated even after the Sivaraman Committee warning to the Planning Commission in the handloom case, that "technological laissez-faire" is not consistent with plan objectives and must be stopped.

F FISHING INDUSTRY

The introduction of mechanisation brought with it several important changes in the fishing trade. Mechanised boats and improved gear were introduced to modernise fishing and the use of ice and freezing were introduced to improve the preservation of the fish caught. It is essential to examine how the resulting changes in the technology of fishing and fish preservation have affected women of fishing households.

Ester Boserup was aimed at the unthinking assumptions of planners and neo-classical economists who either practised a form of 'sexist myopia' when it came to the work women were actually performing inside and outside the household, or else comfortably waited for the benefits of economic groups to "trickle down" to the less privileged group. (Boserup, 1970). As Kerala economist, John Kurien aptly puts it, there has been a long standing and top sided commitment on the part of state and aid agencies to the development of "fisheries" rather than of the fisherfolk themselves. (Kurien and Mathew, 1982).

Leela Gulati in her study observed that the the "Indo-Norwegian Project"<sup>1</sup> for enhancing fishing

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1. It was set up under the aegis of the United Nations in Kerala. Its objective was to increase in the income of the fishermen, to improve the fish products; to improve the health and sanitary conditions and standard of living of the fishing community. The project envisaged the following : mechanisation of existing crafts, Introduction of suitable new mechanised boats; introduction of ice and improved freezing techniques for the preservation of fish, use of insulated vans in fish disposal.

technology, as it was conceived and designed, was mainly geared towards men in the community. Since women did not go out for fishing, it was assumed that change in the technology of fishing ( i.e. "Purse-seniers") was of no direct concern to women. However, women did participate to some extent in the preservation, distribution and marketing of the fish caught under traditional methods. But the Project did not show concern for women as such in the measures envisaged for the improvement of fish preservation, distributed and marketing. The only change to be directed explicitly towards women was the introduction of better sanitation and medical health facilities.

The basis underlying assumption of the Project was that of men of the fishing households could be helped to improve their economic position, their women-folk would automatically stand to gain. Very often this assumption is justified on the grounds that either women in these households are not doing anything economically productive work, or even if they are involved in economic productive work, it is not of much consequence or concern. These assumptions, to say the least, are quite arguable (Gulati, 1984, p.1).

Questions such as the following have seldom been raised : how do women adjust to major technological changes in the work of their menfolk, or what measures should be taken to draw women into the new situation created by technological changes. Therefore, it is necessary to examine -

a) As a result of changes that have occurred in

the technology of fishing, what change has occurred in the work status of women.

- b). As a result of changes in women's work participation, has there been any change in the status and roles of women?

Changes in the work status of fisher women -

Mechanisation has been introduced not only into male work but female work as well. Women themselves have such a low estimation of their work and its return, that they themselves are least concerned about their involvement ( or the lack of it) in work, present or prospective. Yet when circumstances so change as to deprive women of what little work they are able to do, it can adversely affect certain households. Actually the decline in figures of women's work participation in India since the turn of the century clearly shows that technological advance has tended to takenaway from women. (Gulati, 1984, p.1). The following examples will clearly illustrate this point :

a) Introduction of net-making machines -

Kalpana Ram, in her study on 'the coastal fisher women of Kanyakumari' noticed that net making, one of the traditional jobs allocated to women, is a classic instance of a form of work which is not only performed in the home but fits into all the nocks and crevices left unfilled by house work. Whatever other

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work these women do has to be such work as can be performed in or from the home itself.

I) In 1978, 5 net making machines were brought by a private muslim trader in the Kadalkarai village, thus severely threatening a meagrely paid but prized source of income for women. As the traditional weavers of fishing nets, women work within the home but on the basis of taking orders from other households as well. The current rate is about Rs.50-70 per kg. of net depending on the type of net, and an individual could earn between Rs.40-50 per month such work tends to be performed within the interstices of house work. As a result it is performed more intensively by young unmarried girls. Since the introduction of the machines, a contradiction has merged between the immediate interests of the men and those of the women. The men prefer the speed and promptness of delivery offered by the machines - a factor of some importance given the sudden appearance and disappearance of shoals of fish - while the women have felt threatened enough by the loss of income to have partied in six months of picketing, fasting and rallies in the main district town of Nagercoil towards the end of 1978.

ii) Increase in occupational Health Hazard - The change from cotton to nylon nets by the men has increased the 'occupational health hazard for women. The women complained of "increased heat within the body" as a result of working with nylon.

Netmaking and making thread out of cotton account for another 11 per cent households in the Kadalkarai

Village. Here the impact of the netmaking machines and the consequent fall in the number of orders placed must be taken into account in assessing the importance of these forms of work for women. (K.Ram,1984,pp. 6-11).

b) Impact of modern method of transportation -

The exclusion from basic technology is evident in women's lack of control over even elementary forms of transportation. (Kishwar and Vanita, 1984, p.20). Most women are now left to find new ways of livelihood in replacement of their previous occupations as fish traders. Male merchants have entered the scene to transport the catch faster in lorries or on bicycles. (Brandtzaeg,1979, p.1922).

A study of fisher women in Kerala showed how women are increasingly losing their small business to men. Traditionally, fish vending was predominantly a woman's occupation. She would carry basket-loads of fish on her head to nearby villages, door to door. When it came to supplying the more remunerative city and export markets, however, men took over the whole business. In a much shorter time men can carry much larger quantities of fish on trucks and other motorized transport which women can never hope to use. Even for door to door vending, while women go on feet, and, so that the fish does not get stale in the heat, have literally to run for miles instead of walking, men are able to outstrip them because they carry fish on bicycles. Thus even while

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women vendors are compelled to work much harder, they get 'lower' returns for their labour. (Kishwar and Vanita, 1984, p.20).

Also, the short-distance head-load or bicycle-load marketing of fish in the interior village is being replaced by long-distance fast-moving trucks routes to make fresh fish available in the large metropolitan markets in the cities of Bombay or Madras. (Shiva and Bandyopadhyay, 1982, p.1831). Here once again, women have no access to driving these vehicles.

c) Growth of Freezing plants -

In Quilon District in Kerala, an Integrated Fisheries Development Project was started 25 years ago, sponsored by the Norwegian Agency for development. While the intention was to improve the conditions for the poorer families and increase the local consumption and distribution of fish, the main activities today are trawling of prawns and freezing of the catch for export. The Project as such, completely ignored women in practically every aspect that it stood to occur. (Brandtzaeg, 1979, p.1922).

The traditional preservation processes of drying, salting and pickling, mainly undertaken by the women-folk of the traditional fishing community in a labour-intensive manner was replaced by modern technologies of

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deep-freezing, steaming or canning, undertaken in the centralised factories, that have come up in the fish landing centres. (Shiva and Bandopadhyaya, op.cit. p.1831; Brandtzaeg, 1979 , p.1922).

d) Growth of Processing Units -

The traditional fishing and fish trade is increasingly replaced by modern methods of fishing, processing and marketing. (Brandtzaeg, op.cit. p.1922). The processed fish are exported mostly to foreign countries, 80 per cent of which is exported to Japan. (Randive, 1984, p.11). Factories have come up for processing and freezing of fish and prawns. Some women get employment as casual labourers in the new factories, but at lower wages than men. women are left out of the mangement of the new technology in the factories. (Brandtzaeg, op.cit. p.1922).

Examining 'the conditions of employment of Kerala women in the fish-processing units of Gujarat', Suchitra Anant of the ISST Research team, found that the young unmarried girls, more than 4,000 aged 21 years and above are working in Veraval in Gujarat. There are about 14-15 companies at Veraval, <sup>for</sup> processing the fish.

The processing Techniques and women's tasks -

The fish and prawns to be processed are brought from various landing centres to the plant in trucks and the following processes take place by different groups of workers :

a) Unloading of fish and keeping it in ice till

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cleaned, is done by Gujarati women.

b) Cleaning of prawns (peeling) is done by both Gujarati as well as Kerala women workers. Introduction of Gujarati women for peeling prawns is a very recent phenomenon.

c) After the fish and prawns have been cleaned they are graded and packed by Kerala women.

d) The packed boxes are immediately kept in freezers by the Kerala men.

The Kerala women workers both peelers and graders, are employed only for 9 months in a year.

#### Recruitment of labour -

Labour is always recruited through contractors who are usually men from the same village. The contractors bear an overall responsibility of production, supervision and wage distribution.

#### Wages -

The minimum wage for peelers in fish processing industry in Kerala works out to be annual Rs.17/- (The basic wage of Rs.7.40 + D.A. which is calculated on the basis of the CPI for particular district). But in actual practice they get Rs.8/- only. It is estimated, the peeler makes about Rs.160/- p.m. The payment is made on the basis of number of basins peeled. Each basin contains approximately 5 kgs. of shrimps. The grader also does packing and gets fixed salary Rs.300/- to Rs.325/-.

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Working Hours -

The working hours are usually very long from 8 to 9 a.m. to 12 midnight during season. Otherwise it is till 6 p.m. in the evening. It depends on the catch. There were no fixed hours of work, neither they were paid for working overtime and till late in the night.

Labour legislations -

According to the Minimum Wages Act, the women workers are entitled to get Rs.10/- for semi-skilled work. But as per the report, it was found the Minimum Wage Act was violated in case of peelers.

The Interstate Migrant Workers Act was also found to be violated. The Act states the wages are to be paid by the contractors in the presence of the company and women are to be paid wages since the day they leave their homes for Veraval. But the Act is blatantly violated by the mangement leaving the field open for profit to the contractors.

Accommodation -

The women workers are accommodated in small, damp and stink rooms, the number varying from 9 to 15 each room. The quarters are in the vicinity of the factory.

The food is mostly cooked by girls themselves. It is usuællly gruel-rice and some vegetable. Tea and coffee is made occasionally, the mass fee is deducted from the salary which ranges from Rs.90-125.

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Health Hazards -

Women are provided with aprons and caps. But the need of wearing gloves is very important. Women are to work in the ice, stand hours together there when the fingers become numb.

Right to form Trade Unions -

The employees have no right to form trade unions and have no means for redressal of their grievances. The hours of work is extended sometimes upto 12 hours per day.

The study reports, one Mr. Nair who has visited the place made a petition to Kerala Minister on behalf of 3000 women and men workers, stating the workers were denied benefits entitled under various labour laws and they were subjected to exploitation of various kinds. The workers actually were made bonded labourers and wages were not paid properly by the contractors, over-time is not paid. There is no security of jobs.

The ISST REPORT concluded with the following :

To conclude, the high rate of unemployment coupled with poverty and big family size force women workers from Kerala to take up jobs outside Kerala. The newspapers which have made scope into the working conditions of these women have also alleged sexual harassment by the supervisors and employers. The girls/women were too frightened ( or threatened ) to admit harassment of any sort during the interviews. To what extent this kind of harassment is going on is yet to be ascertained.

This was because the Kerala women came from families of abject poverty, were relatively young and unmarried, and were not unionised. (Madras Institute of Development Studies, 1984, p.7)

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The new fish processing units provides a way for exploitation of women workers as economically, physically and mentally.

Within these strongly cohesive, mono-caste fishing communities, women have an important position. Indeed, one could even characterise the situation as typifying an inversion of the equation, feminists such as Simone de Beauvoir have described between "woman" and "nature". (Beauvoir, 1957). Here, it is the men who are totally bound up in the rhythms of nature - the tides, the sea, the stars and the movement of fish govern their lives. Even when the men are on land, they are caught up in basic routines of physical renewal - eating, sleeping, drinking, gambling, having sex. It is the women who consistute "social" or "culture", in the sense of community life, cultural and social reproduction, religion and ties with inland communities through trading networks.

The main productive activity and main source of income, i.e. fishing, is an exclusively male occupation. This means that for all the sentiments regarding the importance of daughters, the accumulation of male labour power in a household is of considerable economic importance in maximizing income, and further, in acting as a basis for influence in the village. Female economic activity is far less remunerative, and therefore does not generate economic independence or permit access to the means of production. (K. Ram, 1984, pp. 9-10).

The above position can be illustrated by Karuna Anbarasan's case studies of three fishing villages in the

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Chingleput district of Tamil Nadu regarding the role and status of fisher women in these villages.

It was found that while the fisher women were income earners and shared with men the activities of fish distribution and marketing, fish processing, curing, preserving and other allied tasks, they had in general a low status and were eliminated from the decision-making process, especially in matters concerning the whole village. She found that the prevailing economy and technology, asset ownership pattern, socio-cultural and traditional values of the fisherfolk, and political and social awareness contributed to the low status of the fisherwomen as a group.

Increasing urbanisation and the growth of market has affected women negatively on two counts.

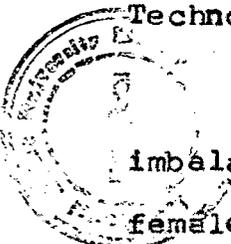
1) The introduction of nylon nets fabricated by machines and which facilitates larger catch, has denied the fisher women the task of net-making which they had been involved in hitherto. (This observation has also been made by Kalpana Ram in her study on the coastal fisherwomen of Kanyakumari)

ii) Also the introduction of auction system of marketing has forced women to compete with large traders, causing them to lose out of their traditional activity of fish marketing.

She also noted that the socio-cultural values and norms all served to reinforce the view that women cannot

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claim control and manage production assets, and that women should discuss matters only related to their family, and not those related to the village. (Women, Technology and Forms of Production, 1984, pp.6-7).



Kalpana Ram in her study argued that the imbalance in the remuneration available for male and female work further strengthens ideologies of male primary and sexual control of women. Thus one finds that women's work-roles are governed not only by what is "objectively" available, but also by notions of what is "proper" for unmarried girls and young married women where particularly control of women's bodies and sexuality are of special importance. Thus one finds an over representation of certain categories of women in public forms of work such as vending. (K.Ram,1984,p.11)

Modern technologies of fishing and fish preservation were introduced in order to increase productivity in fishing and fish preservation, which will bring about an increase in the income of the fishermen and to raise the standard of living of the community. The 'Purse Seine fishing' has assured the fish merchants a large quantity of fish for selling at considerable profit in the interior markets. It is well known that purse-seiners make considerable profit during the short period of a single fishing season or just one year. (Korakandy, 1984, p.568). Therefore, it is necessary to examine the impact of 'increased prosperity' on the status of fisherwomen.

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Brandtzaeg states that in the fishing communities, a rise in the family income does not necessarily result in improved nutritional levels, though transistors, bicycles and wrist-watches find their way into the household. (Brandtzaeg, op.cit.)

Kalpna Ram in her study about coastal fisherwomen of Kanyakumari observed that technological changes resulted in increased prosperity which in turn led to increase in dowry practice. Traditionally, dowry has been given, but between status equals, not in the hypergamous tradition of seeking a higher status bridegroom. Today, this is changing with the entry of boat ownership into the fishing community - the rate of dowries has escalated beyond all proportion. A wage worker on a mechanised boat can ask for Rs.40,000, while a boat owner can demand Rs.60-70,000 as dowry. (K.Ram, 1984, pp.9-10).

Similar observation has also been made by Leela Gulati in her study about 'fisherwomen on the Kerala Coast'. She observed that their recent prosperity in the wake of mechanisation of fishing and the discovery of prawns in large quantities has resulted into increase in dowry demands among these communities. (Gulati, 1984).

#### Spread of dowry -

Though dowry is not an entirely new concept in the fishing villages, it did not prevail in the way it does today. By the late 1960s, dowry had escalated considerably. It is noteworthy, however, that it is

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among the Latin Catholic fishing households that the escalation in dowry has been significant.

Dowry usually is given in cash, land and gold in the form of ornaments. Cash is usually handed over during the engagement ceremony to the groom's parents. Gold takes the form of jewellery, the gold content and purity being discreetly checked, and any discrepancy resulting in the rejection of the girl.

The husband has used the dowry to buy a craft or boat, build a house or buy a passage to the Gulf. Usually, the boy's parents want to make use of it either to marry off daughters or to clear past debts. (Gulati, 1984).

Due to the process of socialisation, lack of education, training and skills, women themselves have such a low estimation of their work and its return that they themselves are least concerned about their involvement in work. Yet when circumstances change and to deprive women of what little work they are able to do, it can adversely affect certain households. The technological advance has tended to take work away from women. The prevailing economy and technology, asset ownership pattern, socio-cultural and traditional values of the fisherfolk and political and social awareness contributed to the low status of the fisher women as a group.

II

ORGANISED SECTOR

The organised sector in the Indian economy comprises of - a) all public sector establishment, i.e. all services under the central, state and local Governments and occupations in public undertakings in the field of industry, credit financing, public utilities, etc.

b) non-agricultural private sector establishments which employ 10 or more persons.

Out of 46 million total female main workers, 2.76 million women are in the organised sector. And this is the sector where 'the new technology' has been introduced in an intensive and extensive manner.

a) TEXTILES INDUSTRY

The textile mills, which is also the organised sector, are prospering and dominating India's economic and social life since they provide direct and indirect employment to millions of workers. The opportunities for employment of women in the organised sector has been constantly decreasing. Industrialisation in India began around the middle of the last century and by the first decade of this century 'cotton textiles' emerged as the dominating non-agricultural industry. From the beginning women played an important role in building up the industry and by the 1920s women constituted 20 per cent of the work force in cotton textiles. (Toward Equality, 1974). The 1930s saw a turn in the attitude of this big national industry towards its women workers. While the industry was still struggling to grow, it welcomed women workers and used their labour to the fullest. However, once it became a settled industry with a powerful hold in the economy, it no longer wanted women workers and began to expel them till in the 1970s the percentage of women workers was reduced to 2.5 per cent in cotton textiles. (Ibid,p.191).

Women workers in the Cotton Textile Industry \*

In the oldest industry of India - textile industry women have been the main targets of rationalisation and

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automation. (Patel, 1984, p.5). Experiences of Bombay, Kanpur, Delhi, Ahmedabad and Calcutta have shown that in the pre-independence days women workers constituted nearly 20 to 40 per cent of the textile industry, now they are merely 4 per cent to 5 per cent of the total textile work-force. (Jhabwala, 1985 ; Report on the women workers of the Cotton Textile Mills in West Bengal, 1984). The Textile Industry is the one where the women employment has actually decreased to almost half from about 102 thousand to about 59 thousand over 1950-70. (Acharya, 1982, p.9)

The following table will show the sex-wise distribution of workers in the Textile Industry.

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TABLE V

INDICES OF SEX-WISE DISTRIBUTION OF EMPLOYMENT IN INDUSTRIES  
( COVERED BY THE FACTORIES ACT, 1948 ).

	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960
TE	100	102.44	102.09	100.03	100.70	102.27	111.22	113.02	107.63	107.93	110.57
WE	100	98.54	93.28	86.94	84.80	81.88	77.88	79.43	69.40	68.23	67.55
	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	
TE	118.14	115.36	118.44	123.33	120.76	115.82	118.45	112.33	108.50	111.45	
WE	66.28	65.99	65.60	63.36	61.15	57.12	55.56	53.03	50.10	57.70	

Source : Sarthi Acharya, 1982, Transfer of Technology and women Employment in  
India

TE = Total Employment

WE = Women Employment

From the table it is seen that the women employment has actually decreased to almost half from 1950 to 1970 in the textile industry.

#### Technical Production Process in the Textile Industry

The technical production process is divided into the following functions :

In the mills, production is divided into three main departments - preparatory, spinning and finishing. The preparatory work is divided into breaking up of the bales of cotton (mixing), removing foreign particles (blowing), loosely reaping the cotton (carding), which prepares it for the stretching into yarn in two stages (spinning). Afterwards, the yarn is wound into cone yarn ( cone winding), or into small bundles of hank yarn (reeling). This completes the process in the spinning mills, in composite mills the process continues by weaving the cloth. (Baud, 1984, p.34).

#### Technological change in the Textile Industry -

Technological change is one of the reason cited for decline in women employment. The Report of the Committee on the status of women in India cites it as the single most important factor. The report adds, "The initial adverse impact of more sophisticated technology in industry on the employment of women has been a global trend". (Report of the Committee on the status of women in India, 1974, p.199). Generally as the industry modernizes, it produces new technology needing a higher level of skills and pays correspondingly higher wages. At this stage women, who are considered fit only

for manual work, are displaced and the decline begins. (Jhabvala, 1985, p.9).

Technology is made out to be a demon god whose hunger is satisfied only by the sacrifice of women workers. or is it that industry's choice of capital intensive technology, inevitably results in rationalisation? And our unions and progressive forces, unable to fight the growing monster of unemployment, save their own skins by throwing out the women workers as its first victims?

#### Major changes in the Textile Industry

The nineteen twenties saw a flooding of the Indian market by the Japanese Textile Mills, offering effective competition to the Indian Textile Industry. The Indian Textile Industry felt that Japan was able to compete so successfully because they had been able to instal more modern machinery in their textile mills.

The Indian mill owners decided that in order to be able to compete effectively they too would have to introduce more modern machinery. The cheese winding machines were introduced in the early 1920s, changing the winding process from one requiring more hand labour to one using machines. Within ten years, these machines too were rendered obsolete by the universal winding machines. These machines compressed the winding and reeling processes into one, winding the yarn straight on to the beam, so that reeling into banks became unnecessary. The spinning department underwent technological changes at the same time. Single-sided spinning machines were replaced by the

double-sided ones, requiring fewer spinners and doffers per thousand spindles. During the 1950s, mill owners began pressing for introduction of yet another technological innovation - replacing the two-sided spinning machine by the four-sided ones. (Ibid, pp.33,39,54).

Some major Technological changes in the Textile Industry since 1950 -

<u>Technology</u>	<u>Description and Impact</u>
1. Direct Card Feeding	Eliminated picking process and associated labour power.
2. Open-end spinning	Integrated roving, spinning and winding producing two or more times the output of conventional spindles.
3. Shuttleless looms	Operate at fast speeds and require fewer auxillary operations than shuttle looms. can produce about 50 per cent more cloth than the average shuttle loom per hour.
4. Electronic Computers	Used by management for sales analysis and forecasting, process inventory and work flow management Rapid growth in use of computer is expected throughout the industry.

(Chapkis and Enloe, 1982, p.20)

These are the major technological changes in the textile industry since 1920s.

Impact of Technological changes on the women workers

The technological changes have led to overall woman power cutbacks. Its impact on the women workers

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can be seen by taking into consideration the following:-

1. Recruitment of women workers -

Isa Baud, in her study on Coimbatore Textile Mills revealed that the absolute number of women workers being recruited is decreasing, at the same time the absolute number of male workers is increasing. In addition, the percentage of women workers in the total labour force is decreasing. In 1955, women workers were 7.4% of the total labour force among workers actually employed. In 1961, this had decreased to 6.0% In 1972, women workers were 4.3% of the total labour force on roll. This downward trend is likely to continue. (Baud, 1984, P.12).

Baud, further noticed that the mill management prefer to recruit a better-educated, young male labour force currently. Therefore, a series of recruitments have been set up by management; some mills will also not accept new women workers, only young men. (Ibid, p.32) .

Since the passage of the 'Maternity Benefit Act' in 1961, management has even more consciously restricted employment of women within the reproductive age group. Out of 300 women covered in a 1980 survey, 204 had reached menopause. Many owners laid down an informal stipulation that only women above 40 should be hired. The again of the female workforce without fresh recruitment was one of the method by which maternity benefit could be avoided. (Chhachhi, 1982, pp.43.44)

The recruitment system in the mill sector has become much more stringent than in the past, which has had an especially negative effect on the possibilities of recruiting women.

2. Retrenchment of women workers -

Women workers loose jobs in the textile industry either as a result of retrenchment at the time of automation or the retired women workers are replaced not by women workers, but by men workers. (Ghosh, 1984). During the 1920s and early 1930s in the textile industry, the total number of workers increased by nearly 50,000 i.e., by over 100 per cent. The increase in the number of women workers is only a thousand ( from 9,649 to 10,649) i.e. only 11 per cent. This means that women who were displaced by rationalisation were more or less absorbed in the growth of the industry, but the growth did not provide new opportunities of employment for women. (Jhabvala, 1985, p.41). For example, the number of women in the textile mills of Ahmedabad has steeply fallen from the once peak of 18 to 20 thousand regular workers in 1918 to the present - day 3000 workers. In 1935, more than 10,000 working women were retrenched particularly in the spinning departments; from all the 65 mills. The work of the retrenched women workers was passed on to the men workers which in fact doubled their work load. After 1935 began

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'rationalisation and modernisation' of the textile industry and retrenchment of working women became a regular practice. As a result, by 1975 there were only about 3,000 working women left in the textile industry at Ahmedabad. (The voice of the working woman, 1983, p.8).

Now, the elimination of women from the industry was achieved through indirect methods. Today, the majority of women textile workers are between the ages of 40 and 55 years old. No fresh recruitment of women is being taking place, and mills are entering into a second phase of rationalisation (Chhachhi, 1982, p.42).

In the textile industry, where a series of occupations manned by women employees have been replaced by automatic machines and these machines are manned by persons of different skills, not necessarily women, and this new employment is not necessarily of the same size as before. (Acharya, 1982, p.4).

Permanent workers could not be so easily got rid of and to avoid too much trouble, good reasons had to be found for their dismissal. The best reason put the blame for dismissal on the women themselves and absolved everybody else of responsibility. What better reason than that women are not capable of running the new machines?

Nathalal, a spinner in New Manekchowk Mill, explained -

"The new spinning machines were much too complicated for women to run. How could they learn it? The bobbins are too heavy for them and the work is too strenuous. .... they cannot do complicated or heavy work."

This argument then builds itself into a vicious circle. Since women are incapable of running the machines, there is no use training them to operate these machines. But when the machines come, women remain untrained and cannot handle the machines. Therefore, they are unneeded, dispensable and should be dismissed.

During the 1950s, the two-sided spinning machines were replaced by the four-sided ones. This led to a further spurt in the decline of women workers, because the TLA group-in-charge explains :

"We sent the men spinners for training in running the four-sider, but there was no use sending the women."

Women workers had also internalised the idea that they were incapable of running the new machine, and in shame quietly accepted their own retrenchment. (Jhabvala, 1985, pp.54-55).

The equations of women/unskilled, men/skilled is often based on presuppositions about male and female capacities and tend to reinforce sex segregation. (Chhachhi, 1982, p.42).

Women workers in Ahmedabad mills :-

"Women can do any kind of work but they do not take women. If I leave they should take a woman, another woman, in my place, no? But they don't. That is what the union is like. They say there is no need for women".

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In my department - waste - there were more men than women. The women were asked to leave. We said we would not go and we told the union. But then the supervisor got after us. He began to harrass us, kept finding fault with us. We finally felt we could no longer take this - we were losing our self-respect so we left.

(Ibid, pp. 42.43).

The aging of the female workforce without fresh recruitment. was one method by which maternity benefit could be avoided. (Ibid, p.44).

"They prefer men because women have to be given leave for delivery and paid maternity benefit ---- They do take, unmarried women but they prefer women who have had an operation".

I worked in the reeling section. They stopped giving material in our section. They said that the work had reduced but we knew that material was being sent to other sections. you see, if they gave women work, then they would have to give maternity benefit also.

(Ibid, p.43).

Maternity benefits acknowledge that a woman is both a worker and a mother. By compensating her for her motherhood it sanctions her in both roles simultaneously. But the 'dominant ideology' does not give her the liberty to fulfil both roles. Rennana Jhabvala, in her study on the women textile workers of the Ahmedabad Mill explore the fact that the decline in female employment is due to mechanisation and not to payment of maternity benefits. Then why is the ~~in~~ incorrect view so widespread and accepted? (Jhabvala, 1985, p.49).

The women workers in the textile mills lost their jobs due to mechanisation and the fact that the retired women workers are replaced by men workers.

3. Type of occupations of women workers -

Technological innovations leads not only to job loss, but to deskilling. Deskilling undermines the job ladder as old jobs are abolished entirely and new ones created. The definition of what constitutes skilled work, however, is not static but changes with economic and social conditions. When jobs are scarce, men are employed on new machines with the argument that women cannot handle the new technology - even though the new machines may require less skill to operate. (Chapkis and Enloe, 1982, p.20)

The decreasing trend in women's participation rates started around 1971, and has continued since then. (Baud,1984,p.34). The Report of the Committee on the status of women in India (1974) reveals the concentration of women at the lower levels of the production process.

The following table will indicate the women employees at production level.

TABLE VI WOMEN EMPLOYEES ACCORDING TO DIFFERENT CATEGORIES AT PRODUCTION LEVEL IN (PRIVATE SECTOR) IN THE TEXTILE INDUSTRY

No, of Units included	Total women employed	Female emp. at production level and % to total emp.women	Super- visory	Skill Semi- skilled	Unskilled	
14	2267	1925 (84.91)	-	370 (19.22)	1154 (59.95)	401 (20.83)

Source: Report of the Committee on the status of women in India, 1974, p.198

From the table, it is seen that the large concentration of women workers is at the semi-skilled level (59.95 per cent) with a substantial number of unskilled workers ( 20.83 per cent). But there is not even a single women at the supervisory level.

Women are made to do low skill, low wage, low productivity jobs in the textile industry.

Amrita Chhachhi in her study found that from the inception of the textile industry itself, women were employed only in certain departments - in cotton cleaning, reeling and winding, which were sections in which power equipment was not generally used until well after World War I. Some were employed as sweepers and on spinning frames. They rarely seem to have been employed as weavers.

'Sex segregation' in textile production existed even before the passage of the Factory Acts and persists today. While men have been substituted for female labour in certain departments. Women never entered occupations which had been the preserve of men.

(Chhachhi, 1982, p.40). Men workers are kept on the new machinery whenever it is installed while women workers are kept on the older and non-automated machinery. (General Report and Training Requirements in the Textile Industry in the light of changes in the occupational structure,1978).

Women have access to only two out of nineteen functions currently existing in most mills. The access

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to these functions has remained fairly steady until recently, whereas other functions have increasingly been lumped together by the management in order to increase labour productivity. Currently, it is becoming even smaller, because the mills are changing over from women to men in the cone winding department. This is being done according to the management, because they want to work in three shifts, which women are not allowed to do under the existing factory regulations.

The segregation between men and women by function has been complete in most departments : in eight out of ten departments only men work. In one department only women work (reeling). Women reelers are among the lowest-paid operatives, fourth on a scale of fifteen; and over the period 1970 to 1981, the percentage increase in basic wages for winders has been slightly above average and less than average for reelers. The integrated situation in the winding department is a temporary phenomenon. ( Baud, 1984, pp. 35.36).

Overall, Baud finds that the rationalisation of production ( based on technological innovations, increasing labour and machine productivity) particularly affects women workers in labour intensive parts of the production process. Women tends to be increasingly relegated to such parts of production which are subsequently automated. This occurs within the context of increasing labour mobilization. (Report on the Women, Technology and Forms of Production, 1984, p.16).

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4. Increase in the work-load -

In the textile mills, since the mid-sixties profits have decreased, leading managements to increase labour and machine productivity and change the type of product they make. (Baud,1984,p.17). This has been done by renewing machinery, by creating higher workloads per shift for the workers, and making more use of second and third shifts. This has immediate consequences for the use of women's labour, because the Factory Act regulations forbid them to work in those shifts.

The results were compared by department, as the spinning department, the reeling and winding departments are the most labour-intensive areas. Women work mainly in the latter two departments. In the Spinning Department, 41% of the total workers are located and in the reeling department 14% on average, and winding 12% on average in the sample mills. In the spinning department the modernisation of machines has contributed most heavily to higher productivity (57%) and increase in workloads by 42%. (SITRA, 1979). This means, that in order to keep up with the productivity increase in the spinning department, the cone winding department must be working more shifts.

These changes have had a large impact on women whereas the number of men working has increased by 14% in the sample mills ( the study was conducted by Isa Baud on the Coimbatore Textile Mills) from 1971 to 1980, the

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number of women has decreased by 9%. This is obviously due more to the use of three shifts rather than the other protection women have, such as maternity leave, as the latter has been paid for by the government since the early seventies. (Baud, 1984, pp.35.36). Figures from 1972 to 1980 show that the average number of workers employed in the third shift in spinning (+28%) as well as weaving and preparatory (+40%) has increased enormously. This correlates to a certain extent with the decrease in number of women workers, as women are not allowed to work in the second and third shifts, and thus become difficult to keep on in a rotation system (Ibid, pp.12-13).

5. Wages - The Report of the Committee on the status of women in India found that in most of the older industries such as the cotton textiles, the majority of the occupations employing women are mostly of an unskilled and semi-skilled nature. This enables employers to keep their wages at levels lower than the male workers. (Towards Equality, 1974, p.195).

The following table will show the average daily wage rates for men and women workers -

**TABLE VII** AVERAGE DAILY WAGE RATES FOR MEN AND WOMEN IN SELECTED OCCUPATIONS IN THE COTTON TEXTILE INDUSTRY

Occupations	Minimum		Maximum		Average daily earnings	
	Men	Women	Men	Women	Men	Women
Head Jobber	9.08	6.18	28.41	6.18	15.13	6.67
Jobber	6.60	5.11	9.59	5.39	7.97	3.30
Weaver	5.10	1.84	6.32	1.84	7.59	1.50
Drawing Tenter	5.15	4.86	5.65	5.25	5.35	4.44
Residual Occupations	4.54	3.96	9.33	5.38	6.34	4.51
All occupations	4.93	4.36	7.01	5.06	6.06	4.76

Source: Report of the Committee on the status of women in India, 1974, p.194

From the table, it is seen that the difference in wage rates between men and women are present in both minimum and maximum rates for all the above occupations. In some occupations like Head jobber and jobber, the average wage rates of women are nearly half to that of men wage rates. In the case of weaving, the average wage rates of women are five times less than that of men working (for the same type of work).

Women's wages are on the average are less than those of men.

In the Coimbatore Mills, women reelers are among the lowest paid operatives, fourth on the scale of fifteen. Women winders in contrast are in the functions which is second-highest paid among all functions. Over the period 1970 to 1981, the percentage increase in basic wages for winders has been slightly above average (2.6% per year) and less than average for reelers (2% per year).

Taking into consideration the trend in women's employment towards concentration in the reeling department it can be said that women's wages on average are lower than those of men.

Another component in the wages for mill workers is the bonus. Bonus is the yearly payment made to workers before Diwali (on the basis of the profit made by the mills. For most women workers, the bonus was between Rs.500-1000 in 1981. For men this would be higher, because it is linked to the income level of the workers. (Baund, 1984, pp 41-42)

6. Discrimination Against women workers -

In an attempt to maximise the absolute net value added per worker, the employers tend to discriminate against women. This is because under the Industrial Regulations Act women workers are to be provided with certain basic facilities like creches, women's toilets etc. which increase the per worker cost. This also occurs because of the fact that the Regulation Act also speaks of equal pay for equal work though women cannot be employed at all odd hours of the day. (Acharya, 1982, P. 6-7).

There have been a number of laws enacted to protect the women workers against serious risk or bodily injury, hard labour and the strain of the double burden of motherhood and work. (Jhabvala, 1985, P. 8). Factory Acts on limitation of hours of work and protective legislation led to the gradual reduction of women workers in the industry. Factory legislation also further differentiated between men's and women's work with women being pushed into the narrow range of lowest paid occupations. (Chhachhi, 1982, P. 39). One wonders if any real representative of women workers was present when the limit was fixed or whether the trade union and the government made any serious attempts to make the owners adjust to this limit, other than just throwing out the women.

The other protection that has been cited as a reason for decrease of women workers is that women are an extra cost on owners because of the maternity benefits and creche costs they have to pay. This argument, however, "cannot be

sustained as the total expenditure under the maternity benefits Act between 1961 and 1970 is negligible. For factories the amount paid under the Act varied between 7.27 to 11.77 lakhs as compared to over 1.75 crores under ESI. (Jhabvala, 1985, P.8). As for the other welfare provision e.g. creches and sanitary facilities, the expenditure involved is negligible. Many employers don't provide separate toilets or rest-rooms. Where they do exist, the arrangements are inadequate. Creches are very often only a room without proper arrangements (Report of the committee on the status of women 1974, P.191). Similarly a study done by the labour Bureau says "the money burden imposed by legislative and other provisions relating to maternity benefits, maintenance of creches and other special facilities for female workers were not the cause for reduction of women's employment in various industries". (Study on Employment of Women in selected Industries, 1977).

In spite of a lack of factual basis, the workers in the textile industries firmly believe that maternity benefit payments and provision for creches is the main reason for expelling women workers. It is unfortunate that the Union officials and workers, both male and female, accept this justification without protest. This easy acceptance indicates a two-fold betrayal of women worker's interests. First, it shows an acceptance of the 'supremacy of profit' over the needs and welfare of the workers. Secondly, it accepts that a woman should completely bear all the responsibility of maternity and be penalised if she fails to do so. It

assumes that a woman's role as a mother is her individual problem and must not interfere with her role as a worker. (Jhabvala, 1985, P.9)

Trade Unions and Government in their anxiety to 'protest' women, forgot at the same time to protect their means of livelihood.

7. Health Hazards of cotton textile workers -

Working conditions in most of the textile mills are known to be very bad. Dust, heat, noise, contact with dangerous chemicals and high frequency of accidents are the most common occupational hazards. (Dogra, 1985, P.267)

According to the latest report of the occupational Health Centre, an affiliate of the IIRC, Lucknow, nearly 85 per cent of 72,000 odd textile mills workers of Kanpur are possibly suffering from Byssinosis, a disabling lung disease. (Mukherjee, 1985). It is characterised by tightness in the chest and breathlessness. In its later, disabling stage this disease is difficult to distinguish from chronic nonoccupational lung disease. Cotton contaminated with leaves, stems, dust etc. is responsible for causing Byssinosis. (Dogra, 1985, P.267)

Another serious health hazard is thermal Stress. According to expert opinion, with sustained temperature beyond 100F and relative humidity of 80-90 per cent, a worker may experience heat stroke, vomiting, giddiness and may even become unconscious.

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According to an expert, Dr. V.A. Shenai :

In the textile industry various chemicals are used for carrying out various processes like bleaching, dyeing, printing and finishing. It is inevitable that workers in these operational zones will be affected. For example, inhalation of sulphur-dioxide, sulphur trioxide, carbon disulphide, etc., has been shown to increase the incidence of coronary diseases. It also brings about changes in blood chemistry and reduces the brain's ability to exert control over muscle movement. Excessive exposures can lead to fatalities. Then there is the risk of skin damage, particularly in the finishing department. Direct contact with chemicals can cause immediate damage in the form of burns or can produce long-term complaints like dermatitis, eczema and other skin diseases. The eyes, the mucous membranes of the nose, the fingers and the hands are highly susceptible.

Regarding noise pollution a senior official concerned with occupational health, S. Purushothama, says " Data from industrial workers suggest greater circulatory, heart and equilibrium problems in workers exposed to very noisy environments. The most pervasive and dangerous harm from high noise level is the permanent incurable deafness which results due to prolonged exposure to noise levels above 85-90 d BA. The workers in the spinning and weaving departments are the most affected.

These various health hazards are accentuated by the fact that the work load in most mills has been increased

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greatly, increasing the tension and exhaustion faced by the workers and making them more susceptible to the various health hazards. (Ibid, pp. 267-268)

In the Cotton Textile Industry, mechanisation effect the women workers by - direct replacement of labour, deskilling of occupations, discrimination against women workers, increase in their workload while reduction in their wages ( for doing the same type of work that men do) and occupational health hazards. The women workers are made to do low skills, lowwage and low productivity jobs in the textile industry.

b) COAL AND MINING INDUSTRY

Coal gives the country much of its light, heat and energy. But hundreds of thousands of workers who toil to make this possible live in darkness and oppression. Life is difficult and death always at the door, whether in the shape of accident, disease or the threat of unemployment. The picture usually projected of a mine worker is a man in a safety helmet with a coal pick in his hand. But in India the mining Industry also employs about 75,000 women. (Kishwar and Vanita, 1984, p.63)

Women have formed an integral part of the labour force in the coal mines right from the inception of the coal industry. As a labour-intensive enterprise, coal mining has had to depend on the availability of labour for maintaining production. Women were employed in the coal mines in large numbers from an early stage of the industry both in surface as well as underground work. They were engaged mainly in unskilled and semi-skilled tasks and with the enhancement of capital costs in mining have been increasingly faced with the spectre of displacement from their jobs. This process culminated with the enforcement of the prohibition of under-ground work for women in 1938. The process has continued unabated even till the present for it constitutes the logic of capitalist industrialisation where living labour is constantly sought to be appropriated by dead labour, thus enhancing the organic composition of labour. (Ghosh, 1984, p.1)

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Employment of women in Mines -

Employment data pertaining to major mines in India, namely, coal, mica, iron ore and manganese is tabulated in the following table -

TABLE VIII EMPLOYMENT OF WOMEN IN MINES

( FIGURES IN THOUSANDS )

MINES		1951	1956	1961	1966	1968	1969	1970	1971
Coal	T	352.0	352.4	411.3	425.5	395.4	396.4	391.5	382.2
	W	55.2 (15.7)	46.0 (13.0)	38.1 (17.0)	30.7 (7.2)	24.7 (6.2)	23.0 (5.8)	21.5 (5.5)	20.1 (5.2)
Iron Ore	T	20.2	37.3	54.5	60.3	52.2	48.6	51.8	52.8
	W	7.7 (38.2)	10.7 (28.8)	15.3 (28.8)	15.7 (25.9)	13.0 (24.9)	11.4 (23.4)	12.4 (23.9)	12.9 (24.4)
Mica	T	52.2	34.0	29.6	19.8	16.9	16.0	13.9	12.1
	W	7.2 (13.8)	2.7 (7.8)	2.4 (8.1)	1.2 (6.1)	1.7 (10.1)	1.5 (9.4)	1.3 (9.3)	1.1 (9.1)
Manganese	T	55.5	110.0	46.9	47.0	37.2	31.0	29.3	30.4
	W	24.4 (43.9)	44.3 (40.3)	17.7 (37.7)	19.1 (40.6)	15.0 (40.3)	12.3 (39.6)	11.6 (39.6)	12.2 (40.1)
Others	T	69.1	94.9	128.7	146.7	142.6	146.5	151.7	153.0
	W	15.1 (21.8)	22.0 (22.1)	32.8 (25.5)	33.9 (22.9)	29.9 (20.9)	29.9 (20.3)	30.4 (20.0)	28.9 (18.8)
Total	T	549.0	628.6	671.0	699.3	644.3	638.5	638.2	630.7
	W	109.6 (20.1)	125.8 (20.0)	106.3 (15.8)	100.7 (14.4)	84.3 (13.1)	78.0 (12.2)	77.2 (12.1)	75.2 (11.9)

T = Total average daily employment

W = Women's employment.

Source: Indian Labour Statistics

The above table indicates the trend of women's employment in the mining industry. The total employment of women in mines has declined from 1.09 lakhs to 0.75 lakhs

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whereas total employment in mines has increased from 5.49 lakhs to 6.30 lakhs. The women's share of employment in mines has declined from 21.1% to 11.9%, i.e., a decline of 47.4%. The heaviest decline has been in coal mines - from 0.55 lakhs to 0.20 lakhs. While total employment in coal mines increased from 3.52 lakhs to 3.82 lakhs, the decline in the women's share is by 66.8%. In iron ore total employment increased from 0.20 lakhs to 0.52 lakhs. The number of women has increased from 0.07 lakhs to 0.12 lakhs. Their relative share of employment in iron ore mines has, however, declined by 36.2%. In mica both total employment as well as women's employment has registered a steady and sharp decline. The women's share, however, has declined still faster by 34%. In the manganese mines though the number of women has halved during these 20 years their relative share has not changed so much - declining from 43.9% to 40.1% i.e. by 8.65%. In all other mines total employment has increased from 0.69 lakhs to 1.53 lakhs. The number of women increased from 0.15 lakhs to 0.33 lakhs in 1966, but has been declining since then. Their relative share has changed from 21.8% to 18.8% - a decrease of over 13.7%.

Coal mines employ the largest number of women. In the past they were engaged in both underground and surface work. (Towards Equality, 1974, p.191). Coal mining till the years of World War-I was a primitive operation. The mines were shallow, often less than a

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few hundred feet in depth and the coal was excavated in the form of quarrying, outcrop mining or inclines. Pit or shaft mining was still rare. But as the surface stratas of coal began to exhaust and better quality coal was found underground at a greater depth, even inclines were not sufficient and 'pit mining' had to be resorted to. An element of mechanisation became necessary.

The gin<sup>1</sup> came into existence and coal was drawn by a rope wound round a gin turned by women labourers. Later steam haulages came into existence. When the distance of haulage became longer and the seams had to be worked deeper down, working by shafts and pits came into being and greater mechanisation of haulages etc. became necessary. To work a quarry did not require much capital or skill and technical knowledge. (Ghosh, 1984, p.5). But to sink a deep shaft capital was required and mining became not a matter of cutting coal but a specialised technical process of engineering .... " (Mehta Committee Report, 1956, p.13).

In 1919 women formed 38.1% of the colliery labour force and for every 10 men employed underground, there were 7 women for the same job. (Towards Equality, 1974, p.191). In 1921 there were 6 women for every 10 men comprising 37.9 per cent of the total coal workers. The

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1. Gin - Each gin had four horizontal arms and to each arm about eight women were appointed so that each gin was driven by thirty-two women.

slump in coal demand after the World War-I required a toning up of the system of production and this systematisation was attempted through the abolition of the family system of work and the introduction of the shift system. Certain technological development also facilitated its demise. (Ghosh, 1984, pp.3,7).

In 1929 Government of India ordered a gradual reduction in the number of women working underground. By 1930 the ratio of women as to men working underground reduced significantly from 3.4 women per 10 men in 1929 to 2.5 women in 1930 (Simons, 1976, p.484). A total ban was promulgated in 1939. The number of women dropped to 11.4%. (Towards Equality, 1974, p.191). Women's labour which had served as a subsidy for the industry within the family system of work was exhausting its utility as the coal industry became more 'capital-intensive'. (Ghosh, 1984, p.7). The motive professed for throwing thousands of women out of work was concern for their safety and welfare, as conditions underground were supposed to be unsuitable for the 'weaker' sex. This was a convenient way of evading the real issues. Since women had all along been doing the same jobs as men, the problem was not that the work was too hard for women but that the working conditions for all, men and women, were and continue to be inhuman. The fact that workers are plentifully available, even for work that means death - as for instance in the silica mines, where inhaling of poisonous dust corrodes the lungs, slowly and painfully killing the worker - only points to

the prevailing poverty and destitution. To throw women out of jobs and into starvation is a strange way of showing concern for their welfare! It only makes them more dependent on their husband's earnings and leaves them absolutely helpless if their men get disabled, die or lose their jobs. (Kishwar and Vanita, 1984, p.63).

As pit-making became more prevalent and shafts had to be sunk deeper to gain access to the superior quality coal ( i.e. having less also content) production had to be accelerated which called for the installation of rudimentary devices. For instance, the need for more powerful haulage led to the installation of mechanical haulage powered by steam or electricity according to the size and resources of the mine. Similarly hand bailing of water was replaced by pumps. Trimming operations were increasingly taken over by men as it became a more skilled operation underground. Even underground loading operation which had been considered the prerogative of women began to be done by the migrant workers who came from eastern U.P. and Madhya Pradesh. As this migration increased from the early 1920s the actual phasing out of women from underground work was already underway much before the official phasing out scheme between 1920-38 took shape. It was the inherent logic of 'capitalist development' in the coal industry which replaced one social segmentation of labour by another in keeping with the interest of the industry.

Deeper mines entailing increased capital expenditure

in pit sinking and the requisite mechanisation meant that in order to fully utilise the capital equipment a change in the social organisation of labour had to be effected. As the demand for coal picked up after 1926 this reorganization was put into effect. Thus the larger mines began to use electric power for underground installations. Electricity meant continuous illumination as well as greater power for haulage and pumping. It was consequently possible to introduce the 'shift system' rather than allowing the coal cutters to work continuously underground. This is evident from a perusal of the development of mechanisation as indicated by the use of coal cutting machines.

TABIE IX      USE OF COAL CUTTING MACHINES IN COAL MINES  
( 1925- 1945 )

Year	Total No. of working Mines	Total No. of mines using coal cutting machines.	No. of coal cutting machines used.
1925	810	-	125
1930	549	62	202
1935	494	36	95
1940	618	69	205
1945	673	76	232

Source : Journal of Mines, Metals and Fuels, 1962  
(Special number), quoted in (Ghosh, 1979, p.153).

The reduction in the number of working mines along with the number of mines using coal cutting machines and their total number in 1935 reflects the impact of the depression. At this time infrastructural development

received a setback and the colliery owners were intent upon cutting the cost of production. The axe obviously fell upon the workers and when at this time the ban on underground work of women came into effect it proved to be a boon as it reduced the strength of the coal workforce by a third. (Ghosh, 1984, p.9)

What induced the government to be so 'humanitarian' towards women while remaining unmoved by the hazards faced by men workers underground and equally callous to other kinds of dangers faced by both men and women workers overground? The hypocrisy and hollowness of this humanitarianism was exposed, when, during the Second World War the ban on women working underground was lifted. The government needed more fuel for an efficiently destructive war machine and women could be used as fodder in the mines. (Kishwar and Vanita, 1984, pp.63-64).

With the relaxation of the ban on women, employment of women in the mines registered a sharp increase between 1944-46. In 1843 there were a total of 39,125 women working in the coal mines, it rose to 61,055 in 1944 and 77,784 in 1946. (Labour Bureau, 1953, p.88). In 1944-45 women constituted 24.7 per cent of the total labour force in the coal mines. By the end of the war women's employment in the collieries had reached its peak. (Ghosh, 1984, p.10). In 1946 the ban was reimposed and the women again thrown out of work. Their number declined slowly to around 55,000 in 1948-50. (Ghosh, 1984, p.10). In the year following 1946, the number of women in coal

mines declined because of the introduction of new methods of surface screening and coal handling (Towards Equality, 1974, p.191). Men workers were trained to operate the new machinery. Women were thrown out under the plea that they were illiterate and not capable of learning modern techniques. (Kishwar and Vanita, 1984, p.64).

The technological development in the coal industry had cast the die of redundancy for women. The trend has continued even after independence and also nationalisation of mines. (Ghosh, 1984, p.10)

Before its nationalisation in 1973, the Coal Industry was well known for its labour-intensive method of coal extraction and tardy mechanisation capital investment was kept to the minimum. Since then the situation seems to have changed dramatically. (Ghosh, 1981, p.1485). The logic of capitalization was not stemmed even after the nationalisation of the coal mines in 1973. In fact the process has if anything received a fillip and labour saving devices have been imported into the coal mines at an accelerated after 1973. (Ghosh, 1984, p.11). During the last three years capital expenditure, largely for the purchase of machinery has increased from Rs.51.37 crore to Rs.101.76 crore. In this the cost of imported machinery has leaped from Rs.2.27 crore to Rs.23.01 crore. (Ghosh, 1981, p.1485). The victims have been women and other sections of the unskilled labour force mostly from socially depressed groups. (Acharya, 1982, p.13; Ghosh, 1984, p.11)

Impact of Mechanisation on women workers -

Mechanisation was meant to boost production. Yet more than increasing production this kind of mechanisation was reducing employment opportunities. Colliery workers felt that although mechanisation was not intrinsically bad, yet the kind of mechanisation which was occurring in the coal fields was adversely affecting the workers. Rapid mechanisation of coal loading operations made redundant the contract labourers engaged in it. Consequently, the employment of 32,938 contract workers were in jeopardy. Most of them were local Harijans and tribals including women. Over the last three years, over 5,000 women had lost their jobs.

1) Reduction in the number of women workers - There is inappropriateness of mechanisation in the coal mines. Instead of acquiring better safety equipment, large capacity pumps or improving underground ventilation which would create better conditions of work and facilitate production, the management was intent upon reducing the number of workers. Previously 'picking' work and 'loading of the coal' into trucks and railway wagons, was done by women workers. But now that work has been replaced by 'mechanised loading'. Mechanised loading created other kind of problems. Along with coal, the 'pay loaders' also loaded stone, dust and rubble. When used at the thermal power plants this mixture caused

mechanical trouble in boilers. Manual loading since it also involved 'picking' or the separation of stone and rubble from coal had advertised this problem.

Illina Sen in her study on Iron Ore Mines at Dallij Rajhara (District Durg, Madhya Pradesh) observe that in the existing situation, skill and educational requirements for work in the mechanised mines have debarred women as they have debarred the local population. (Sen, 1986, p.4).

II) Types of occupations occupied by women workers in

the Mining Industry - The Report of the Committee on the status of women in India, 1974, pointed out, not only in mines but in most of the older industries, the majority of women are employed in unskilled or semi-skilled occupations. (Towards Equality, 1974, p.195). The following tables indicate the type of occupations engaged by women workers in the mining industry -

TABLE X NUMBER OF OCCUPATIONS EMPLOYING WOMEN IN MINING INDUSTRY. INDUSTRY OCCUPATIONS IN WHICH WOMEN CONSTITUTE 5% OR MORE OF TOTAL EMPLOYEES.

Industry	Total no. of occupations selected	Number in which women form 5% of employees.	Name of occupations in column 3.
<u>MINES</u>			
Coal	26	5	Sweeper, general mazdoor (earth-cutter, stone cutter, crushing mazdoor), Shale picking mazdoor, loader/unloader, miner.
Iron Ore	31	4	Reza/mazdoor, sweeper, skip loader, miner.
Mica	20	2	Surface mazdoor, Reza residual occupations.
Maganese	28	12	Ore washing operations, excavator, loader/unloader, mazdoor, digger, sweeper, carrier, open cast miner, sorter, scrooner and cleaner, dresser, miner.

Source: Second Occupational Wage Survey (1963-1965).

**TABLE XI** WOMEN EMPLOYEES ACCORDING TO DIFFERENT CATEGORIES AT PRODUCTION LEVEL IN MINING INDUSTRY

Sectors	No. of Units included	Total women employed	Female emp. at production level and percentage to total employees women	Super- visory	Skill	Semi- skilled	Unskilled
Private Sector	1	661	649 (98.18)	-	5 (0.77)	1 (0.15)	643 (99.08)
Public Sector	5	33,978	16,588 (48.82)	3452 (20.8)	4994 (30.11)	6258 (37.73)	1884 (11.36)

Source: The Report of the Committee on the status of women in India, 1974, p.198.

From the above data, it is clear that the majority women workers in the mining industry are in the unskilled and semi-skilled occupations. In the private sector, 99.08% of women are in the unskilled occupations, while none at the supervisory level. The situation is a little better in the public sector, where 20.8% of women are found at the supervisory level. It would appear, therefore, that the public sector is over-throwing the existing prejudices against appointment of women in higher levels of the production process at a faster rate than the private sector.

Women have been assigned only particular kinds of work in the mines, mostly unskilled work vulnerable to mechanical appropriation. Increasingly, it has been believed that they were only suitable for these kinds of jobs.

Consequently, there has been no attempt either to impart training and skills so as to enable them to adjust to the reorganisation of work. The other trend in many industries is that while male workers may graduate from one level to another, women workers tend to remain at the level at which they are recruited. (Towards Equality, 1974, pp.198,200; Ghosh, 1984, p.10). The stereotyping of women's functions in the mining industry is conveyed by the remarks of the Senior Personnel Officer of the Indian Mining Association, the premier body of the mine owners, when he states : "It is the general opinion of employers in coal industry that there are certain jobs for which women are more suitable than men. These are jobs like sand loading and wagon loading." (Labour Bureau, 1953, p.20). Women are observed to carry baskets of ore weighing upto 35 kilograms. In the stone mines, the highest proportion of women (46%) are employed on the stone crushing machine as unskilled labour. These women carry headloads of material upto the machine, while in technical processes of running the machine, only men are employed. (Kishwar and Vanita, 1984, p.65).

As the low level of jobs have been taken over by the machines reducing the problems of managing people, these have been adopted by the mine management thus enhancing the dispensability of women labour. (Ghosh, 1984, p.11)

III. Unequal pay for equal work - The Equal Remuneration Act, 1976, is supposed to have come into force in mines from May 1977. Before independence, women did only the

heavier jobs but were paid much less than men. In those days, employees generally preferred to recruit female labourers. As various Minimum Wage Acts and wage Awards came into force in different States and the concept of equal pay for equal work was gradually introduced, women almost ceased to be the source of cheap labour for employees. This is a major reason why employed are now trying to get rid of women workers and follow the 'policy of discrimination' during recruitment. (Kishwar and Vanita, 1984, p.65).

In 1975, the Labour Bureau decided to conduct a study of the condition of women mine workers which is covered by the Mines Act, 1952. About 6% of coal mines and 8% of other mines in each State were studied.

The study found that seventy-one per cent of women are in unskilled and 29% in semi-skilled jobs. There is not a single women holding an administrative, executive or managerial position in any of the mines, neither are women ever promoted from unskilled to semi-skilled or supervisory levels. By keeping women in the lowest-paid, unskilled jobs and never allowing them to move to higher paid jobs, the employers cleverly evade the equal wage legislation. (Quoted in Kishwar and Vanita's Book, 1984, p.65) The similar trend has also been observed by the Report of the Committee on the status of women in India (Towards Equality, 1974, p.195).

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The following table will give an account of the average daily wage rates for women and men engaged in similar occupations in the mining industry.

TABLE XII AVERAGE DAILY WAGE RATES FOR WOMEN AND MEN IN MINING INDUSTRY

Industry	Minimum		Maximum		Average Daily earnings	
	Men	Women	Men	Women	Men	Women
<u>Maganese</u>						
<u>Mines</u>						
1) Ore washing Operators.	2.11	1.46	3.65	2.59	2.50	1.81
2) Mate	2.48	0.98	3.29	0.98	2.63	1.08
3) Loader/ Unloader	2.03	1.43	2.27	3.28	2.29	2.27
4) Miner	1.50	1.28	3.21	2.81	2.81	2.12
<u>Mica</u>						
1) Dhani	1.76	1.00	1.85	1.00	1.72	1.00

Source: The Report of the Committee on the status of women in India, 1974; p.195

The above table indicates that the principle of equalisation has not been seriously applied in the mining industry. There are differences in wage rates between men and women in both minimum and maximum rates. The average wage rates of women workers are much lower than those of men. Women are quite blatantly paid less than men for doing the same jobs. Thus, in maganese mines, the male ore-washing operator earns Rs.2.50 daily and the women Rs.1.8/-. The male helper earns Rs.2.63 and the woman Rs.1.08/-.

In the iron ore mines, women get 67% less than men in their minimum total pay packet and 80% less in the maximum pay packet. The average weekly earnings of women workers employed in open cast workings in iron ore, graphite and bauxite and above ground in asbestos mines were even less than half the corresponding earnings of men.

Besides this direct breaking the law, the employers also indirectly evade it by not employing men and women for the same jobs so that they do not have to pay them the same wages. The lowest-paid jobs are reserved for women.

According to the S.O. Wages Survey, this restriction of women to a few selected tasks is one of the most important factors adversely affecting women's employment, and the condition of women in the mining industry is typical of their condition in industry generally. (Kishwar and Vanita, 1984, p.65).

Women are engaged in mining industry both in surface as well as underground work in unskilled and semi-skilled tasks. With the enhancement of technological innovations in mining, it has an adverse impact on the nature of employment, working conditions, wages, health and recruitment pattern of women workers.

C) DAIRYING INDUSTRY

An inquiry to identify the industries absorbing women labour power shows that 50% of the women workers worked in non-farm sectors and one of the most leading industry in the 11 industries was live-stock and dairy products industry. (Draft Five Year Plan, 1978-83, p.103). A field report also shows that primary functions in dairying such as washing, cleaning, milking, feeding and other allied activities in dairying are undertaken by women. (Nair, 1979). In the area of dairying, one of the most significant projects of modernizing the rural economic activity is the large scale implementation of "Operation Flood" which has in-built possibility of modernizing production, processing, marketing and distribution (Shah, 1981, pp.8-12; 15th Nov., 1980).

'Amul' (Anand Milk Producers Union Limited) was born in the Kaira District in the State of Gujarat, with its headquarters at Anand. The Amul Union, with 8 villages milk cooperatives and 432 members entered the scheme in 1948 and began to supply 5000 litres of milk daily to Bombay. Today this plant employs about 2000 persons and produces milk production of various types. Today the Gujarat State milk farmers marketing Federation include about 2,50,000 members, and nearly 900 cooperatives. Its phenomenal success in finding over growing markets, and in generating income in the rural sector resulted in the model being adopted for a National Dairy Development Programme "Operation Flood" - which aims to involve about 10 million rural families in its network in 24 'milk

sheds' already identified in the country. (Mazumdar, 1979, p.9)

The basic objectives of Amul are increasing productivity and establishing a smooth flow of supply of milk from the source to the market or processing centres. It offers various services to its members - the supply of veterinary services and cheap but quality fodder, training in cattle breeding, artificial insemination and modern methods of cattle care. Daily payment of milk received at collection centres, tested for its fat content, ensures a regular reasonable income to the family, and has relieved many of them from the spectre of perpetual indebtedness. Dairying is now an 'organised industry' in Gujarat. (Mazumdar, 1979, p. 10).

It is important to look at the Anand Experience in terms of its impact on women because dairying is traditionally an area of women's employment, and presently in developing countries, dairying is being seen as an important element of employment, health and planning, in particular India is implementing a dairying programme (Operation Flood I and II) using 'Anand' as a model. Anand is based on the concept of cooperative marketing of milk linking the rural dairy farmer to sophisticated technology and ensuring even the smallest producer a regular income. Anand offers an opportunity to study a model of rural women's employment. In this light of organised marketing and the resultant increase in income, some of the variables which can be examined are the impact

on women's physical effort, on intra-household work allocation, on women's access to income and on family health and welfare. Additional Anand provides an opportunity to test the hypothesis that introduction of modern technology cause displacement of women by an erosion of their economic roles. There is also the question of women's participation in the village level cooperatives since the cooperatives may emerge as powerful local institutions and could undermine women's status of the women were not members.

Impact of Dairy Development on women -

Dairying is the traditional occupation of women. The traditional division of labour with regard to dairying chores is as follows- Women are associated with animal husbandry activities performed at home, while men perform tasks outside the home. On the whole, women spend more time in dairying activities than men though it is not true in every State. In Gujarat, women have been traditionally central to dairy management in the households. With the advent of Amul shifts have occurred in intra-household work association and in participation of men and women as dairying farmers.

Dairy development could make substantial impact in the participation, status, attitude and motivation, social and economic status, and income and consumption levels of women. (Shah, 1985, p.129)

1. Women's participation - There are three dimensions of direct women's participation in the dairy industry-

The first dimension of direct participation lies in the involvement of women producers in the field of dairy cooperativisation. (Shah, 1985, p.130). Though the initial planning of either AMUL or Operation Flood did not specifically think of the project as one for advancing women's development, by a sociological accident, the occupation of dairy- production and marketing in Gujarat was mainly practised by women, surprisingly enough, however, in the complex structure of decision making, with village level primarily cooperative societies at the bottom, then elected bodies at the Taluka, district and State level, women have hardly any place. Data from 481 cooperatives in the Kaira District show that women form only 10% of the members. Field data from 10 villages show female membership ranging between 2.3 to 10%, with only two exceptions. With the exception of one all women's society, the majority of women members are successors of men from the families who died, or are dummy members - to enable a single family to acquire a larger number of shares. While the all-women society is managed entirely by women, managing committees of other societies do not have women. (Brandtzaeg, 1979, p.1922; Mazumdar, 1979, p.9)

The second dimension of the women's participation is then involvement in the management. (Shah, 1985, p.130). Traditionally, dairy production and marketing were mainly carried out by women, particularly of the poorer castes.

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In today's dairy industry both the management as well as the rewards has been moved out of women's hands. Of the more than 2,000 persons employed in the Amul complex, there is only one women veterinarian and a few telephone operators and secretaries. Managing Committees of majority of the societies do not include women. No one women has been given mastery over the new technology that has been taken over their traditional tasks of making butter and cheese. (Brandtzaeg, 1979, p.1922)

Amul management's response to queries regarding women's participation in the decision making process so far has been the same as that of other planners - as long as the family is represented in the society, surely the women are sharing the benefits! And this inspite of the high rate of participation by women in income-generating activity. In the 10 villages surveyed by case study, female participation rate was 48.3%. (Mazumdar, 1979, p.9) There is no built-in provision in the Anand pattern to accommodate or encourage women aspirants to these posts. Tradition also weighs against women's elevation to position of operational authority in the village.

The third dimension of women's participation is their multiple roles in the various spheres of life. Though fewer women were engaged in income generating work than men, all women were engaged in domestic work, and half (48.3%) were engaged in an income generating activity in addition to domestic tasks. In the landless

dairying households, women often performed three functions simultaneously - agriculture, dairy farming and domestic work - and their participation rate was much higher than in any other category. The average work day was 12 hours with 7.1 hours for domestic work, 2.6 hours in dairying and 2.4 hours in agriculture. The women in landless households with cattle tended to work longer hours than the women in landless non-dairying households with the same number of hours in agricultural activities but differing in respect of domestic work. This might indicate that dairying was eroding time for child care, house cleaning, cooking etc., and adding extra hours to their working day. Women of households with some resource - base tended to have lower participation in income generating activities, including dairying. This might indicate a trend towards 'Sanskritisation' where women's work is associated with a loss of prestige in an upwardly mobile households. (Brandtzaeg, 1979, p.1922).

II. Women's access to Dairying Technology - The programme technological upgrading at the village level has been delivered almost exclusively by male staff. In the Anand pattern there is a certain sensitivity of approach which has caused women to be included in the non-formal technical education in animal care etc., by imparting dairying education to women through men. (Singh, Jain and Chand, 1979, p.7). The training course for the care of the new breeds of cattle do not include a single women farmer.

Thus as the dairying industry becomes big money, women have been debarred from coping with it? (Brandtzaeg, 1979, p.1922).

III. Nutritional impact of the dairy development - The study conducted by Vina Mazumdar on the Kaira District indicates that in cases where real family income has increased as a result of economic change, food intake and nutritional levels have not increased accordingly. (Brandtzaeg, 1979, p.1922)

The women landless labourers who owns a buffalo works two hours a day longer than her counterpart who depend only on agricultural labour for a living. The result of this excessive strain is visible in the sex ratio in the adult population in the dairying households - 878 women/1000 men. (the national average is 930 women/1000 men). (Mazumdar, 1979, p.10).

An additional physical strain on women has been caused by a tendency to maximize dairying time to increase income without an upgrading of women's nutrition thus perhaps leading to a deterioration in health in the long run. (Singh, Jain, Chandp 1979, p.8)

IV. Impact of dairy development on socio-economic profile of rural women engaged in dairying - Dairy development has caused most profound changes in the profile of rural women. A large body of research studies is now available analysing these aspects of the dairy development in rural areas. (Srivastav, 1970; Thakur, 1975, p.87).

a) The management of the Dairy Industry claim that dairy income generating system on regular basis has influenced the economic perception and priorities accorded by rural women producers and thus has strengthened the economic achievement motivations. (Shah, 1985, p.134)

But the survey conducted by Nallni Singh, Devaki Jain and Malini Chand, shows that women do not enjoy a greater control over income in the Anand pattern than under conditions of unorganised dairying (Singh, Jain and Chand, 1979, p.8).

Vina Mazumdar case study reveal that women in the affluent family claim that they enjoy status because of their managerial functions in their families, and not specifically because of their daily income. (Mazumdar, 1979, p.11). Women are less likely to siphon off a part of the income towards inessentials and prestige - enhancing expenditure. (Branatzaeg, 1979, p.1922).

II The management claims that acceptance and adoption of modern technical inputs in the form of cattle feed, artificial insemination and animal health care services have influenced the mind and attitudes of rural milk maids and have started adopting family planning, child care, personal hygiene and food management (Shah, 1985, p.135).

It is seen that women who are members of the cooperative are somewhat better informed about the services available but there is no indication that their attitudes to caste, family planning, hygiene etc. has undergone any change. (Mazumdar, 1979, p.11). There is no evidence that

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the women's exposure to concepts of artificial insemination and biological processes has sensitised them to family planning or medical care in their own lives. (Singh, Jain and Chand, 1979, p.8). As compared to this rather dismal picture, women in the village of Khadgod-ra, with the all 'women's cooperative' display markedly greater awareness of the benefits of cooperatives, active participation of members, children's education etc. The women regard the society as their own and are confident about their ability to manage it, women in the other villages were content to plead their lack of skill for such work. (Mazumdar, 1979, p.11).

ix) Anand Pattern - Anti-Female?

v) The project has not recognised the tremendous physical hardship imposed on the landless dairying women who perform multiple role agricultural, domestic and dairying work to the extent that men do not participate in all these categories of work, the Anand pattern might be considered prejudicial to these women who come from the most vulnerable section of rural society. For the landless non-dairying women the Anand offers autotelishing source of income but the milk cooperation does not assist them in buying a buffalo. Also the low membership of females and their complete ~~absence~~ absence in the extension staff is the most convincing manifestation of the low female profile in the conceptualisation of the Anand Pattern. (Singh, Jain, and Chand, 1979, pp.9-10).

The enormous structure of the Amul Complex

at Anand with a highly modern campus of steel frame, mosaic and glass air-conditioned buildings, laboratories, gleaming aluminium and steel plants, white uniformed and capped staff (all men), beautifully laid out gardens, sound-proofed and plush-sealed auditoria and air-conditioned luxury buses seems very far removed from the lives of the village women whose work has made this glossy new world possible, but to which they have no entry.

Not one of them have acquired mastery over the new technology that has taken over their Traditional tasks of making butter and cheese for the urban consumers.

They are not even aware that they are contributors to a 'developed miracle' that is assuming the size of a national movement. (Mazumdar, 1979, p.11).

D) TASAR SILK INDUSTRY

Tasar is extracted from the cocoons of the larvae of a wild tree borne moth called Antheraca Mylitta. Tasar Silk worm is spread throughout the forest tracts in India. However, it is concentrated in a few specific zones in the forests of Bihar, Madhya Pradesh, Orissa and West Bengal. Biologically speaking, tasar silk is just a fibrous filament secreted by the mature larvae in order to spin a sort of protective shell called cocoon around itself and in which it lives in dormancy (pupa stage) for several weeks. The fibre is a fine silky filament with glazy lusture. (Moulik and Purushotham, 1986, p.202).

Conventional technology used in the Tasar Silk Industry

'Sericulture' is a labour intensive farm activity, combining intensive land cultivation with intensive silkworm rearing in the household. Sericulture is a family activity in the three main aspects : Mulberry cultivation, silkworm rearing and reeling. Male and female members handle different stages and operations within these aspects, but some stages/operations are more female labour intensive. (ISST, 1982, pp.11-12).

The following steps are used in the manufacture of silk by using conventional technology -

1. Cocoon rearers buy fertilised eggs which are then hatched and the worms are kept in 'ghara' (trays of light wood). The worms continue feeding mulberry leaves

for 21-24 days. Women workers generally help in this work. After 24 days, the worms change colour and are ready to form cocoons. They are then transferred to special bamboo frames called 'chandraki'. After 3 days of staying in the chandraki, the work finishes spinning a cocoon.

The cocoons are then boiled in an earthen cauldron and this work is done by women. (Banerjee, 1984, p.31).

II) Reeling - once cocoons are worked, the next phase in their processing is reeling and is done by two ways -

i) By a simple pedal driven machine called Trivedi machine;

ii) by thigh reeling which is most popular method and is done by women to supplement their family income.

The reeled yarn is later wound into bobbins. This operation is also done in a crude way. It is accomplished on a traditional bamboo made charka. (Moulik and Purushottam, 1986, p.204).

III. Warping :- The next phase in the process is 'wrapping' and the method employed is very crude. A wrapping bundle is lodged on a simple cross pillared wooden bed. The first ends of yarn are tied to the wrap shaft and the other ends are drawn to another similar shaft. Such arrangement enabled the weaver to examine the yarn qualities, to arrange the yarn spread over the wrap shaft in the desirable manner and design and to apply starch material (Moulik and Purushotham, 1986, p.206).

IV Weaving - wrapping and weaving are done by males with the assistance from children and women. The loom technique of tasar weavers is simple. It is a simple, slender and light framed pit loom requiring limited space. The loom is housed in the family's dwelling place. (Moulik and Purushotham, 1986, p.206).

#### Technique Improvement

Sericulture is not only labour-intensive but also technology intensive. (ISST, 1982, p.22). A specialised Institution, Central Tasar Research and Training Institute (CTRITI) at Ranchi has attempted to improve the process technique in tasar industry.

#### Improvements as alternative to the Conventional Technique

1. A new method of cocoon cooking (scientifically called stiffling) and a new cooking equipment is introduced in which cocoons are boiled, steamed, takenoff, loosely wrapped and soaked. This process is accomplished through a newly devised cooking chamber, built in three sizes. This helps to bring an uniformity in the reeling quality of cocoons. Another benefit of the modern equipment is increased fuel efficiency.

Secondly, the reeling process has been introduced by developing a new machine built on the motion model of sewing machine and operational style of new model charka with some changes, so that any desired number of twists and denier size can be obtained on the yarn.

The third facet of technique improvement has been in weaving. The Indian Institute of Handloom Technology,

Varanasi, has brought out some improvement in this front.

i) Take up and let up motions - The letting up of warp beam and the taking up of the cloth beam are released for motion by hand in pit looms. This consumes much of the weaver's time. This has now been automatized by adding two lever system which reduce human effort by over reducing one-third of the worker's time and help to improve his production.

ii) Designs - The annexation of Jacquard and Jala system has been accomplished to arrive at any design.

iii) Chennille loom - A new system has been developed on ordinary loom to enable weaving for the brist type cloth which has been found having tremendous export demand.

iv) Charka modernisation - The modern charka developed in the late 1960's, is light and gives uniformity in the bobbin and is built on a bicycle wheel which receives motion from a hand driven shaft. (Moulik and Purushotam, 1986, pp.208-210).

#### Impact of modern Techniques on the status of women workers

The technology introduced in various facets of the silk production will alter the proportion of male/female participation and indeed total employment. (ISST, 1982, p.16). Therefore, it is essential to examine the impact of modern techniques on the employment pattern, wages and overall status of women workers.

1. Loss of self-employment for women workers - The implication of the growing trend in the population adoption of large and smaller size cookers is that a new class of resource-ful entrepreneurs has come into operation in the industry. These individuals/firms acquire the chambers and stifle the cocoon by a few hired hands. This means loss of self-employment for a large proportion of women. (Cocoon-cooking is a traditional occupation for women).

The machines introduced, though simple and can be adopted with little training, seems to be intricate to the weaver families, particularly to the women. The improved machine could be popular only with the educated and trained hands. The new reeling technique has a tendency to generate a definite structural change in the employment relationship in the industry. What is most certain is the decline of the silk reeling activity carried out by the women folk giving place to a small number of machines employed hands.

A 'specialised division of labour' has come to stay while the men have to get themselves ready to weave with finer denier yarn, the women need to take up other occupations or be under-employed. (Moulik and Purushotham, 1986, pp.210-211).

## II. Lesser wages and more physical labour to woman workers

In the silk industry, the majority of women workers are engaged in unskilled or semi skilled occupations. Also,

differences in wage rates between men and women are present in both minimum and maximum rates. The Report of the Committee on the status of women in India (1974) reveals that the difference in wage rates of unskilled labourer and semi-skilled worker is due to prejudices, rather than skill or productivity differentials that determine wage difference between the sexes. (Report of the Committee on the status of women in India, 1974, p.193).

The following table will give an idea about average daily wage rates for men and women workers in the Silk Industry -

**TABLE XII** AVERAGE DAILY WAGE RATES FOR MEN AND WOMEN IN THE SILK INDUSTRY

Type of Occupation	Minimum		Maximum		Average Daily Earnings	
	Men	Women	Men	Women	Men	Women
Reel & reed repairer	3.81	4.15	4.33	4.15	4.23	3.36
Warper	4.31	2.62	5.08	2.62	4.88	2.94
Asst. Warper	3.42	1.01	3.75	1.01	3.61	1.00
Stentering machineman	3.96	2.39	4.71	3.46	4.33	3.04
Mazdoor	3.78	2.72	4.15	3.05	3.75	2.99
Weavers	4.08	2.08	6.69	2.95	5.42	2.50
Creel boy	3.60	1.59	3.73	1.63	3.76	1.60
Ricker	1.20	1.08	1.75	1.11	2.82	1.11
Silk examiner	2.89	2.03	3.55	2.14	3.22	2.08
Cooker	2.87	1.87	2.87	1.93	4.07	1.90
Sorter	1.81	1.96	2.48	1.97	2.10	1.96
Doubler	2.09	1.28	2.48	1.38	2.31	1.62
Residual occupations	3.65	2.59	7.08	3.33	4.63	2.92
Cut Looker	4.38	3.84	4.55	4.11	4.51	4.00
All occupations	3.90	2.11	5.87	2.34	4.84	2.38

Source: Report of the Committee on the status of women in India, 1974, p.194.

From the above table, it is revealed that there is a difference in the wage rates between men and women workers,

whether it is an unskilled or semi-skilled or skilled occupation. In all the occupations in the silk industry, an average daily earning of a male worker is Rs.4.84 as compared to a woman worker whose average daily earning is Rs.2.38.

Wage structure in the government filature factory at Malda is particularly interesting. 'Women reelers' do the physically most tiring and also the more skilled job demanding attention and accuracy. Women workers stand at a long row of eyes to which they feed thread picked off cocoons simmering in a tub of coater. Each woman looks after 8-10 eyes for 8 hours a day. The whole process is much faster and the pull and twist more even than filature silk comes out finer, more even and gets more yield from each cocoon. The women are paid Rs.35 per kg. of reeled silk. An average day's yield is about 250 grams so she gets about Rs.8.50 plus a dearness allowance of Rs.4 per day. While 'men' work as 'rerellers' where they merely connect reels to silk to a mechanically driven wheel on which silk is rereeled. They used to earn a piece rate equivalent to women but they had complained that they got less work than their capacity because women did not reel fast enough to keep them fully busy. So they made a successful trade union movement to get a daily rate of a gross Rs.16.75 per day. Now the reeler women are the worst paid in the factory.

The supervisors, batch-carriers and boiler attendants are all men and get a daily rate, ranging from Rs.16.50 to Rs.19.50 a day. (Banerjee, 1984, p.32).

### III. Decline in the occupational status of women workers

Due to the introduction to modern technology, women's involvement in the industry would slide down to a mere supporting role - helping the males in warp and weft preparation.

Among low income households such as the tasar weavers, women's earnings contribute significantly to family income. In fact, their total earnings, unlike those of their men who spend a part of their income on liquor and such other items, go down to meet the basic need - food - of the family. This underlies the importance of female earnings in these families and hence their crucial need for employment. While this could be a long run phenomenon, its immediate implication is the shortage of cocoons to the traditional reelers. This, in fact, has shown potential to make them vulnerable to under-employment (Moulik and Furusotham, 1986, pp.211-212).

The new technology per se is good and has potential in unleashing a number of benefits, it could improve the quality of the production, help to step up export trade and earn more foreign exchange, reduce the material waste and the workers fatigue. The new technology developed, instead of strengthening their self-employment status and in due course helping to improve their earnings, has begun to pose a potential threat to the very base of their employment. It has proved to have all potentialities to tilt their economic structural position to their disadvantage, it has found to be capable of engendering a specialised class in the industry, viz. commercial reelers with adequate resource

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position who are capable of acquiring strong economic hold over the function. This is evident from the women folk of the weaver families who eventually began to lose their jobs of cocoon cooking and thigh reeling per spinning to a few educated unemployed hands hired by a few resourceful individuals.

### III. FREE TRADE ZONES OR EXPORT PROCESSING ZONES

#### Women Workers in the Free Trade Zones and Export Processing Zones

The relevance of questions regarding the relationship between sophisticated machines and gender is no longer confined to established industrial nations such as the United States. Advanced technology has made possible the further integration of the world system of production and the transformation of manufacturing processes being carried out overseas. Therefore, it is necessary to explore the ways in which "refined technology" assigned by industrial powers is affecting employment opportunities and the quality of work life for women in developing nations. (Zimmerman, 1983, p.18)

One of the consequences of modern technological development has been the incorporation of vast numbers of women from developing countries into "Export Processing Zones (EPZs)"<sup>1</sup> and "Free Trade Zones" (FTZ)<sup>2</sup> where electrical and electronics goods are assembled. (Zimmerman, 1983, P.18) and the textiles and garment-export industry (Chapkis and Enloe, 1982, P.1)

#### 1. Export Processing Zones (EPZs) - (as described by the Ministry

of Economic Affairs in Taiwan) 'the EPZ is a combination of a free trade zone and an industrial park, designed to promote export-oriented industries'. All products manufactured in an EPZ must be exported. The vast majority of workers in EPZ's tend to be women and most are under the age of 24.

2. Free Trade Zones (FTZ) - Sometimes known as an "industrial estate", a FTZ is a physically fenced-in area developed by the host government to facilitate the operations of export oriented business. Products made in a FTZ must be exported. The manufacturing concerns within the zones are offered preferential treatment such as exemption from taxes, low rents, repatriation of profits and assistance from the zone authority in recruiting labour. The first FTZ in Asia was set up by the Taiwanese in 1965.

This process has been encouraged by government in both the developing and developed countries. Governments of most third world countries have played an active role. Many have set up "FTZ or EPZ" to attract the "off-shore" assembly operations of multinational corporations" <sup>3</sup> (Gothoskar, 1986, P.1489). According to figures collected by the United Nations Industrial Development Organisation, there are at present approximately 120 EPZs in developing countries. (UN Working paper, 1980).

This 'new international division of labour' divides up technical know-how and skills (Gothoskar, op.cit, p.1489). The world is rapidly moving toward a highly centralised arrangement in which advanced industrial nations retain control over research and development, technological expertise, decisions affecting production, and the distribution of financial outflow. Simultaneously, developing countries have become the source of cheap labour for the manufacture of exportable goods, many of which are electrical and electronic gadgets. (Zimmerman, op.cit.p.19). Thus all the know-how and control remains completely outside the third world. (Gothoskar, op.cit.p.1490).

#### The Global Assembly Line

The control of this entire phase of development of the 'global assembly line' suggests a relationship of imperialistic power and control- concentration of economic

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3. Multinational corporation - Also known as a "transnational corporation", it is a large, privately owned business enterprise operating across national boundaries.

and political power in the hands of ruling groups in a few countries. These groups police the world, trying to make it safe for profits. They have often recruited ruling groups in subordinate countries to assist in this task.

Besides, many governments in the third world find this arrangement beneficial to their immediate concern for stability and control. The host governments can count on receiving 'aid' and loans from International agencies, on which most of them heavily depend, as well as economic and military assistance from the United States and other Western countries, also to repress the workers and "keep their girls as docile as they appear in the brochures".

In fact, the 'third world' countries seem to gain very little from this entire process and pattern of industrialised development from the FTZ. The host countries have had to spend enormous amounts of resources and foreign capital investment in providing infrastructural facilities and incentives. The share of export earnings in the total exports is also fairly small. (Gothoskar, Ibid, P.1490)

#### Why employ women workers?

One important argument in favour of the FTZ has been the employment opportunity. The factories in these zones preferentially hire young, unmarried and inexperienced women for the unskilled or low skilled work which comprises most of the jobs. (Zimmerman, op.cit., P.21, UN Report, 1984 P.4; chapkis and Enloe, 1982, pp.1-2, Gothoskar, op.cit, p.1490, Patel 1985, P.8) Banerjee, 1984, p.53). In practice, however, they

have generated not more than 1.5 million jobs all over the world (Gothoskar, op.cit).

The reasons the management and administrative authorities of the FTZ or EPZ gives for employing such large proportions of women are -

1. Women are not technically minded - Women it is often argued, just don't have that natural affinity with machines that men have. They can operate simple machines - but they cannot understand how the machine works. Even routine machines maintenance is beyond the capacity of women (Chapkis and Enloe, 1982, p.7).

2. Women naturally have nimble fingers - Oriental girls are employed by the transnational corporations because for them Asian Women Workers are "docile, nimble, fingered and more efficient than men" (Patel, 1986, P.6). Women have special qualities of patience and capable to do repetitive jobs (UN Report, op.cit, P.4) Gothoskar, op.cit, .p.1491). Women are hired to perform the tedious and unrewarding operations that accompany assembly work for reasons that are political and economic, not psychological or unatomatical (Zimmerman, op.cit. P.21).

3. Women do not need to earn as much as men - In most of the cases, women get less wages as compared to men. (Patel, op.cit. p.6; UN Report, 1984, p.4) managers believe women to be 'supplementary' wage earners whose main responsibilities are in the home, they do not encourage permanence on the job (Zimmerman, op.cit, p.24; Gothoskar, op.cit.p.1491; Chapkis and Enloe, op.cit, pp 7-8).

4. Women are docile - Employers explain that they prefer to hire 'girls' because they are easy to control, cooperative, patient, prepared to sacrifice and work for longer hours. Girls have the inborn qualities of sincerity in doing whatever they are told to do, thus output is higher. (Chapkis and Enloe, op.cit.p.9; UN. Report, op.cit, p.4; Gothoskar, op.cit. p.1491; Zimmerman, op.cit, pp.21-22).

5. Women in the Third World are 'cheap labour' - 'Cheap labour' is a euphemism for women's labour. The term 'cheap labour' often carries with it undertones of condemnation of the workers themselves. There is something of an implication that workers who are 'cheap labour' must be lacking in self-respect. Tighter control, they believe, will preserve their jobs. (Chapkis and Enloe, op.cit).

6. Women can be easily replaced - Another advantage of female employees for FTZ or EPZ is their easy replacement. Firms prefer to hire new personnel than to incur the responsibilities that a long-standing workforce might demand. (Zimmerman, op.cit. p.25).

#### Nature of women-worker's Employment in the FTZ or EPZ

The International Development Strategy for the Third United Nations Development Decade stresses that :  
"Industrialization policies should have as one of their aims productive employment generation and equal participation of women in industrial development programmes". (Paragraph 77)

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In the newly industrialized areas of developing countries, women are entering the work force for the first time in massive and growing numbers. A 1983 ILO Study on EPZ in Asia estimates that 5,00,000 workers are directly employed in the industrial zones. (UN Report, 1984, p.1)

Even if women's numbers in the labour force are growing, can we speak about "equal" participation? Therefore, it is essential to examine the nature of employment, i.e., the types of the jobs women do in the FTZ or EPZ.

(1) - The jobs created in these zones are usually unstable, laborious and manual and are termed as unskilled or semi-skilled. Unskilled labour is typically performed by the young females under the bad working conditions. (Gothoskar, 1986, p.1491; Rao and Hussain, 1984, p.11; Zimmerman, 1983, p.26; Banerjee, 1984, p.57).

(2) - Women have a double role in these industries, they allow production to be flexible by not requiring expensive specialised machinery and by not protesting at frequent closures and lockouts when demand falls. And they make it even more profitable by accepting low rates. (Banerjee, 1984, p.57).

(3) - Women are supposed to be given only those tasks where she does not need mental concentration or where tools can be put down quietly and work can be stopped, started again and again without any effects on production. (Banerjee, 1984, p.56).

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Because of their behaviour, expectations, and attitudes (which are the result of socialisation processes in which gender plays an important part); because of their comparative youth, and because of their subordinate position in their own households, these women constitute a highly vulnerable, docile and manipulatable workforce. Their employment in low-paying unskilled and semi-skilled jobs offers distinct advantages from industry's point of view. (Zimmerman, 1983, p.22) Nobody finds anything objectionable in this as the value of women's work is defined by an 'ideology' which circumscribe their role in the family and by 'male definition of femininity'. (Gothoskar, 1986, p.1491).

#### Obstacles to women's in FTZ or EPZ

Although women constitute a major proportion of workers in the FTZ or EPZ but there are several obstacles that prevent their fuller participation in the industry. These are -

##### a) Discrimination -

In the electronics industry, most of us (women) are assemblers, while most men are technicians, supervisors and managers - It is because men are usually provided with more opportunities of education and training, and women have little choice of jobs, not only due to lack of training, but also because of traditional perceptions that women's place is at home.

(The plight of Asian Workers in Electronics, 1982, p.30-31)

"They prefer men because women have to be given leave for delivery and paid maternity benefit - They do take unmarried women but they prefer women who have had a (sterilization) operation."

(Woman Textile Worker in India, quoted in of common cloth, 1983, p.43)

Discrimination against women workers, both blatant and hidden, is universal. Even where it is prohibited by law, it continues due to tradition, custom or deep-rooted perceptions and attitudes towards women. It is found in both the most highly industrialized countries and in the least developed ones and in all types of economics. (UN Report, 1984, p.10).

While the types of discrimination are interlocking, some of the main areas of discrimination are :

- Hiring and employment practices - There is highly discriminatory employment policies which favour very young, single and childless women between 17 and 25 years of age, with a minimum level of schooling of 6 years and a maximum of ten. After 25, a women may be superannuated, i.e., too old to be employed in stable electronics manufacturing firms. If she has youngsters to support and/or is married, her possibilities for work in this sector diminish even more substantially. Women need jobs to support their children, but they are often turned down because they are mothers. (Zimmerman, 1983, p.26).

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Most women workers are found in the lowest paid, lowest status and lowest skilled jobs with little opportunity for advancement. They have the least job security and fewest benefits. In some places, certain women suffer even more because of apartheid, racism, ethnocentrism or the caste system.

- Wages - Women everywhere are paid less than men because they are hired for the lowest types of jobs, they are paid less for doing the same jobs as men, and because the jobs they do are valued less, even though they may be as more demanding than the jobs men do.

(UN Report, 1984, p.11).

- Legislation - Women are still not adequately protected by maternity legislation. Protective legislation has also been used against women by preventing them from undertaking the more economically rewarding jobs. (UN Report, 1984, p.11 ).

- Education and Training - Because women receive less education than men, fewer job opportunities are open to them. Vocational training and access to new technology and knowledge is given almost exclusively to men and providing women only with programmes for developing domestic skills. (UN Report, 1984, p.11; Zimmerman, op.cit, p.27).

II. Occupational health and safety - The second major obstacle to women's participation in the FTZ or EPZ is the phenomenon of health and safety hazards.

"The whole room fills with dust and it is hard to breathe. Since we have been working in such dusty air, there have been increasing number of people getting tuberculosis, bronchitis and eye diseases." (Ehrenreich and Fuentes, 1981, p.57).

In 1975, just three years after the first electronics plant opened in Penang, nearly half the workers there complained of deteriorating eyesight and frequent headaches - the result of microscope work. (Rachael Grossman, "Women's place in the Integrated Circuit"..,1979, p.11)

When a woman is pregnant the health hazards to which she is exposed are a threat to her child as well as to herself---she must have a clause in her contract that protects her right to transfer to a safer part of the plant without loss of pay or seniority --- No woman should ever have to choose between her job security and her baby's health.

(Quoted in "Occupational Health-Part II",1976).

Occupational health and safety hazards are a particular threat to women workers because women are so often employed in industries, such as textiles and electronics, with a high level of hazards; in monotonous, repetitive, low level jobs with poor working conditions. Women workers are doubly at risk because they work a double day and because the health of their unborn children may also be affected. This may lead to chronic ill health. Sometimes a woman's health may deteriorate to the point where she can no longer perform her job well or even continue working. (UN Report, 1984, p.16).

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**TABLE XIV**

**OCCUPATIONAL HEALTH AND SAFETY HAZARDS TO WHICH WOMEN  
MAY BE EXPOSED INCLUDE :**

<b><u>Hazard</u></b>	<b><u>Possible effects</u></b>	<b><u>Where it may be found</u></b>
Textile and Sillica dust	Respiratory infections, lung disease, eye infections.	Textile and electronics industry
Toxic fumes	Headache, dizziness, nausea, eye, nose, throat, lung irritation; rashes, cancer, birth defects, miscarriages.	Electronics and Other industries using chemical processes.
Prolonged close work e.g. with microscopes	Eyestrain, conjunctivitis, deteriorating eyesight.	Electronics, watch and other assembly plants.
Rapid, repetitive movement of small pieces	Tenosynovitis or swelling of tendons in arms and wrists.	In jobs typically hiring women for their nimble fingers.
Noise	Temporary or permanent deafness	Textile and other industries using noisy machines.
Machine accidents	Physical Injury	Especially garment sewing industry, particularly during speed ups.
Fatigue	Exhaustion, physical and nervous break-down, susceptibility to illness	Revolving shift-work everywhere that women work a double day.

Source: UN Report, 1984, p.17

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The most horrifying side of working in the FTZ is health hazards at the work place. Forced overtime, nightwork and high production quotas create mental and physical distress among the workers. Women are supposed to soak between 12,000 to 22,000 integrated circuits into pots of chemicals everyday. Chemical hazards in electronic industries are highest. Women have to soak integrated circuit, semi-conductors (microscopic) electronic circuits into chemical solutions to rustproof and strengthen them; dip the silicon chips into toxic acids and have to continuously peer through microscope. There is no proper ventilation in the electronic industries. All these give risk to health problems among women workers. Presence of poisonous gases and toxic chemicals result into miscarriage of pregnant women and also cause cancer. Employers also neglect safety precautions. (Patel, 1984, p.9).

Says Vimal Balasubrahmanyam while reporting about the garments, electronics, asbestos, soldering and other units in FTZs "stress induced illness" has emerged as a major hazard for women assembly line workers because the work is repetitive, tedious and exacting and because high production quotas are imposed. (Balasubrahmanyam, 1984, p.1190).

III Sexual harassment on the job - Another major obstacle to the women's employment is the sexual harassment on the job.

If an attractive female workers cannot keep up with her production quota in the factory she is told, 'Either you lie down, or you will be laid off'. The majority of girls exploited in this manner are supporting younger brother and sisters and they keep quiet for fear of losing their jobs. (Wynee, 1979, p.47).

Women workers in the FTZ or EPZ : The case of 'India'.

In India also FTZ or EPZ are created with an aim to achieve export oriented industrialization 'that would help the process of achieving economic independence from the Western countries' whether they really contribute to this process is really doubtful (Patel,1984,p.8). The industries under the FTZ in India are electronics, garment export, asbestos and soldering. It is, therefore, essential to examine the work condition of women workers in these FTZs or EPZs.

Electronics Industry under the EPZ : Women workers in Bombay EPZ - The main electronics industries in the EPZ are located in Bombay. The Santacruz Electronics Export Processing Zone (SEEPZ), is a multi-national company where women constitute about 91% of the total workforce. Just about 3 bus stops away from SEEPZ is a large scale electronic factory, where about 20% are women workers. Also, close to SEEPZ is a huge factory, a multinational, Larsen and Toubro, with a workforce of over 10,000 with about 1 per cent of its workforce being female.

Position of women workers in the EPZ -

1) Age of women workers - Like other EPZs in other third world countries, in Bombay too, more than 70 per cent of the women are unmarried and about 99 per cent of the women are unmarried when they joined. The majority of the women are between the ages 18 and 27.

ii) Educational qualification - The minimum qualification for

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a job at SEEPZ is 10th Standard, i.e. completion of schooling. But, some of the earliest recruits have not completed schooling while a few have studied one or two years of college as well.

iii) Family background of the workers - Most of the women come from lower middle class or working class background, about 15% are the sole bread-winners in the family, about 50% have just another bread-winner.

iv) Nature of Employment - The majority of women work as 'unskilled or semi-skilled' workers such as machine or assembly operators doing work like striping, crimping, soldering, writing, testing etc. Some of these like soldering or striping are manual jobs, done by hands, others are done by machines, while men work as supervisors, engineers, scientists, maintenance and security personnel.

v) Working conditions -

a) Temporary jobs - Most of the women workers are not even given a permanency letter after years of working here. The people at Saroj Electronics, told that they were 'permanent'. But no sooner had they formed a union, they were all thrown out.

b) Wages - One women worker told that when she was recruited in 1979, she used to get Rs.150 per month for six months. This was supposed to be for "training". Out of this Rs.150, the Government pays Rs.100 and the company has to shell out only Rs.50. Even after six months training, the workers get Rs.175 per month for another six months.

After a year, Rs.225 most factories have Rs.25 increment in a

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year. Some factories have house rent advance of about Rs.50-75 per month and shift allowance of Rs.3 per day.

Thus, more than 50% of the workers receive merely Rs.500 or less. The Government has not announced the minimum wages for electronics till January 1986 despite the fact that SEEPZ has been in existence since mid-1970.

c) Shift Timings - Another very important problem that the SEEPZ women workers face is that of 'shift timings'. women are allowed to work in SEEPZ in two shifts from 6 a.m. to 2 p.m. and from 2 p.m. to 10 p.m.

"Some of us live so far from SEEPZ that we have to start to work at 4.30 a.m. in the first shift and do not yet back till nearly midnight when we are in the second shift. It is so unsafe especially the walk from the station to home".

The factory inspector had issued a notice that all shifts for women should end at 7.30 p.m. But the management has done nothing to implement this notice.

d) Health Hazards - The women had a great deal to say about the effects of their work on their health too. The most common problems were severe eye and back strain, constant headache, and a general feeling of weakness and ill-health.

"Sitting on these chairs continuously is tiring and uncomfortable. But during our menstrual periods, it is very painful as well my head feels really bad then".

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When I was pregnant, I used to feel dizzy sitting here for several hours continuously. If I wanted to relax and stretch myself for a few minutes, the management would take objections to it. There should be atleast some decent rest room.

Thus, there seems to be a need to challenge the very existence of FTZ or EPZ, as these symbolise the imposition of a model of economic and industrial development beneficial only to the multinational corporations and their governments, at the expense of the women workers in the Third World.

IV MICRO -ELECTRONICS INDUSTRY ( AUTOMATION )

Any technological change brings in its wake dislocations and readjustment. The change may be painful, but not to change may be fatal in the long run, particularly in the context of speedy change and fierce competition going on all over the world. Science and technology offer the greatest opportunity to us to reshape her destinies and take a leap forward.

Advance computers, optical scanners, robots, flexible manufacturing system, computer-aided design and computer assisted manufacturing and other forms of sophisticated automation system are contributing a great deal to increasing efficiency, productivity, leisure and standard of living. (Goel, 1985, P.9).

Jobs can be expected to change in character as a necessary adaption to the new technology, and over time it is clear that many jobs will disappear while other new ones emerge. Nowhere is this becoming more evident than in office work where developments in micro-electronics technology during the last decade have created a whole new generation of office equipment which analysts have predicted will change skill requirements and lead to job less among clerical and administrative staff. If these predictions are realised, women will be the group most affected as they are concentrated in those sectors and occupations which will most likely be changed by the increasing application of new technology to office work. (Werneke, 1983, p.1).

### The technology

Micro-electronics comes under the broader umbrella of semi-conductor technology. Semiconductor technology is used to manufacture integrated circuits (Ic), which contain many inter-connected transistors placed on small semiconductor "chips" of silicon each only a few millimetres square. Integrated circuits are referred to collectively as "Microcircuits", and the technology which involves their use is referred to as "micro-electronics" (UN Report, 1980, p.4).

The field of microelectronics includes such devices and automation procedures as computers, word processors, integration of data processing in telecommunications and industrial robots. (Ibid, p.2). One of the most significant features of microelectronics technology is that it enhances computer technology. The reduction in cost and size, combined with increases performance and reliability, make the application of 'Microprocessors' feasible in a whole series of uses beyond those associated with 'traditional' computerization. The microprocessors is the current high point of microelectronics. In conjunction with the equally impressive quantum leaps being made in satellite and telecommunication technology, it can be considered as the core of "the new technology". (Ibid, p.4)

Impact on women's employment opportunities -

During the last two decades women have entered the labour market in increasing numbers, accelerating a trend evident in most countries since the Second World War. (ILO Report, 1981, pp.4-6). The majority of women have found employment in the tertiary sector of the economy and in non-manual occupations. (OECD, 1981; ILO, 1977-79). Indeed as women have entered the labour market, certain activities in the service sector and occupations have become increasingly 'feminised'. Today, throughout the industrialised countries, one of the fundamental characteristics of the labour markets is the market segregation by sex. Women are concentrated in a limited range of occupations and are most likely to be found working in relatively less skilled and lower paying jobs than their male counterparts. This concentration has important implications for where the incidence of adjustment to new technology will fall. This is because many of the occupations to which women gravitate are those which the new information technology is beginning to transform. (UN Report, 1980, pp.18-19; Werneke, 1983, p.28)

The Female Labour Market - likely to be disproportionately affected - Women workers are the ones to bear the brunt of the impact. Female employment is referred to as a problem.

In the absence of full employment, however, rapid and thoughtless technological change can only exacerbate social problems, especially through the displacement of workers - particularly minorities and women who are just beginning to achieve job levels which permit them to enjoy the benefits of technology. (Donahue, 1984 )

There does seem to be some agreement on job destruction in specific segments of the labour market: these are thought to be more severe for older workers who have less flexibility in retraining, re-education and relocation and for the lower level, skilled labour force. Among managers, the middle management is expected to be hardest hit. But overall, it is women, who form the bulk of information manipulators in the service sector, who are expected to bear the brunt of the impact.

(OECD, 1981 )

The information sector, like the rest of the economy is not homogenous. Within it there are skilled occupations - those who create, analyse, coordinate and interpret information - and less skilled - those who manipulate information. (Porat, 1977, p.106). The latter's tasks may be characterised as information handling. It is in these activities that women by and large are concentrated as Secretaries, Typist, Bookkeepers, Stenographers, Cashiers and the like. (Weineke, 1983, p.29). Solby Smith has called them as "female" occupation (where 50 per cent or more workers engaged in that occupation are women. (Smith, 1979). In contrast, the upper echelons of information occupations are dominated by men who are the vast majority of senior and middle management and professional workers. Mic-ro-electronics is fundamentally conceived of as a tool to assist the latter group in their decision-making, analysis and communication by speeding up and broadening the flow of information to and from them. The use of mic-ro-electronics, as far as the information handlers are concerned, is a tool to increase their productivity in delivery of that information and consequently has significant employment implications. (Weineke, 1983, p.29,31).

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Selby Smith in his study found that a greater number of "male" than "female" occupations will feel a significant impact from microelectronics. However, because the male work force is so widely distributed across a comparatively large number of categories, this results in a considerably smaller proportion of active men working in "at risk" occupations. (op.cit.1979)

Large number of women are working in information handling occupations and may therefore bear the burden of adjustments that are required. Moreover, it is not just those women who are now employed that will be affected. These occupations have been of key importance for providing women with work. This may cause problems among women who are seeking to re-enter the workforce after a spell in domestic activity and among few entrants hoping to follow in the tradition of the women before them. (Werneke, 1983, p.33; UN Report, 1980, p.22).

The use of micro-electronics technology in the office will result in some labour displacement. Some women may lose jobs and the use of new technology is likely to cause a curtailment of growth of the office jobs generally held by women. And because of certain factors affecting women workers one can postulate that adjustment to change may be quite difficult in some cases. For one thing, if existing jobs are lost, women generally have more limited access to alternative jobs possibilities than men because of their domestic/ family responsibilities. They may be limited by the geographical area to which they are confined or by time constraints which might preclude taking a new job some miles away.

Most women withdraw from the labour force for some period of their adult years to have children and raise a family. This may make re-entry to the labour market particularly difficult in times of spreading technological change. Many of their traditional skills such as speed typing and shorthand may be outdated as firms search for personnel who are acquainted with word processing and other new technology-based office equipment. (Werneke, 1983, p.33)

### New Jobs

Where growth is possible in the economy, new jobs appear. Some of the most important areas where jobs will expand are those connected with new computer-based automation equipment itself. There are a relatively wide variety of jobs that are seen as possible openings for women but these openings are more 'mirage' than oasis. (Benston, 1983, p.48).

In one category, there are jobs running the new automated equipment for increasing productivity. These are mostly replacements of existing jobs, are typically women's jobs and will remain open to them. Operation of computer themselves belongs to this category. But the usual barriers limit women's entry into jobs seen as involving a high technical mastery of machines.

Second, there will be a wide variety of jobs involved in the development, maintenance, and use of computer programmes (software) and databases. There are often referred to as the "large number of new jobs

being created by the new technology". But there appears to be little opportunity for displaced women to obtain these jobs, which go mainly to technically trained, male workers. The training required is often inaccessible to women in general and to working women in particular. The reasons for this involve the financial burden of training, outright discrimination, and not least, the socialization and channeling that convinces women they are not capable of jobs that are perceived to be highly technical.

Since people will be required to repair and maintain the new equipment, this is the third place where jobs will increase. At present, and even more so than in software, these jobs are held by men. Almost no women have access to the technical training required.

There are a number of other areas that will open up: selling computer equipment and software and educating and training others in the new technology. Women may find sales jobs difficult to get, particularly if they have a high technical component, but at least some of the educational areas may prove to be relatively open. (Ibid, pp.48-49).

Women have not much benefitted from these new jobs. Those who can must strive for entry into jobs now reserved for men simply as a survival tactic.

#### Impact on work environment

The use of computers and data systems have also led to new work environment problems. While physical work environment risks have been reduced, the result has sometimes meant increased mental stress and anxiety. One example is the

increased individual work which is part of new supervisory tasks, leaving people isolated for hours at a time in a control room. Another example is computer terminal work which can be mentally stressful with monotony in some cases and demands for continuous alertness in others. ( UN Report, 1980, p.25).

The UN Report also states that the new technology may not only lead to new mental strains, but may also create 'physical health risks' -

- a) chronic back pains and permanent injury resulting from long unrelieved periods of sitting as a machine, frequently in an incorrectly designed chair. (Ibid, p.25; Werneke, 1983, p.37).
- b) painful swelling of the hands and wrists, caused by quick, repetitive hand and arm movements over a long period of time, such as are needed for key punch operations on data entry keyboards. (Ibid, p.25)
- c) headaches, eye strain and permanent eye damage caused by use of video display units. (Ibid, p.26; op.cit.p.37)
- d) headaches and partial hearing loss resulting from the increased noise level from electronic machine in open space offices. (Ibid, p.26)

It is also necessary to examine the impact of automation on the women's employment opportunities in Indian context.

Union Research Group, Bombay has done an indepth study of impact of automation on women's employment and working condition in twenty 'big' pharmaceutical and two

'big' biscuit and confectionary making companies. In their study they have concentrated on packing lines in the Biscuit and Confectionary Industry and pharmaceutical lines because in the last couple of years, there has been a great degree of automation on the packing lines and in this section a large number of women are employed. Their study shows that -

I) The Automation has treated such a situation that one sees two processes occurring simultaneously. Workforce reduction on the one hand and increasing work-load, work-intensity on the other. Over work for some and unemployment for the rest.

II) Automation has helped managements to cut down women's employment. The arguments justifying chucking out of women workers at the time of automation are "women only work for pin money, they are not serious about their jobs". "The new machines have to be used on a shift basis, and women can't work shifts", "women are absent every time someone in the family is ill, they have to be paid maternity benefit and provided with a creche".

What were the responses of women workers interviewed by Union Research Group? Women workers said "it is a myth that we work for pin-money. Our wages make vital contribution to family's welfare. Many of us have been in the industry for more than 15-20 years and have no thought of leaving until retirement."

Because of sexual harassment and family responsibilities women workers find it difficult to work in the night duty.

About absenteeism among women, they had to say that what is about absenteeism among male workers due to arduous alcoholism? Whenever the managements want arduous labour for women, it is all out for employment of more and more women.

III. The survey also highlighted the main problem of automation like increase in workload due to pace of work, bad design or irrational organisation of machinery, survival of fatiguing or strenuous manual operations in those sections where automation has not taken place and floating staff and work-force reduction.

IV. The survey also showed that increased work intensity as a result of automation caused health problems like muscle fatigue, mental exhaustion etc.

In short, URG's survey shows that in the existing economic order where profit earning is the central aim for production automation means job-loss, fatigue, tension, surplus staff and premature retirement. And women workers become the first target of all these. (Union Research Group, 1983, 1984).

Additional problems for women -

If women are disproportionately adversely affected by the new technology, it is also essential to analyse the role of socio-cultural factors behind this position.

The major difficulty derives from the basis of occupational segregation; women have been confined to a limited range of occupations, and are left with rather narrow prospects for employment. Moreover, as women

at least older women - often lack extended formal education, they may have greater difficulties in readjusting to new jobs. The technical interest and skills associated with some of the new jobs created may discourage women from applying for them.

Second, because of their child care responsibilities, many married women still have disrupted working careers. Thus, they have not experienced the same benefits from a broad one on the job training and job socialisation as the male workers.

Third, women's greater family responsibilities obviously make them less geographically mobile in the labour market, thus restricting their employment opportunities.

Finally, women are in a comparatively weak position to bargain for their share in the gains from technological change.

Moreover, in times of depressed economic activity, women can become scapegoats for a high level of unemployment. Unemployment, with heightened competition among workers for jobs, has historically tended to act against the right of women, particularly married women, to paid employment. (UN Report, 1980, p.23; Werneke, 1983, pp.33-35)

#### Automation for what and for whom ?

Automation increases the possibility of a future with a much lower level of drudgery, where boring and dangerous jobs are done by machine. On the other hand, it also brings in the sharp focus the problems of the

present. In a society where being a full citizen is equated with having a job, what happens when there are not enough jobs for everyone? Women, as housewives, have borne the stigma of being unwaged workers in a wage-based society. As women, and men, are forced out of the labour market, will there be an institutionalized division between "the producers" with jobs and "the drones" without, as predicted as long ago as the 1920s by novelist Frederick Grove. (Benston, 1983, p.53).

The ILO study, however, holds that very often the basic technology, is not at fault - what is usually wrong is its application, work organisation, or management policy. In other words, many of the negative side-effects of new technology, is man-made. So the challenge to management and labour is to mitigate them as much as possible through concerted efforts (ILO, 1985).

CONCLUSION

The initial adverse impact of more sophisticated technology in Industry on the employment of women has been a global trend. Technological innovations in industry not only reduce the rate of absorption of new labour but also involve the displacement of women workers from previously held occupations to lower productivity and low wage occupations. Recruitment pattern in some of the industries is also 'gender' specific. Some of the new industries (Free Trade Zones) tend to recruit only unmarried young girls for unskilled occupations. Technological innovations also led to wage differential among women and men workers on the basis that women are generally less skilled than men. Women workers are mostly engaged in lower level, lower skilled occupations in most of the industries and hazardous chemical substances are being used which causes a number of health hazards among women workers. Technological innovations also tend to increase in work burden of women and has a detrimental impact on the women's power and authority situation. Technological innovations has led to increase prosperity among certain sections of the society. Therefore, as soon as family income increases, women workers tend to be withdrawn from the labour market. Also increase prosperity has led to increase in dowry practices among these communities. Thus, technological innovations has resulted in marginalisation, pauperisation and housewification of women workers.

## Chapter II

### Eugenics Technology and the Status of Women

Ill health cannot be seen in isolation from political, social and economic forces operating in the country. India with its history of colonial rule, has inherited and continues to maintain and uphold a system which is profit-oriented resulting in exploitation and denial of justice to a large majority. A person's health is seen only in the context of the extraction of labour for profit. The commercialisation of medicine and the operation of the predominantly multinational drug industry aggravates the situation. Health services are therefore, to be seen as a part and parcel of the total emancipation of human beings. (Gnandason, 1986, P-1630).

Do women have separate health problems that demand a new perspective on women's health and reproduction? So far, women's health needs have been seen as a part and parcel of maternal and child health. Hence, all health care facilities view women as mothers, but not as persons in their own right - women's conjugal and reproductive duties comes first. (Patel, 1987, P.26). The Indian woman is doubly oppressed in the context, reducing into a machine for producing and reproducing labour power, her humanity and personality is denied and suppressed.

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(Gnanadason, Opcit). Further, patriarchal relations in the medical profession provide a parallel to the 'father, mother and child' relationship - the 'doctor, nurse and patient' relationship, in which the father or doctor is supposed to be benevolent, benign and at times strict (Patel, Opcit).

Technology has the power to alter radically the nature of reproduction. If technology in general expresses and views and aspirations of the people who create and use it, the New Reproductive Technology (NTR), in particular highlights one of our most cherished beliefs - that just about anything we want today, including life itself, lies waiting for us on a Supermarket itself.

Technology is so reserved for its promise of instant happiness that the most basic questions we need to ask often remain submerged below our dreams of comfort and prosperity. But considering the vast sums of money invested in technology and the extent to which it shapes our lives, we need to reflect a great deal on the ideals and objectives which give it direction (Ranganathan and Bahl, 1986, p.1).

NTR refers to the range of technology related to reproduction, from fetal monitoring<sup>to</sup> amniocentesis

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test tube babies, frozen embryos, sperm banks, surrogate mothers, gene therapy, sex selection. May be soon also cloning and even the artificial uterus, the development of a child outside a woman's body.

(Stern, German Magazine, 1980, pp 63-65, 151-152).

These methods, promoted for their ability to provide more information related to child bearing, and consequently as methods essential for safe childbirth, are seen to be not just a boon, but in certain cases, a miracle (Ranganathan and Bahl, Op.cit).

Do these new technologies really give women more freedom to decide how, when and if they want to be biological mothers? Do all these antenatal tests performed on the developing embryo and foetus actually help them to produce 'healthy' children? Or are women faced with a technological progress which increases technological control over people's lives and specifically further limits the freedom of women? Are women becoming 'mother machines': reduced vessels, living laboratories which are chopped up in pieces - from one woman the egg, from another the uterus? Could these new technologies lead to an exploitation of women as childbearers on a really large scale?

A. Sex-Determination Technique (Amniocentesis):-

A Sanskrit verse on the birth of a daughter summarises why people do not want a baby girl.

"At birth she brings a burden of sorrow,

In youth anxiety for her good name,

At the time of marriage deprivation of wealth,

She tears at the heart, indeed, her father's heart".

(Sanders, 1986, p.1)

R.P. Ravindra in his study found that universal discrimination against women in male-dominated society has different manifestations in different parts of the world. In our South Asian region it is the obsessive male preference which results in misery and death of female infants by neglect of actual intention." (Ravindra, 1986). In many parts of the country, a woman is still considered a burdensome appendage. She is an economic drain. -She must be exploited or dispensed with as a non-person. Because she crushes her family with marriage and dowry expenses. She must be raised - from childhood - in financial and physical neglect. Her birth in many parts of the country is greeted with silence, even sorrow. A boy arrives to the sound of joyous conch shells. Discrimination begins at birth.

India is the only country in the world where the ratio of men to women has been declining over the years - the sex ratio declined from 972 females/1000 males in 1901 to 935 in 1981. The female mortality rate is 60 per cent higher than that of males amongst children

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under nine - and this despite the fact the female child is biologically stronger at birth (Sanders, Op.cit).

The female child in India is considered a liability in every way. Thus, even before she is born, efforts are made to eliminate her. Modern science is now being 'misused' to prevent her birth and ensure the conception of a male (Darshini, 1986, p.1). Science and technology are 'not neutral' is content. That they are determined by the prevailing social structure is clearly demonstrated by the sex determination and sex preselection techniques. (Gupte, 1986).

Various technique of sex-determination and sex-preselection have been discovered during the last fifteen years!<sup>1</sup> (Kolater 1983). Techniques such as sonography, fetoscopy, Needling, Chorion, Biopsy, Ultra Sound Scanning and the most popular one - Amniocentesis are increasingly becoming household names in India (Ravindra, 1986), combined with population control policies and the strengthening of patriarchal institution and attitude of male domination (Mies, 1986 ,P.151)

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1. Sex determination is but one method of getting rid of the female foetus, others being CUB, Ericsson and Japanese method of preselection, B.N. Purandare's method of Rudraksha and Podar Medical College's Ayurvedic nasal drop technique.

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Amniocentesis - An Abuse of Advanced Scientific Technique

Amniocentesis, a technique originally designed to detect foetal defects, but grossly misused to detect foetal sex and thereby for female foeticide has raised considerable storm in India. (Gupte, Op-cit).

Though Bombay and Delhi are the major centres for sex-determination and sex-preselection tests, techniques of amniocentesis is used even in the clinics of small towns and cities of Gujarat, Maharashtra, Uttar Pradesh, Bihar, Madhya Pradesh, Punjab, Tamil Nadu and Rajasthan. Justification of these techniques is aptly put by team of doctors of Harkisandas Nurrotundas Hospital (pioneer in this trade) in these words:-

"-----in developing countries like India, as the parents are encouraged to limit their family to two offsprings, they will have a right to quality in these two as far as can be assured. Amniocentesis provides help in this direction". (S. Panthaki, Bangkar, Kulkarni, Patil, 1979).

Technical Details of Amniocentesis -

For detection of the sex of a foetus, 15-20 ml. of amniotic fluid is taken from the womb by pricking foetus membrane with the help of a special kind of needle. After separating foetus cell from the amniotic fluid, (Patel, 1986 pp 1-2), this is cultured for chromosomal analysis and results are available in about six weeks (Mishra, 1986, p.1).

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This test may disclose genetic or chromosomal disorders like mongolism, retarded muscular growth "RH" incompatibility, haemophilia, inborn errors of metabolism and neural tube defects and is indicated in situations of:-

- 1) advanced maternal age;
- 2) a previous pregnancy that resulted in the birth of a chromosomally abnormal child;
- 3) a parent known to have or to carry a chromosomal abnormality;
- 4) a history of three or more spontaneous abortions, particularly if they occur early in the pregnancies or were known to be associated with a chromosomal disorder; or
- 5) previous children (usually deceased) with multiple mal-formations on whom chromosomal analyses were not done. (Patel, Op.cit, p2; Mishra, Op-cit, Pp 1-2; Rai, 1986, p.8).

#### Limitations of Amniocentesis

This test can give 95-97% accurate results. (Patel, Op.cit, p.2). In spite of all precautions, the procedures can be fraught with danger of abortion in 0.1% of cases only. (Kishwar and Vanita, 1985, p.208), Thus it is not totally reliable. In Harkisandas Hospital and Pearl Centre, Bombay where this test is conducted on thousand of women, it was noted that the test had affected foetus adversely to 1% of the total number of cases. Thus the test may lead to spontaneous abortions or premature delivery, dislocation of the hips,

respiratory complications, needle puncture marks on the body. (Chhachhi and Satyamala, 1983).

The test is conducted only in the second trimester or after 16 weeks of pregnancy. (Patel Op.cit, p-2; Rai, 1986, p-8; Sadasivam, 1986,p.39). For accurate results, the testing has to be spread thereafter over 6 weeks. This means the woman is in her 24th week of pregnancy and the abortion is done at considerable risk to her life. An abortion after the 20th week of pregnancy is also illegal. (Rai, Ibid). In our country, the facility of amniocentesis is available only in the cities and towns. Hence patients from villages and small towns get the results by post; that takes some time. By the time they decide to abort the foetus, it is over 18 weeks of pregnancy. Abortion at such a later stage is quite harmful for the mother. (Patel, Ibid).

Unscrupulous doctors are even known to have done abortions without doing the amino cells culture test in weekly intervals over the prescribed period. To avoid the abortion itself becoming "illegal", some doctors allegedly do a quick preliminary test and declare it as a female foetus (Rai, Op.cit).

#### Popularity of the Test-

The Amniocentesis tests became popular in the last five years though earlier they were conducted in the government hospitals on an experimental basis. Now, these tests are conducted

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mainly for sex determination and thereafter extermination of female foetus through abortions, in private clinics, private hospitals and government hospitals. This perverse use of modern technology is encouraged and boosted by money-minded private practitioners who are out to make a woman, "a male-child - producing machine". (Patel, Op.cit, p.2).

The controversy about amniocentesis was sparked off, according to Vimal Balasubramanyan, not so much by the fact that these methods constitute a threat to the female sex as a whole, but due to the mistake (of the Amritsar doctors) of hard-sell advertising and sales production (Balasubrahmanyam, 1982, p-1725, Sadasivam, Op.cit, p-1). "Better 500 now than 5000 later", coax the posters by the Bhandari Hospital in Amritsar. (The 500 indicate the price of the test and abortion and 5,000/-, the price of dowry, of the girl is allowed to be born (sic !)) (Gupte, Op.cit).

As per the most conservative estimate made by a research team of women's centre, Bombay, based on their survey of six hospitals and clinics, only in Bombay, 10 women per day underwent the test in 1982. This survey also revealed the hypocrisy of "non-violent", "vegetarian", "anti-abortion", management of city's reputed Hospital - Harkisandas Hospital that conducts anti-natal sex-determination test. Their handout declares the test as "humane

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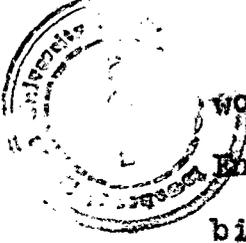
and beneficial". The hospital has out-patient facilities and there is such a great rush for the test that one has to book one month in advance. As the management does not support abortion, they recommend women to various other hospitals and clinics and ask them to bring back the female foetuses after abortion to them for further "Research". (Abraham, Anu and Sonal, 1983).

In other countries, this test is very expensive and is under strict governmental control, while in our country this test can be done between Rs.200/- to Rs.500/-. Hence, not only upper class people, but even working class people can easily avail this facility. (Pael, Op-cit, p.3), Sadasivam, Op.cit, P.1; Darshni, Op.cit, p.1). A survey of several slums in Bombay showed that many women had undergone the test and after knowing that the sex of foetus was female, had undergone abortion in the 18th to 19th week of pregnancy. Their argument was, it is better to spend Rs.200/- or even Rs.800/- now than give birth to a female baby and spend thousand of rupees for their/her marriage when s he grows up. (Patel, Op.cit).

According to a study by R.P. Ravindra, in Dhule, a small district town in northern Maharashtra, with a population of Rs.2.5 lakhs, five such clinics have sprouted in just 3 years; other small towns like Jalgaon and Amravati also have such clinics.

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(Ravindra, 1986). In Bhandup, a suburb in Bombay, it is said there are 4 prenatal clinics. In Vile Parle, another suburb, money is often borrowed from a money lender for amniocentesis and abortion. In Dadar, a clinic is said to have carried out 15,914 abortions in 1984-85. (Rai, Op.cit).



Popularity of this test attracted young workers of Larsen and Tubro, a multinational Engineering Industry too. As a result, medical bills showing amount spent on the test were submitted by the workers for their reimbursement by the Company. The Welfare Department was astonished to find that these workers were treating sex-determination test so casually. They organised two days' seminar in which doctors, social workers, representatives of women's organisations as well as Family Planning Association were invited. One doctor having flourishing business of sex-determination test started in the seminar that "-----from Cape Comorin to Kashmir people ring him up at all hours of the day to find out about the test. So much so that his six years old son has learnt how to ask the relevant questions on the phone like "Is the pregnancy 16 weeks old'. etc." (Amu, 1984).

Three sociologists conducted micro research in Bijnor district of Uttar Pradesh. Intensive

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field work in two villages over the period of a year and an Interview survey of 301 recently delivered women drawn from eleven randomly selected villages in two Community development blocks adjacent to Bijnor town convinced them of the fact that "clinical services offering amniocentesis to inform women of the sex of their fetuses have appeared in North India in the past 10 years. They fit into cultural pattern in which girls are devalued." As per the 1981 census, the sex ratio of U.P. and Bijnor district were 886 and 863 respectively. They also found out that female infanticide that was practiced in Bijnor district till 1900 was limited to Rajputs and Jats who considered "birth of a daughter" as "a loss of prestige". While - abuse of amniocentesis for female foeticide was prevalent among all communities. (Jeffery, Jeffery and Lyon, 1984).

In Delhi, All India Institute of Medical Sciences started conducting sample survey of amniocentesis in 1974 to find out foetal abnormalities. They were flooded with requests for abortion. As soon as the parents were told that the foetus was a girl, they started making arrangements for abortion (Chhachhi & Satyamala, 1983).

A sociological survey in Punjab, selected in the sample 50% men and 50% women as respondents for their questionnaire on opinions of men and women regarding sex-determination test. Among men,

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respondents, were either businessmen and white collar employees of the income group of Rs. 1000/- to Rs. 3500/- per month. While women respondents were mainly housewives. All of them knew about the test and found it useful. (Singh and Jain, 1983). Why not? Punjab was the first to start commercial use of this test way back in 1979. It was the advertisement in newspapers regarding New Bhandari Anti-natal Sex Determination Clinic in Amritsar that activated the press and the women groups to denounce it equivocally.

#### Controversy around Amniocentesis:

Three years back a controversy around Amniocentesis started as a result of several investigative reports published in magazines and journals. One estimate that shocked everyone right from academicians and activists was between 1978 to 1983, around 78,000 female fetuses were aborted after sex determination test in our country. (The Times of India, June 1982).

Sex choice technologies in India have to be viewed in the context of the "government's population control programmes", specifically, the concept of the net reproduction rate (NRR) of one, which means that one woman should replace her mother. (Sadasivan, op-cit.p.40; Gupte, op.cit). The advocates of population control policy want to cash on socio-cultural

values that treat birth of a daughter in the family as a great calamity and perpetuate modern method of femicide to achieve NNRI by 1990 A.D. as per the claims of 7th five year plan. (Patel, Op.cit, p.5). Dr. Malini Karkal, professor at the International Institute of Population Studies, Bombay said that "with the sex ratio at birth at 1 girl to 1.06 boys, the family size with one girl will be 2.06. When the expectation is 2.3 children, this means that the excess number of girls will have to be killed at the foetal stage, to maintain the NRR of one". (Sadasivam, Op.cit).

Although it has not advocated sex determination test as a means of population control, the government stand, as conveyed by a Family Planning official - "because our population growth has reached such an explosive situation that desperate measures are called for". Given the problems associated with oral contraceptives and low popularity of vasectomy, amniocentesis could well be a workable tool, is the argument used to defend the test (Ibid).

To these doctors, deliberate abortions of female foetuses does not appear to be a discriminatory and questionnaire way of achieving the small-family norm because, they say, it is the women themselves who ask for it. "Don't mix morality with population control", says Dr. D.N. Pai, vociferous supporter of amniocentesis. The stand taken by doctors, many women

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amongst them, in propagating amniocentesis only reflects the deeper malaise that afflicts society at large and shows the extent to which the medical profession, cashing in on social prejudices can perpetuate an oppressive status quo. Says Dr. Hema Purandare, a geneticist: "what is the alternative? At least this method ensures that a woman will not go on producing children until she gets a son. There is no question of discrimination because women are exploited anyway." Purandare also makes the alarming declaration that the state of population control in India will be far worse if doctors don't perform sex determination tests. When there is such internalisation of regressive values by the women themselves, doctors and patients alike, that it is a woman's choice, is nothing but self serving and escapist (Ibid).

Thus doctors profess concern over the runaway population growth proposes SD tests as a remedy with the dual purpose of controlling a woman's reproductivity and the number of daughters she bears. At the individual level, this finds ready acceptance among couples looking for the immediate benefit of a desired and 'ideal' family configuration, while at the larger level, its potential to prevent the birth of girls, who are the future 'breeders of society', is welcomed by the State for whom the woman is a reproductive machine. (Sadasivam, Op.cit, pp.39-40).

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The government that refuses to ban the test for sex-determination exposed itself by not providing facility of amniocentesis to pregnant women during Bhopal gas tragedy inspite of repeated requests of women's groups and inspite of many reported cases of birth of deformed babies as a result of Bhopal gas carnage. Thus this scientific technique is not used for humanitarian concern or because of "empathy towards poor Indian women". (Sic..) (Patel, Op.cit, p.5).

Female members of the family get inferior treatment as far as food, medication and education is concerned. (Kynch and Sen, 1983). When they grow up there is further harassment for dowry. "Then, is it not desirable that she dies rather than be illiterate?" ask many social scientists. In Dharam Kumar's words: "Is it really better to be born and "left to die" than to be killed as foetus? Does the birth of lakhs or even millions of unwanted girls improve the status of women?" (Kumar, 1983).

But the worst thing about amniocentesis is, it is practiced by all, irrespective of their class, caste, religion, educational or cultural background (Jeffery and Jeffery, 1983; Sadasivam, 1986, p.38), while female infanticide was limited only among certain castes. (Jeffery and Jeffery, Ibid).

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Harmful Effects of Amniocentesis:

The test is dangerous for the health of both mother and child on the following grounds:-

- 1) Due to the absence of the ultrasonography technique necessary to localize the placenter there is a danger of the "needle hitting the placenta at the time of extracting amniotic fluid from the womb". This could lead to 'spontaneous abortion' (Statesman, 1982) variously estimated between 0.1 and 5 per cent. (Sadasivam, Op.cit, p.41, Medical World News, 1979) causing psychological trauma to the mother. (Indian Express-1982) Many of the doctors make it sound a safe and simple 'scientific' procedure so that women flock to clinics with only a dim idea of what it entails. (Sadasivam, Ibid).
2. It significantly increases rates of maternal ante partum haemorrhage and neonatal respiring distress and major orthopaedic deformities. (Medical World News, Op.cit).

A likely scenario that emerges is that the average Indian Woman, anaemic, married in her teens, undergone a cycle of "conception- sex - determination- abortion- conception", with horrific consequences to her health. A spate of abortions set off by SD tests will aggravate the already high rate of maternal mortality in India which, at 400-500 per 10,000 live births, is the second highest in the

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world, and 22 per cent of which is due to abortions. How will Indian women, 70 per cent of whom are anaemic, bear the hazards of repeated abortions until a son is born?

Even with the development of safer and more sophisticated techniques like chorionic villi biopsy which enables abortions in the first trimester itself, the considerable risks associated with abortion remain. Among them are greater chances of ectopic pregnancy and secondary sterility resulting from infection of the reproductive tract (Sadasivam, Op.cit, pp 39-40).

The Long Term Implication of Amniocentesis:-

India is the only country in the world where the ratio of women to men has been declining over the years. In 1974 for the first time, Prof. Ashok Mitra declared women in India as 'declining sex'.

The following table will indicate

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the demographic profile of India-

Table XI: Demographic Profile of India (in million) 1901-1991

Year	Total Population	Male Population	Female Population	Total No. of women/1000 men i.e. sex ratio
1901	298	121	117	972
1911	252	123	124	964
1921	251	123	123	955
1931	279	143	136	930
1941	319	164	155	945
1951	361	166	175	946
1961	439	226	213	941
1971	548	234	204	930
1981	634	335	351	935

Sources Census Report, 1981, series 1, page-1

The above table indicates that there has been continuous declining in female/male ratio between 1901 and 1971. Between 1971 and 1981 there is a slight increase, but it still continues to be adverse for women.

The over-a-century old trend of decline in the proportion of women in the population, which, according to the census of 1981 has, for the first time, shown some faint signs of being arrested, will resolve reinforcement if such attempts at cancellation of one sex (female) are allowed to

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continue (Resolution adopted for protest against the sex-determination tests, 1982).

Here too, some economists and doctors have their reply ready i.e. 'law of demand and supply'.

If supply of women reduces, their demand as well as status will enhance (Sheth, 1984). Scarcity of women will increase their value (Bardhan, 1982). Dhama Kumar in her article argues that:

But why not see this economic logic through? Sex selection at conception will reduce the supply of women, they will become more valuable and female children will be better cared for and will live longer. We have here a good instrument for balancing the supply and demand for women and for equating their price all over India (since caste, regional, religious and other barriers prevent the movement of women). So in course of time one should expect dowries to fall in the North (Kumar, 1983, p.63).

But here the economists forget the socio-cultural milieu in which women have to live. The society that treats women as mere sex-object will not treat women in a more humane way if they are scarce in supply, on the contrary, there will be increased incidences of rape, abduction and forced polyandry. In Madhya Pradesh, Haryana, Rajasthan and Punjab among certain communities, sex-ratio is extremely adverse for women. There a wife is shared by 'a set of brothers' (or sometimes even by patrilateral parallel cousins). (Dube, 1983, p.280). Under such circumstances, amniocentesis

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will further deteriorate the position of women in our society.

To think that it is better to kill female foetus than giving a birth to unwanted female child, is very fatalistic. By this logic, it is better to kill the poor people or third world masses rather than let them suffer of poverty and deprivation: How Horrifying:

Another argument is that in cases where women have one or more daughters, they should be allowed to have amniocentesis done so that they can plan a 'balanced family' by having son. Instead of going on producing female children in the hope of getting a male child, it is better for family's and country's welfare that they abort the female foetus and have small and balanced family with daughters and sons. This concept of 'balanced family' also has a sexist bias. Would couple with one or more sons undergo amniocentesis to get rid of male foetus and to have a daughter for balancing their family? No. Never.

This frenzy of having 'balanced family' at what cost? How many abortions during 16 to 18 weeks can a woman bear without jeopardising her health? (Patel, 1986, p.8).

B. Sex-preselection Technique or Ericsson's Sperm Separation Method:

The science of genetics has done revolutionary changes by probing the recalcitrant gene under

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microscopes, and discovering the awesome, ultimate human formula: XX=female and XY=male, wherein x= the female determining chromosome, and Y= the male, in this great genetic make-up kit. However, it was only in the late '70s that gynaecologists and geneticists world together conspire to play God to offer the ultimate, irresistible choice to parents: girl or boy? That is because, in 1970, researchers had discovered that chromosome - bearing sperm could be isolated for detailed study.

In the last few years, however, 'Dr. Ericsson's Sperm Separation method' has scientifically improved the odds of gender pre-selection. While not foolproof, it does raise the chances of pre-selecting a boy or a girl from 50% to approximately 75-80%. (Baljekar, 1981, p.76).

Outreach and popularity of the sex-preselection tests can be far more than that of sex-determination tests because the former does not involve ethical issues related to abortion. So even anti-abortionists can use this method. Dr. Ronald Ericsson, who has his chain of clinics conducting sex-preselection tests in 46 countries of Europe, America, Asia, Latin America, announces in his handout: out of 263 couples who approached him for begetting off spring, 248 selected boys and 15 selected girls. This shows that

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male preference is not limited to "third world countries" like India, but it is universal (Patel, Op.cit pp.9).

The Ericsson Technique:-

Apparently used in 48 clinics worldwide, the Ericsson method of sex-preselection is perse not new to genetic engineering. Primarily started to produce male offspring, the technique relies heavily on the still mystic "stronger and faster swimming Y-sperm" theory, for which there is no satisfactory scientific explanation so far. According to Dr. H.T. Mehta, who introduced Ericsson's sex selection service in his City clinic, Bombay, in August, 1986, the procedure in brief is thus:

"For male selection, the process separates out the Y-chromosome bearing sperm by filtering the husband's sperm through increasingly thicker concentrations of human serum albumin. A gynaecologist will then place this Y-enriched fraction of sperm in the female cervix at the time of ovulation, when an egg passes from the ovary to the tube". This method, claims Dr. Mehta (and Dr. Ericsson) has a success rate of 75-80%.

To produce female offspring, the process differs slightly, Dr. Mehta explains: "The sperm is filtered through a carbohydrate microbead column. The Y-chromosome-bearing sperm interact with the beads for some reason, and only the X-chromosome-bearing

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sperm fall rapidly through the column."

Thereafter, the procedure follows the same course of artificial insemination, fertilisation, pregnancy and (hopefully) a baby of the desired sex at the end of it all (Baljekar, Op.cit).

#### Boon to Genetic Maladies:

There is, however, one area in which sex-preselection (once the technique has been perfected) may prove an undisguised blessing - in producing a healthy baby from a hazardous, genetic environment. "Sex-preselection", comments Dr. Mehta, "can be used to control sex-linked and sex-influenced diseases like haemophilia and parkinsonism". Haemophilia, for example, is a genetically - transmitted disease which can only be contracted by the male foetus, and in which the female can only be a passive carrier. So, if the medical history of the parents indicates haemophilia, they can without much ado, pre-select a daughter instead of undergoing the agony of aborting a male foetus. Or worse, letting it live with haemophilia (Ibid).

#### Limitations to the Sex-pre-selection tests:

As far as sex pre-selection methods are concerned, there is no laboratory method at present that gives a 100% chance of success. While not foolproof, it does raise the chances of pre-selecting a boy or a girl from 50% <sup>to</sup> approximately 75-80%. In Dr. Mehta's clinic in Bombay, the final outcome appears to denote a paltry four absolutely guaranteed cases of a possible male child out of 49 ! That, too, if the pregnancy is

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carried to full term without mishap. According to Dr. Indira Hinduja, India's pioneer in test tube babies, chances of success are greatly diminished in these tests. That's because, after separation, the quantity of sperm itself is reduced. This viewpoint is also shared by Dr. R.P. Soonawala, India's best known gynaecologist:-

We don't recommend this method because present research cannot really guarantee that the Y-sperm definitely will fertilise the ovum. After all, even though the Y-sperm is more active, it also perishes faster than the heavier but longer-living X-sperm. So there are strong chances that if the exact day of ovulation is not calculated accurately, the X-sperm may outlive the Y-sperm, because the ovum, and you'll get a baby girl instead of a boy! This could and does happen.

One of the reasons for the high failure (and high cost) of this method is the difficult task of pinpointing the precise ovulation time of the woman even though sophisticated sonography is used. This makes conception at the very first insemination rare. "It takes, on an average, at least three inseminations before conception occurs, even though the patient is continuously monitored for about six days prior to the expected ovulation time. Sometimes, we even do two and three sonographic ovulation profiles a day", admits Dr. Mehta. This not only adds to the cost but also to the time and tension spent. The whole process can take anything from two-eight months, and a patient would be lighter by Rs. 3,000 min. per insemination (so about Rs. 10,000 for the three inseminations required on average !)

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In sex pre-selection cases, there is a marginally higher risk of having a miscarriage or foetal deformities (due to the sperm getting damage during the lifting out.).

Implications of sex Pre-selection tests:

Ever since its discovery and application, potent clouds of controversy have been gathering momentum over the issue of sex pre-selection. These have largely centred around the grim sociological and ethical ramifications it is likely to have, given the widespread preference for male children over females, in India particularly.

Dr. Mehta gesticulates helplessly, waxing eloquent instead on the short-term goal of, "I just want to make people happy". In fact, he sincerely believes that his (and Dr. Ericsson's) marvellous method will actually "reduce the number of female abortions, and foeticides to the extent of 50-60%, since all parents will get the baby of their choice." At the same time, he admits, that "most of these women will go in for an abortion if they find out that they are bearing girls" instead of the much yearned - for boy; which means that Dr. Mehta's method cannot afford its high 20% chance of failure of what value will his efforts be if they will end in abortion and dismay for parents after so much money, tension and time have flowed under the bridge? (Ibid).

'Perfect Family Planning'

Dr. Mehta argues that "Sex Pre-selection helps couples to achieve the child of their desired sex.

It will also prove to be a boost to family planning. Family Planning does not mean only curtailing births, but making the family happy by giving the couples what they want".

Of-course, it hasn't yet occurred to Dr. Mehta that, instead of pondering to parental preferences for male progeny and perpetuating the great male-female divide in India, he should work towards long-term, more definite solutions in family planning. Solutions which would not further endanger the fragile status of the Indian woman. His own figures for sex- pre-selection (49 for male, 3 for female) display this overwhelming partiality. As he himself reveals (reluctantly): "If a couple has two daughters, they will always try for a son; but if they have two sons, it is unlikely that they will undergo the programme in order to have a daughter. The son, obviously never sets on the Indian empire (Ibid).

#### A Nation of Second-Class Citizens:-

Apart from pulling the Indian woman a few more pegs below ground level zero (she was never on cloud nine to begin with), a large-scale application of sex selection techniques to produce boys will result in a 'dangerous demographic imbalance'. Because, at some stage, sooner or later, would-be parents are going to clamour for sex pre-selection for the very first-born child. By all odds (as present statistics reveal), the male will win precedence (he always has). Later, a few conscientious parents will wishing, in patriotic fervour, to honour the 'hum do, hamare do' exhortation, may pre-select a

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daughter. The net result will be, firstly, a vastly reduced female population, and secondly, even these 'chosen few' might well turn out to be docile 'second-class' citizens, going by the findings of recent sociological surveys, both in India and the United States. These claim that the first-born is more intelligent, has greater opportunities, adjusts better socially, and is a more aggressive go-getter as compared to later-born siblings.

Most of the gynaecologists are in favour of some kind of sex pre-selection in India. Dr. Indira Hinduja says: "When you see the miseries these girls go through, the bride burning, the cruelties heaped on them for not producing sons, I feel it is far better for them to choose a male child than to suffer.-----Some of them (women) are told not to come home till they've produced a son ! It's ironical, seeing that it's the male chromosome that decides the sex of the child !

Dr. R.P. Soonawala is of the opinion that:

... still, failure to produce a pre-selected baby is quite common. And, if a couple gets a girl instead of the boy they have selected, some do ask for abortions. On this issue, even I feel it is better to terminate the pregnancy at that stage than to have both mother and daughter neglected later, as it is, the mother is made to feel guilty as though by giving birth to a daughter, she has committed some crime. This can leave her very depressed and dejected.

Dr. Kusum Zaveri, a well-known gynaecologist said:

If we do get a 100% successful and cheap method of sex pre-selection, instead of a few at present, all women will be pressurized to produce only males. Sex pre-selection is a short term policy.-----"Is the woman a machine, that she can go on producing children till she gets a son? I often ask the husband, if you had to go through all this, would you want a male child still?"

Dr. Metha is optimistic that further Rand would definitely lead to "an effective means of sex selection. There would certainly be a red capsule for a boy and blue for a girl in the very near future" (Ibid)

Sex selection might well turn out to be, not the promised "birthright" that it advocates believe it to be, but perhaps a "birthwrong".

Though scientists and medical professionals deny all responsibility of social consequences of sex-preselection and sex determination tests, the reality shatters the myth of neutrality of science and technology. Hence the necessity of linking science and technology with socio-cultural reality.

These tests are due to consequences of 'rigid sex stereotyping' and 'rampant dowry'. The strong 'boy preference' communities takes the form of female foeticide. The widespread availability of such tests bring greater pressure to bear upon a woman to avail of them and abort fetal foetus, thereby leaving her even less in control of her reproductive freedom. "Choice" in India, is restricted and determined by sex, class & caste. To choose the sexes of children is the original sexist sin. It is an act which makes the basic judgement of the worth of a human being rest first and foremost of its sex.

C: In-vitro Fertilisation ( Test-Tube Baby)

There have been dramatic breakthroughs in the ability of science to affect the process of conception. Through procedures like artificial insemination and the recently successful in vitro fertilisation and embryo transfer, technology already has the power to alter radically the nature of reproduction. Conceivable developments in genetic modification, human cloning, and the artificial womb may offer choices that can affect all aspects of human life, from the nature of the family to the composition of future generations. These technological changes will have strong impacts on women, in whose bodies reproduction traditionally has occurred. (Wintere, 1983, p.221).

In-vitro Fertilisation or the Test Tube Baby:

In-vitro fertilisation, i.e. the fertilisation of an egg in a laboratory dish by adding sperm, those producing a 'test tube' embryo, has become a technologically simple procedure. In order to make this procedure successful, however, one does not simply need eggs and sperm, but the eggs have to be 'mature'. Put differently as a first step the 'egg donor' has to undergo hormonal 'support' therapy before her eggs can be 'collected'.<sup>(1)</sup>

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(1) 'Egg harvesting' is the usual term used in this context. Another commonly used expression is 'Egg capturing'. Women are called 'egg donors' by the technodocs or 'embryo carriers' or simply the 'maternal environment' - which says a lot about the kinds of attitudes technodocs have towards women.

Then, the mature eggs are removed from the ovaries by surgery under full anaesthesia with the help of a laparoscope ( a tube-like instrument with a fibre-optic telescope). A laparoscopy is thus a major operation, during which the ovaries are traumatised and carbodioxide is pumped into the woman's body. Women who have undergone this operation, describe it as highly unpleasant or even very painful.

The collected mature egg ( or the egg if the woman has been made to 'Superovulate', i.e. to produce more than one egg by massive doses of hormones) are fertilised in-vitro and develop into a two-cell embryo, and then into a four-cell embryo (Klein, 1984, p.93).

The basic in-vitro technique is only a first step for many 'variations on the theme'. For example :

- a) The embryo is inserted into the womb of the egg donor, i.e. its genetic mother ('woman 1') and if the transfer is successful the implanted embryo grows into a foetus. Problems with nidation and a high rate of miscarriages are responsible for the fact that only a maximum of about 20% of all implanted embryos develop into foetuses and finally into a viable child.
- b) The embryo is inserted into another woman (woman 2') who carries it to term thus becomes the child's biological mother as her body provides the material for the development of the foetus - she could be a hired surrogate mother who offers her body for money ( ' a job like any other') and who later 'delivers' the product, i.e. a baby.

c) Before a) or b) happens, one of the four embryonic cells is removed and checked for chromosomal defects ( this is called genetic screening). In the meantime, the other three cells and the other embryos ( if more than one have been fertilised) are frozen. If the laboratory results are right, a) or b) can take place ( the embryo is at this point still able to regenerate the missing cell). And again, there are a number of possibilities : only one embryo is implanted in a woman's womb; the others remain frozen and thus available for a later pregnancy or upto sex embryos are implanted with the hope that atleast one of them will develop or they are used for experiments. And, in the future, they may even be sold .

Thus human beings can become genetic parents even after their death if their frozen embryos are thawed and implanted into a surrogate mother's womb. In Summer 1984 the international sensational press brought us two heart breaking stories from Australia came the tale about the orphaned frozen test tube embryos whose parents had died in a plane crash; and from France, the desperate law suit of a woman to use the frozen sperm of her late husband for artificial insemination.

Many more possibilities can be envisaged. Already the international technodoes report another 'success' with the help of a technique called 'flushing' in Australia and 'lavage' in England, the phenomenon of the temporary surrogate mother has been created. A developing embryo

'surrogate mothers' has been created. A developing embryo in the uterus of a woman who has either become pregnant 'naturally' or who has been artificially inseminated, is flushed out after 3-4 days before its nidation and implanted into the womb of the sperm donor's partner (in most cases his wife). This second woman thus takes on the role of the biological and social mother; a further step in the assembly line production of children. Of-course such flushed-out embryos need not be implanted immediately but could be frozen and stored for further use (Ibid, pp 93-94).

The success rate in in-vitro fertilisation is as low as 20-25 percent. This is because the process, mistaken by many as a cure for infertility, is effective only in instances where women do not conceive, due to abnormal oviducts, the tubes through which eggs travel from the ovaries and meet sperm in transit from the uterus; or due to "hostile cervical mucus", a term used to describe improper consistency of the channels through which sperm swim, or the production of sperm antibodies, or where the partners sperm count or semen volume is low (Wintess, op.cit, p.224). Such instances account for only about 30 percent of the total number of cases of infertility.

The "miraculous" nature of the technique, however, encourages a large number of women to try their luck, many of whom, to the glee of the gynaecologists concerned, will go to any lengths to scrape together the Rs. 5,000 - Rs. 10,000 (or more-figures are vague) that the treatment is supposed to cost, regardless of the results (Ranganathan and Bahl, 1986, p.1).

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Impact of In-vitro Fertilisation on women:-

The In-vitro fertilisation (IVF) has both medical and social repercussions on women. An important concern in the use of IVF is the health and safety of the women on whom the procedure is tried.

Issues Affecting the Embryo:-

Those who believe that the newly fertilised egg is a human being with the right to life - a "person", in the jargon - and that the right to life entails the right to be kept alive have moral objections to IVF if it involves the disposal of embryos that are not implanted. (Purdy and Tooley, 1974; Thompson, 1973).

Problems of embryos disposal arise primarily in clinics where it is the practice to induce superovulation through drugs so that several eggs can be removed at once, increasing the odds of producing a successful candidate for implantation and minimizing the likelihood that the woman will have to undergo further laparoscopies. But what is to be done with the "surplus" fertilised eggs? (Winters, op.cit, p.225).

Another problem with respect to the embryo's interests concerns the possibility of producing defective babies. There are possibilities of damaging the sperm or egg during the fertilisation procedure or the embryo during transfer to the uterus. Some argue that even apart from damage, IVF has a greater chance of developing abnormal babies since it might use defective sperm that would normally not succeed in reaching the egg. The

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degree of risk of defects in IVF is not known at present, both have involved only one reported abnormality: a heart defect. Some argue that any risk at all renders IVF unacceptable, while others hold that some risk is acceptable if it is no greater than the chances in normal reproduction. For example, fertility drugs are given that have risks of fetal defects and of multiple births where one or more of the fetuses doesnot survive. There doesnot yet exist a clear policy on risk to the foetus (Ibid, p.225).

Issues Affecting the Women:

IVF involves a number of risk to women: a chance of tubal pregnancy if the embryo fails to implant in the uterus, extensive monitoring of the pregnancy, including amniocentesis; possibly repeatedly laparoscopies usually under general anaesthesia which is highly unpleasant or very painful; possibly greater than normal chances of spontaneous abortion; and delivery by caesarean section in most cases. (Ibid, p.226). The administration of hormones for the purpose of superovulating - that is, for producing upto ten eggs in a cycle instead of the normal one or two, to ensure a higher rate of success, can lead to ovarian cysts. (Ranganathan and Bahl Op.cit, p.1) Winter, op.cit, p.226). But the other effect of these harmones remains unknown. "No medical practitioner," says Dr. Eustace Desauza, exclusive director of the FIAMC Biomedical Ethics centre, "can predict the long-term effects of any drug". (Ranganathan and Bahl, Op.cit, p1).

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There is also concern that infertile women, desperate to have a biological child, will agree to any invasive procedure or degree of risk to accomplish this goal. And it is argued that their motivation must be a product of beliefs conditioned by sexism - that a woman is worthless if infertile or that the only meaningful life for women involves having children (Winters, op.cit, p.226).

Past experience has shown that women in India and other underdeveloped countries are often subjected to experiments without their knowledge (as in the case of NET-BN, the injectible contraceptive). Questions inevitably arise with regard to IVF and related techniques.

Who are the women drawn into such experiment? Are any of them articulate, well-informed, literate volunteers from the middle or upper classes, capable of rejecting a drug whose side-effects are injurious or painful to bear? Or are they, rather, infertile women from the poorer sections (like the mother of the test tube baby recently born in Bombay), who entered into the programme with the reward of being able to finally bear a child?

One of the dangers of techniques like IVF, according to a gynaecologist, is that women who are desperate to have a child, might, despite the odds, continue endlessly with the treatment in the hope of finally achieving success. In other words, new treatments for infertility have created a burden for those who are infertile. How many years will a woman have to put up with dangerous

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experimental drugs, operations and medical tests before she can withdraw with a clear conscience?

IVF raises further questions. In cases where a donor's sperm has to be used or are they sometimes left in the dark, in the belief that they are better off without the knowledge? US feminist Robyn Rowand relates a case where a physician, in two separate instances, used a brother's sperm to inseminate a wife without the knowledge either of the receiving couple or of the donor's wife. "Considering that the result of these two particular cases is the creation of happy relationships," says Schoysinan, the physician concerned, "we have no regrets". This goes to show how easily unethical situations can be justified by medical experts who often take on the role of moral guardians as well. (Ranganathan and Bahl, op.cit, p.1)

Apart from the medical hazards of such a venture, there are social ethics involved. What are the implications of IVF and of allied techniques in any society, especially Indian Society?

One argument raised in this context concerns the population as well as that of poverty. Does it make sense of the government which on the one hand, zealously supports population control measures, to finance, alongside the production of test-tube babies, that too in a country which faces for greater medical problems than infertility? (Ranganathan and Bahl, op.cit, p.6). According to Maria Mies, a Sociologist, "India does not need a test-tube baby - neither

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does the world. Why on earth should they do it here when the government's emphasis is on family planning and when there are already so many children waiting to be adopted? (Mies, 1986, p.13). Asks Dr. Eustace Desouza, "can our country afford such exotic research? Isn't adoption a far cheaper and more acceptable solution to infertility?" (Ranganathan and Bahl, op.cit, p.6). But the argument used in this favour is: Why do you want to deny an infertile couple the right to have a baby of their own?

However, the most esoteric medical research is justified on the grounds that there are people who will benefit by it. And there are any number of people who believe they will benefit by IVF. In fact, the words of a woman in an IVF programme in Australia might well be echoed by her counterparts in India: "I don't see how being infertile is so different to being deaf or blind. You just aren't complete". It is bad enough that our notions of what and who is "complete" should be dictated by stagnant cultural norms, but even more disturbing is the fact that the desperation of infertile women, unable to meet the cultural definition of womanhood, is unquestioningly accepted by our medical researchers and lawmakers - and perhaps even used to get funds for research not necessarily meant to help the infertile persons (Ibid).

The effect of new reproductive technologies on women in various countries of the world that the so-called 'infertile' woman (of-course, in forty percent of the cases

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the fault lies in the man) is used as a front to open the doors for all those dangerous medical practices which can be used against all women - also against men. For instance, techniques like amniocentesis, in-vitro fertilisation and genetic engineering or "gene therapy" opens up a whole range of engenic possibilities - our medical establishment is trying to create 'a perfect human being'. (Mies, op.cit, p.13).

In-vitro fertilisation establishes a totally new relationship of a woman to her body. Uptil now, men had to control the whole body of a woman in order to control her reproductive capacities. For instance, they had to invent elaborate marriage codes to ensure that the offsprings were theirs. Now it is possible to divide a woman's body into various relevant reproductive parts like 'Ova', 'Uterus', Fallopian tubes. You can extract them, analyse them, monitor them dissect them (in gene therapy you can even extract the nucleus out of an egg and insert another one !) and then combine them with the sperm.

This means that the woman becomes an arsenal of reproductive raw material, out of which a doctor produces a new product - the child. The child is born by the woman but it is the doctor who produces child, like an engineer produces a technological gadget. In fact, these doctors are reproductive engineers or technodocs. They are not therapists any longer, because they donot cure the sterility of the man or woman, instead they technically fabricate a child.

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If women accept this state of things, allow their reproductive organs to be used for the technical production of children, they will establish a property relationship with their own bodies. The head becomes the "owner" of the uterus, the ova, etc., and can sell them or hire them out for money. This, in turn, will open up the avenues for other commercial interests to step in (Ibid, p.55). The New Reproductive Technologies involve extracting eggs from genetic mothers, manipulating them and transferring them to suitable incubators, so that "women will be able to sell reproductive capacities the same way as prostitutes sell sexual ones". (Sadasivam, 1986, p.41). If we want to avoid this frightening prospect, we have to say that we are our bodies, instead of saying our bodies belong to us. (Mies, op.cit, p.55).

The feelings of women who decide to have an in-vitro child, their emotions during the long and often painful process of hormonal pre-treatment, the collection of egg(s) and the implantation of the embryo, their utter disappointment if despite all the technology they have a miscarriage - now they are total failures! - all this has no room in the discussion of the new reproductive technologies (Klein, op.cit, p.94). For many women, this period was full of emotional ups and downs, they alternated between hope and despair. Some of them had to have their eggs extracted several times through laproscopy. (For every <sup>one</sup> successful test-tube baby, there are, on an average, about 95 women who go home without a baby). The whole thing was really degrading (Mies, op.cit, p.55). The infertile woman is treated

as a defected vessel, as a malfunctioning incubator, that has to be mended in order to fulfil its duty: the procreation of a child. It is not made clear that in-vitro treatment can, at most, be used on one third of the involuntarily childless women, and also that it does not provide a cure for infertility but at best a one-off technological 'fix'. No word either that in-vitro technology is only accessible to those women whom conform with the idea of the 'good' woman in techno-patriarchy: heterosexual, preferably married and living in 'stable circumstances' and without physical disabilities. And above all willing to undergo the treatment without asking questions. The perfect patient is the positive test-tube woman who deep feels guilty about her <sup>bodily</sup> ~~body~~ insufficiency and is thus willing to undergo whatever (inhumane and painful) treatment is necessary to make good the 'deficiency'. (Klein, op.cit, p.94). One woman said, "you feel like a piece of flesh in a flesh factory, when you enter the hospital you leave your pride at the doorstep you do it only because you want a child at all costs." (Mies, Op.cit, p.55).

Racism and Eugenics, two other foundation stones of the dominant patriarchal ideology form an integral part of the new reproductive technologies too. It is not really the misery and pain of infertile women which motivates the work of the reproductive technologists.

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Rather they develop and apply methods according to the needs of those in power. In the western world, for instance, poor women and women of ethnic minorities are not encouraged to become test-tube mothers (Klein, op.cit, p.95). IVF must be viewed in the context of sperm separation techniques, frozen embryos, surrogate motherhood and genetic counselling, all of which point to a tremendously ambitious but misguided effort to control the quality of the human race, by helping to produce the 'right sort' of babies, be they male fair skinned or super intelligent. For India, it does not take much imagination to visualise a situation in which even women who are perfectly capable of bearing children, the normal way may be coerced into accepting test tube babies, to produce a child of the desired sex and in time, perhaps the desired colour as well. (Ranganathan and Bahl, op.cit, p.6).

Even the simpler of the reproductive techniques such as fetal monitoring have served to distance women from their bodies and increasingly hand over an entire area of their lives to professionals who "know it all". Information that the doctor once acquired by resting her head near the woman's belly, smelling her skin or feeling her breathe, can now be had through monitor screens, strips of print-out and other products of biomedical technology. (Ibid).

The new reproductive technologies make it possible to not only control the reproductive machinery of the human species, but to take the actual production of human

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beings out of people's own hands. Today the technodocs still need women's bodies - or at least parts of them - but what will happen once the artificial womb has been perfected? What will happen once cloning<sup>2</sup> has become a technically simple procedure? What will be destiny of women? (Klein, op.cit, p.95). They could be supervisors on the child - production farms and sexual objects in the brothels run by the State as the American feminist Andrea Dworkin predicts? (Dworkin, 1983). And they could be even poorer, even more exploited, even more exclusively stuck in the hardest, lowest paid and dirtiest jobs, while the unemployed men become 'house husbands' and 'parent' their artificially created offspring as the Australian writer Dall Spender describes in her vision of 'Post-Industrial Man?' (Spender, 1985). Thus, 'Biology' seems to become women's destiny once again and once again the experts' are trying to 'mould' us according to their images".

Looking further ahead, do women really want a test tube culture in which the reproductive process becomes so distant and commercialised that babies are 'selected' in the same way as clothes and furniture, with law suits being fought over 'defective' products, as in the west, where such technology is already in use? Seen from this angle, the new, supposedly

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2. 'Cloning' is a form of a sexual reproduction in which the offspring is genetically identical to a single parent whose body cell nucleus is used. Cloning would make possible sex determination in advance. It can offer a means of reproduction preserving at least half of their genetic heirtage.

radical reproduction technology consists of nothing more than a package of incentives offered by medical "technicians" intended to strengthen the prejudices and to worsen already background social conditions, not just in India but in the rest of the world as well (Ranganathan and Bahl, op.cit, p.6).

The main objection to this whole thing is that with such procedures human dignity is no longer respected - neither of the mother nor of the child, which has become just a commodity. It robs a woman of her capacity to give birth to a child. According to Maria Mies, "the future family will consist of a man, a woman and a doctor - with their common "product" the baby. !"

D. Contraceptives:-

With the advancement of medical technology, numerous contraceptives have been discovered like hormone-based contraceptives such as injectibles (NET-EN), implants, pills, vaginal rings and hormone releasing IUDS. Most of the contraceptive research continues to focus on women-based, presumably, on the assumption that since it's the woman who has to bear the burnt of child-bearing and rearing, family planning is her baby, too (Joseph, 1986, p.45).

The majority of contraceptive methods, of course, have their side effects and these are particularly hard on poor, undernourished women, who have no rest from their daily, back-breaking workload and whose health is already badly neglected. The lack of follow-up and the tendency to dismiss women's complaints as psychosomatic exacerbates the problem (Ibid).

The paradox which characterises the family planning scene in India is this: on the one hand, women are the major target of the family planning programme, with both messages and methods beamed intensively at them. On the other hand, the fact that contraception needs of these women, who predominantly belong to the lower socio-economic class, are not adequately catered to. In a country like India, women can be doubly victimised. By the patriarchal family which refuses to allow them to use contraception and by the population controllers who make them the targets of unsafe contraception programmes". (Balasubramanyam, 1986).

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In the light of the above situation, it is necessary to analyse the impact of contraceptives on women. The most commonly contraceptive methods pushed by the FP Programme: the oral contraceptive (or the pill); the intrauterine device (IUD) and sterilisation (tubectomy - now commonly performed by laparoscopy).

Pills came into use about two decades ago - the first time in pharmaceutical history that a powerful drug was given to healthy people, - it was hailed as convenient, effective and safe. Now it is no longer considered safe by women in the west. Considering its effects on a woman's body, it is small wonder that oral contraceptives have a low acceptance level and high drop-out rate among Indian women, too. But this is blamed on the distribution system, rather than on the real adverse health impact experienced by women. (Joseph, Op.cit, p.47).

The pill is quite safe for women not suffering from high blood pressure or diabetes, but it is expensive, its storage and supply in rural areas presents many problems and, most serious of all, the woman may forget to take it each day. (Kapil, 1985, p.855). Majority of rural women are illiterate, it is difficult for them to follow instructions for pills (Pettigrew, 1984, p.1000).

IUDs are prescribed as a temporary fertility control measure and in 1981 the Indian Council of Medical Research (ICMR) claimed that they are effective,

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safe, reversible and economical. (Joseph, op.cit,p.47). But in many cases it is not 'nature', but rather technology which damages our bodies, for example, the IUD causes chronic infections of the womb (kilen, 1984, p.94), perforation of the uterus, pelvic inflammatory disease, spontaneous abortion and danger of infection if pregnancy occurs (as it does in about 5 percent women in a year) and increased chances of ectopic pregnancy (one in 30 pregnancies, as opposed to one in 125 among non-users) are possible complications. A recent US Food and Drug Administration panel, recommended that both physicians and IUD users be made thoroughly aware of increased risk of pelvic inflammatory disease and its possible interference with future fertility. And, in January, 1986, the Copper T and Tatum T, the two IUDs made by GD Searle, were withdrawn from the US market - though they continue to be sold overseas - ostensibly because they had become low-profit items and targets for lawsuits (775 to date) (Joseph, Op.cit,p.47).

The IUD can be ideal for a reasonably healthy woman but for the programme it entails a heavy input of skilled manpower. It must be inserted by a skilled paramedic or doctor. Even then, regular medical attention is needed, since the woman's body can expel it without her knowledge. It should be periodically checked and replaced (Kapil, op.cit, p.855). But often IUDs are inserted in rural women without proper sanitation or after-care (DAWN Report, 1985, p.41).

Bleeding is also a common complaint with IUDs- blood loss increase from 50 to 100 per cent, takes a severe toll on an already undernourished woman suffering from iron

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deficiency, anemia. (Joseph, op.cit, p.47 ; DAWN Report, op.cit, p.41, Kapil, op.cit, p.855; World Development Report, 1984, p.132).

Sterilisation of women has become a major FP technique after the "Sanjay effect" on male sterilisation. About 85 per cent of the sterilisation done recently are tubectomies, although vasectomy is a much simpler operation (but the last time men were made the main targets of the FP Programme, a government was overthrown !). Mohsina Kidwai, the former Union Health Minister, admitted on April 25, 1986 that over the last three to four years, the number of vasectomy cases has been on the decline. She conceded that the burden of accepting such permanent methods was now heavily on women, although it is clear that because women, especially from agricultural labour households, cannot take rest and avoid strenuous work even temporarily, medical interventions like tubectomy have a detrimental effect on their physical and mental health (Joseph, op.cit, pp. 47, 49).

Tubectomy operations in women lead to pain in the pelvic area and lower back region after the operation. (Petrigrew, 1984, p.995). Her wounds may become infected. Because of malnutrition and poor health, she will heal slowly and suffer considerable pain. (Kapil, 1985, p.854). This affected their work capacity and thereby, their relationship within the family, to their children and to their husbands (Petrigrew, op.cit). Her children, now irreplaceable and whose work is necessary to family survival, have a nearly 75 percent higher chance of dying than does an urban child (UNICEF, 1984, p.30).

The woman's experience of pain cannot be declared invalid but that status is ascribed to them when the doctors does not investigate this pain and cursorily brands it 'psychological', claiming a woman is saying she is in pain only to attract attention to herself. (Petrigrew, op.cit).

Female sterilisation is supposed to have become simpler, faster and safer with the laparoscopic technique, but there are indications that this is actually more unsafe than traditional, surgical sterilisation (Joseph, op.cit, p.47).

Laparoscopy involves the use of an instrument which can be introduced into the abdomen through a tiny puncture less than 10/12 mm in length. The instrument is fitted with a 'cold', <sup>light</sup> (using the technique of 'fibre optics') and a set of lenses for viewing the organs inside the abdominal cavity. Other specialised instruments can be introduced into the telescope-like tube and operations can be performed without opening up the abdomen. Sterilisation through laparoscopic method is performed by excluding the fallopian tubes (which convey the mature eggs from the ovary to the uterus) either by using rings or clips, or by cutting cauterising the tubes (Prakesh, 1984, p.453).

The risks involved in using this method for female sterilisation are many. Firstly, the procedure involves the 'remote' controlling of instruments inside the abdomen, and small error of judgement on the part of the surgeon can result in major injury, such as the puncturing of large blood vessels or severe injury to the bowels. Inappropriately placed rings or clips can result in a failure of the operation. If the instrument is not properly sterilised,

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severe infections are a distinct possibility and could lead to deaths. If the cauterisation method is used, this could result in burn injuries. But usually the risk of death is less than 0.5 percent, 100,000 operations (Ibid, Basu, 1985, p.425).

The Indian Association of Gynaecological Endoscopists (IAGE) recommends that to keep the instrument sterile, no more than 25 operations a day be done, the actual number performed in a sterilisation camp is closer to 500. The camp sites, more-over, are usually unhygienic and, after a few hours, the surgeons fatigued and undoubtedly prone to making errors that can cause irreparable damage to the patients. Certainly, the death rate from sterilisation in the camps, an estimated 10 to 12 per 100,000 operations, is higher than the rate of 0.25 to 0.5 expected when the procedure is done under acceptable conditions (Prakesh, op.cit, p.453).

The IAGE has laid down certain guidelines for laparoscopic sterilisation but these are not adhered to in mass camps. It would seem as if the aim is not merely to limit population, but to actually eliminate it :(Joseph, op.cit, p.47).

The focus in the development of contraceptive technology is on hormones, drugs and invasive devices. Little research is done on safer and cheaper mechanical and barrier methods, on contraceptives that act locally rather than systematically or on methods that require no mechanical intervention at all (Ibid). In the context of the development of more invasive techniques (e.g. IUDs and hormonal implants),

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the trend toward making birth control more "woman centred" can have negative implications for woman. It lets men off the hook in terms of their responsibilities for fertility control and places the burden increasingly on women. (DAWN Report, 1985, p.41). Safety is, often sacrificed at the altar of ease-in-delivery. The argument is that the benefits to society outweigh the risks to any individual woman. But, as Sathyamala counters, it is a drug's risk and benefits to individual women, and not to society, that ought to be weighed and given precedence.

One of the most disturbing aspect of family planning programme, in India as well as in other Third World Countries, is that drugs and methods adjudged not safe or suitable for women in Western countries are dumped on a developing countries, especially those whose governments are dependent on foreign aid (Joseph, 1986, p.49).

The contraceptive fair has now thrown up a new toy - a "long acting hormonal injectible" which is being brandished as the ultimate in efficiency and safety, and the answer to the country's burdensome population growth. Cynics refer to the touting of this drug as 'the cafeteria contraceptive concept', carefully copied from a West, which is, ironically, turning its back on hormone-based injectible contraceptives. The method, which will take precedence over all other means of birth control, is now being tested at the final human stage by the ICMR (Sarin, 1986, pp.16-17).

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The two tested, highly effective injectibles are:-

1) Medoxyprogesterone acetate in its depot form (DMPA; Upjohn Company trade name, Depo-Provera) (DP) is marketed since 1963. According to Padma Prakesh, writing in the Indian Express, more than ten million women all over the world (including India) have used it at some time or the other. The drug has been banned for domestic use in the US. India can easily be pressurised to license the use and manufacture of DP (Joseph, op.cit). DP needs only one injection every three months for prevention of pregnancy. (Savvy, 1986, p.64).

2) Norethindrone enanthate (NET-EN) Schering AG trade name, Naristerat),. NET-EN produced by the West German firm Schering in 1957, was first marketed in Peru in 1967 but was withdrawn in 1971 after pituitary and breast nodules was found in rodents treated with the drug, but it was concluded that the findings in rats were not applicable to human beings and the drug went back to the market. By 1983, Norigest was available in 34 countries, the majority of whom were in the third world. (Health for the millions, Op.cit, p.10).

NET-EN is being sought to be introduced into the FP programme. It will be convenient and cost effective, of-course especially for use in mass programmes. It is easy and quick to administer, its effect lasts for three months and unlike the pill, it can be "forgotten" by the woman. (Joseph, op.cit). But detractors insist that, apart from constituting a violation of human rights by using ignorant women in rural areas as guinea pigs, the

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method also removes the woman's prerogative to exercise control over her own fertility. They have not only defined the syndrome as "blindly Malthusian," but have called on the Supreme Court to impose an immediate ban on the marketing of Net-En. (Sarin, op.cit, p.17).

Other injectibles like Norplant - an intramuscular injection which staves off pregnancy for five years by implanting two innocuous looking capsules under the skin has also come. Its main advocate was Dr. Girija Dhar of the Sirinagar Medical College who recommended it wholesale for the 125 million couples who came under the purview of the Ministry of Health's Family Planning drive. The ICMR is now at the second stage of developing Norplant II, termed as the "covered rod" concept. Strangely, the anti-FSH vaccine, 20 versions of which have been manufactured and rejected in the West, is being tested here in complicated clinical and toxicological experiments, and the first human trials of FSH will begin in 1987. The drug will block reproduction for six months. (Ibid).

#### Scope for Misuse of Injectable Contraceptives (ICs)

In the earlier trials carried out in 1983, 1,553 women were injected, while the pilot study, carried out by the ICMR covered 2,602 women. Now the fourth and final phase of Net-En tests will be conducted on 2,500 women, and will assess the logistical problems of introducing this drug in a segregated and mainly rural market (Sarin, op.cit, p.17).

Several disturbing questions have been raised by women's groups and health activists about the ethics of the clinical trials of NET-EN conducted by the ICMR, the alarming scope for misuse that an injection allows and the feasibility of

ICs in a country where public health facilities are known by their severe limitations. In India, testing is done mainly in government-run-public hospitals and in rural areas where the women are uneducated and from the low or no income groups. (Sadasivam, op.cit, p.1886). Many drugs are tested on women, particularly in the Third World, mostly without their knowledge. One justification put forward is that, most of the women are illiterate and that it is, therefore, not possible to make them understand. But, as Satyamala points out in her MFC paper, "if it is not possible to get informed consent from illiterate women, why not take literate women for testing?

Another point raised by defenders of such research is that poor women obviously don't mind, since they do come forward to undergo testing. Actually these women are tempted by the incentive offered. But isn't this a way of exploiting the economic dependency of certain classes of women? (Joseph, op.cit, p.49). At Pattancheru, near Hyderabad, the women who had been chosen for the ICMR trials were among the poorest of the poor, and were clearly undernourished. Nearly all of them were not in the physical condition needed to undergo the Net-En test. As one of the social workers put it aptly: "what are these women if not guinea pigs?" (Sarin, op.cit, p.18).

The ICs has immense potential for abuse in the hands of health personnel pressurised to achieve targets. The history of India's FP programme is replete with instances of abuse of various methods 'pushed' under pressure at various points of time. (Ibid). There is higher potential

for abuse because it is an injection. An injection is so easy to give without a woman's knowledge. There was the case of a black 14-year old girl in Britain, who had been given Depo-Provera without her knowledge while she was under a general anaesthetic for an abortion. She only found out about this 'by accident' when she asked for her pill prescription. Then in Scotland, another woman was given Depo-Provera as a glucose injection. (Savvy, 1936, p.64).

The present health system in India, which has failed to reach even essential primary healthcare to the deprived sections, has not built-in safeguards to prevent abuse of the injectible (Balasubrahmanyam, op.cit, p.19).

If injectible contraceptives is to be introduced in FP programme it would mean that women be carefully screened before they are given the injection. (Health for the Million, op.cit, p.11). There are certain preconditions which should be fulfilled before administering the ICs.

- The timing of the initial injection is very important: i.e. it should be given during the first five days of the menstrual period. This is to avoid administering the contraceptive during an early, still undiagnosed pregnancy. The implication is that the mass 'camp' technique cannot be safely employed because the correct-menstrual timing is bound to vary for different potential accepters, who should not be lined up to 'got their shots' in an effort to meet targets. (Balasubrahmanyam, 1984, p.371; Health for the Million, op.cit, p.11; Satyamala and Malini, 1986, p.1080).

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- Rules for phase III NET EN two monthly trials conducted by ICMR specified that women being recruited should not be breast-feeding their children.

- ICs has a number contraindications ranging from liver disease including a history of jaundice in pregnancy or jaundice in last six months and congenital impairment of liver functions, known or suspected breast-malignancy; undiagnosed vaginal bleeding; known or suspected genital malignancy or uterine maoma; suspended pregnancy cardiovascular disturbance including myocardial infarction thromboembolic disorders; less than 8 gram % of haemoglobin; - should not be given injectible contraceptives. (Das and Sarkar, 1985, p.1714; Savvy, op.cit, p.64, Balasubramanyan, 1985, p.49; Sadasivam, op.cit, p.1886; Prabeen, Kalpana, Malini and Satyamala, 1986, p.1473).

- The WHO booklet gives a detailed list of contra-indications to the use of ICs as well as special problems which may require medical assistance, which means that women on the injectible need the support of adequate back-up health care services so as to screen out women at risk. (Balasubramanyan, 1984, p.371.).

- The Health Ministry's guidelines for the mode of administration state that the NET EN, being an oily viscous solution should be aspirated carefully into the syringe to ensure full use and avoid leakage, and that the vital containing the drug should be warmed before injection if it has been stored in low temperature (Sadasivam, op.cit, p.1987). Also, if the drug is not injected deep in-to the

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muscle or if the injection site is massaged, release from the injection site may be accelerated, and the period of contraceptive efficacy shortened. (Population Report, 1983; p.26). Surprised by the higher method failures in their phase III clinical trial even ICMR states, "certain difficulties in administering the drug, such as the leakage of NET EN solution from the syringe, was reported in general and specifically from the centres where maximum pregnancies were reported." (ICMR Report, p.8).

Apart from the callous disregard exhibited by medical and paramedical staff, hardly surprising in a target - obsessive culture, it is the inherent weaknesses of our public health system that puts to question the introduction of hormonal contraceptives as a mass programme. Can our PHCs be expected to take reasonable safeguards for the thousands of women in the target group who will be induced to use NET EN? (Sadasivam, op.cit, p.1837). At the primary health centres, they don't have the facilities to check all contraindications to the NET EN, and if you donot have the facilities how can you ensure that you avoid giving it to those particular women? And if there are no good supportive health services, how can side effects be repaired? They are introducing this to a population that has low nutritional status and low social and health status. (Padma Prakesh's views quoted in Savvy, 1986, p.64). Moreover, recently wrong administration of the drug, faulty storage and negligence by doctors and para-medical staff were responsible for the vaccine deaths at Bombay, Gujarat and Varanasi. These are vital factors that have to be

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taken cognisance of before ICs are introduced in a mass programme. Added to these is the disquieting scope for misuse of an injectible method. Given the low response to IUDs and oral pills, injectables are being welcomed as a workable tool by government officials and medical staff afflicted with 'targetitis' who are propagating the theory that "an injection is a good solution", on the basis of biased and incomplete information to women.

An ICMR study on 2,600 women during the early '80s showed a dropout rate of 68 percent at the end of 24 months. Of these 40 percent discontinued because of menstrual disturbance. (Balasubrahmanyam, 1984, p.46). Currently, the ICMR is conducting phase IV (the last stage before a drug is approved for marketing) with NET EN. This is being done even though the interim report on 3100 women who had enrolled for the phase III trial (NET EN-II) showed that in 90 percent of the cases the participants had complained of abnormal menstrual cycles, headaches, weight gain, depression, hypertension, decreased libido and abnormal distention (Health for the Million, op.cit, p.11). The adverse side effects of the injectable contraceptives is as follows:-

I. Impact on the menstrual cycle:- NET-EN (the recommended dose is 200 mg. every 60 days) is injected into the gluteal muscles (buttocks). It totally disturbs the natural hormonal balance of the body resulting in a major disruption in the menstrual cycle -

- 1) The occurrence of heavy and prolonged bleeding which is one of the side-effects often reported. (Balasubrahmanyam

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1984, p.371, 1985, p.19, Satyamala and Nalini, op.cit, p.1079). Women experiencing this side-effect need to be evaluated for anemia and if necessary should received therapy for both abnormal bleeding and for anemia.

(Balasubrahmanyam, 1984, op.cit).

2) Amenorrhoea - Total lack of menstruation was the most common complaint. The women complained a weight gain and lethargy which they believed was due to "bad-blood" accumulating in the body. (Kapil, 1986, p.671). In fact, to the extent that they reduce blood loss they may reduce the risk of anemia". This might sound like simple common sense - if women donot bleed monthly then they must be saving on their iron stones. But in reality, the underlying reason for amenorrhoea is endometrial atrophy, the reversibility of which is still unknown (Praben, Kalpana, Nalini and Satyamala, op.cit, p.1473).

3) Spotting of blood irregularly throughout the month is also reported. This is less common than amenorrhoea but its effects are psychologically serious. The spotting was taken to be like menstruation. A traditional belief holds that the period of the menses is an "unclear" time and, in some orthodox communities, a menstruating woman may not cook for her family or take part in religious activities. Most important a common folk belief is that if a man has sexual intercourse with a menstruating woman, he will somehow suffer a "poisoning of the blood". Constant and unscheduled spotting made the woman vulnerable to the husband's wrath and this was a cause of discontinuation of

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of the injectible (Kapil, 1986, p.672).

4. Irregular periods which start without warning at inconvenient time and give rise to the same problems as in case of spotting of blood irregularly. (Ibid). The trials conducted by the ICMR established that NET EN led to bleeding irregularities in 25-30 percent of the users. (Sarin, op.cit, p.18).

5. Intermittent bleeding has also been reported by using ICs. It is usually associated with the rigors of travel or heavy physical work. Since the village women are usually anemic and do heavy agricultural labour, their health is affected by the loss of blood. (Kapil, op.cit, p.672).

II. Return of Fertility after discontinuation - Although there is no data on whether women who have been on ICs for two or three years can conceive after discontinuation, the government is recommending it as a spacing method (Sadasivam, op.cit, p.1886; Health for the Millions, op.cit, p.11; Balasubrahmanyam, 1984, p. 371). They say that after the effect wears off, ovaluation proceeds normally in six months or a year. But if ovaluation has started it does not necessarily mean that the women will conceive and there is no study to prove successful conception after the ICs effect wears off. This is dangerous because this is not a technical method. (Savvy, op.cit, p.65). Therefore, the World Health Organisation (WHO), though a proponent of NET EN, has advised against its use on women who have not had any children. (Sadasivam, op.cit).

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III. Impact on various metabolic functions - In its twelfth annual report, WHO admits that adequate research has not been done to determine the effects of ICs on metabolism. (Sarin, op.cit, p.18) Balasubrahmanyam, op.cit, p.371; Sathyamala and Nalini, op.cit, p.1079; Population Report, 1983, p.25). The rate of decline of circulating norethisterone in patients having multiple injections was significantly slower, suggesting a decline in the metabolism of the steroid. The nature of this alternation in metabolism is obscure. It is not known after how long the change to a slower metabolism occurs. (Contraception, 1978).

IV. Weight gain - Dr. Hari John of the Deenabandu Medical Mission in Madras has introduced Depo-Provera in 1976. He found that weight gain has occurred in 45 of 763 couples. The doctors attributes this to absence of blood loss and the loss of fear of getting pregnant with a resultant happy frame of mind and better eating. Lack of menstrual periods also increases the number of working days and therefore, the family's income and food. (John, 1982). But the 'weight gain' with the ICs is a pathological condition. In other words it is a diseased state. Woman 'gains' weight in toxæmia of pregnancy, cushing's disease and diabetes also, but no physician (in his/her right mind) would recommend the weight gain in such condition as a remedy for underweight. (Kapil, op.cit, p.1474).

V. Exposure of foetuses and infants via breast milk:-

When a breast-feeding woman uses any hormone, small quantities of the drug pass into breast milk and is consumed by the infant or foetus whether the infant will suffer any long-term ill effects is unknown and is being studied. (Population Report, 1983, p.31; Balasubrahmanyam, op.cit, p.371;

Sarin, op.cit, p.18).

A study in this case would have to <sup>go</sup> on until the child reaches puberty, because hormonal effects would be manifest at puberty. So a) such long term studies have not been conducted and b) if such studies are shown to be harmful after 15 years, who is responsible for the whole generation of children that will suffer from the side effects? (Manisha Gupte in Savvy, 1986, p.65).

VI) Abnormal Secretion of milk - The drug use was not approved in the United States but available in developing countries. In Chile it has been found that numerous women who have had Depo-Provera have been left with prolonged galactorrhoea (abnormal secretion of milk), in some cases for as long as nine years after the last injection (Prabeen, Kalpana, Nalini, Savita and Sathyamala, op.cit, p.1473).

VII) Cancer causing effects - Animal studies have so far shown increased risk of pituitary and breast cancer in rats and endometrial cancer in monkeys poses a definite risk of similar problems in women. (Health for the Millions, op.cit, p.11). The drug's potential long-term cancer-causing effects are, as yet, unknown. (Balasubrahmanyam, 1984, p.371; 1985, p.19; WHO 13th Annual Report, 1984; p.10; Padma Prakesh in Savvy, 1986, p.64). This is the main reason why the drug is not approved for general contraceptive use in Western countries.

VIII) Permanent sterility - It is found more often in older women and sometimes in younger women, as revealed by Dr. Hari John who introduces Depo-Provera in 1976 (Kapil, op.cit, p.671).

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IX) Aches and Pains in Joints - This was a constant complaint of about half the acceptors (as revealed by Dr. Hari John's study). The doctors explain it but wondered if it might be due to retention of water. (John, 1982).

X) Effect on Infant's sexual development - ICs can pose a very definite threat to women who use it as a contraceptive, failure to detect early pregnancy at the time of administering the drug, and a residual effect in women who conceive soon after discontinuing it and through breast milk. It is feared that the drug could create birth defects in such children as well as late sexual development especially in females at puberty (Health for the Millions, op.cit, p.11; Population Report, 1983, p.31).

XI) Immuno-Suppressive effect - other important aspects such as the immuno-suppressive effect of the IC on the woman and her breast fed infant, the possibility of irreversible pituitary ovarian and endometrial atrophy have not been studied (WHO Technical Report Seves, 1985, p.26).

Above are the possible adverse side-effects of the ICs. But women were just told that it was an injection to prevent having children. They were not informed about the side effects or the fact that it was being tested on them. It is not just a social issue but also a question of medical ethics

Women cannot forget the IC they can't forget' the pill nor throw it away if they cannot tolerate its side effects, nor can it be pulled out like the IUCD when it causes infection and bleeding. (Prabeen, Kalpana, Savita, Nalini and Satyamala, op.cit, p.1474). This contraceptive has a high potential for misuse and can recreate the family planning scene of the emergency era (Sadasivam, op.cit, p.1886).

Other spacing methods such as subcutaneous implants, antifertility vaccines are being tested in India. These methods are potentially far more hazardous than NET-EN. By focussing on NET EN, which is the first one of the series of the hazardous contraceptive, it is necessary to highlight the dangers and potentials for abuse of all such methods. (Prabeen, Kalpana, Sarika, Nalini and Sathyamala, op.cit). The extremely relevant questions are: who are the women being experimented upon? How much information are they being given to persuade them to 'volunteer'? Are they even aware that these are experiments?

While trying to realise birth control targets through large-scale use of ICs, the government is apparently oblivious to the fact that contraceptive technology is in the hands of multinationals who are competing with one another in production and trying to fob off on the Third World what they would not use themselves. (Sadasivam, op.cit, p.1887). The promotion of NET EN will not serve the interests of Indian women, but will only go to boost the profits of the West German multinational drug firm, Schering AG (Balasubrahmanyam, op.cit, p.19). According to Dr. C.D. Shetty, a physician, "we will never be able to tackle the complications that could arise from its countrywide use." (Sarin, op.cit, p.18). As Vibhuti Patel argues that - "Third World women are not exalted guinea pigs. We don't want any contraceptive that doesnot allow us to have control over our bodies. If they want to do research, why should it be done on Indian women? Why can't it be done on the

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foreign women? (Patel in her interview ed. in Savvy, 1986, p.65).

ICs are used on a healthy population, so it is more unethical and inhuman to create iatrogenic problems (doctor or medicine-induced problems) and to then give further unsafe hormonal preparations to counter this effect. Instead of questioning the safety of the former, doctors dump more unsafe preparations on the woman. The manufacturer's interest also becomes more pronounced. The market is unlimited since it includes all healthy women.

The drug companies, the medical profession and the policy-makers are governed with a male-oriented view. We women are seen at stereotypes. Our menstrual problems are decided by them as psychosomatic. We are full human beings capable of thinking intelligently and we should challenge them at the various levels, at the policy levels as to who decides what kind of contraceptives should be used. Is it us, is it the government or the international funding agency, or the drug companies that are going to decide how many children we should have and what contraception we should use? (Manisha Gupte in her interview in Savvy, 1986, p.65).

E. Synthetic Sex Hormones

Harmonal preparations comprising two synthetic sex hormones, Oestrogen and progesterone, are being marketed under 15 brand names by a dozen pharmaceutical companies and are used by an estimated 1,80,000 women every year in India. In the West they came into use for diagnosing pregnancy in the '50s, after Dr. Bernhard Zonek demonstrated their utility for correcting delay in the Onset of menstruation. Since delayed menstruation is an indication of pregnancy, the inability of the synthetic hormone preparation to re-establish menstruation is inferred as a confirmation of pregnancy.

These Oestrogen - progesterone (EP) preparations stimulate in the body conditions normally obtained at the onset of menstruation. The intake of these synthetic hormones artificially raises their level in the body. When the intake is discontinued (as happens with the end of the prescribed course) the abrupt drop in levels of the hormone triggers 'breakthrough' bleeding. However, if conception has occurred it is assumed that bleeding will not occur. That is, if the treatment of amenorrhoea with this preparation fails, pregnancy is diagnosed. (Prakesh, 1982, p.1404).

In the '70s increasing information about the effects of the ingestion of synthetic sex hormones in early pregnancy forced many countries to put a ban on their use for diagnosing pregnancy. It was found that the drug acts by altering the maternal hormonal balance. Since, this obviously affects the non-pregnant uterus it is more

than likely to have some effect on the foetus in a pregnant uterus (Ibid). No medical text book today recommends this use. Such eminent tomes as William's Obstetrics and Goodman - Gillman's textbook of Pharmacology have both strongly discouraged the use of hormonal pregnancy tests. And the WHO Scientific group in 1981 stated that these tests should no longer be used (Prakesh, 1987, p.45) Now the harmful consequences of synthetic sex hormones is very much an open question.

#### Reliability of the test -

In 1975, a study was reported in the International Journal of Gynaecology and Obstetrics by Dr. Vengadea Salam about reliability of the test in diagnosing pregnancy. It was seen that more than 18 per cent of 'pregnancies' the test diagnosed turned out to be false, thus in fact delaying the diagnosis of other, perhaps more serious, reasons for delayed onset of periods.

In short, the hormonal pregnancy tests are indifferently effective in diagnosing pregnancy, potentially hazardous, misleading, and are often misused. (Op.cit, p.1404).

#### Effects of the Sex Hormone Test on Women -

In the '60s research studies and surveys of babies with certain 'congenital malformations' showed that a significant number of mothers concerned had been exposed to synthetic sex hormones during early pregnancy. This exposure could have been simply because of a failure to discontinue the use of oral contraceptives (which contain sex hormone), or they could have been exposed to these hormones either in the form of drugs to prevent threatened abortion or through hormonal 'pregnancy tests'.

A 1974 study of congenital limb reduction defects, i.e. without an arm, leg, or fingers and toes, confirmed a positive association between maternal ingestion of sex hormones in early pregnancy and such deformities. Another study (quoted in an authoritative article in the Influential 'Nature' in '72) of 100 mothers of Spina bifida cases which took care to eliminate mothers with predisposing foetus from the sample, also found a similar association. In 1975, two members of the Committee on Safety of Medicines, UK, quoted in the British Medical Journal a conclusive study on 149 abnormal babies with malformations of the central nervous system, reduction deformities, Down's Syndrome and other malformations conducted with 149 'controls'. They found 23 mothers of abnormal babies had been exposed to sex hormones in early pregnancy compared with only eight of the 'controls'. Researchers also found that the ingestion of these hormones showed some association with VACTERL anomalies. VACTERL is an acronym that came into use to describe the vertebral, anal, cardiac, tracheoesophageal, renal and limb anomalies which were a characteristic feature of the thalidomide babies, although the pattern is different here (IBID).

In India it was estimated in 1979 that more than 1,80,000 women were being prescribed and sold this pregnancy test every year without any warning of its potential hazards. And this despite the fact that it was well known by then that there was a definite association between congenital malformations and the use of hormones by mothers

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during early pregnancy. In fact, a 1976 study in Madras of 52 mothers who had given birth to children with congenital malformations had found that 31 percent had taken hormonal preparations in the first few months of pregnancy.

(Prakesh, 1987, p.44).

Recently a case study report of a female child by Dr. A.R. Patwardhan of Arogya Dakshata Mandal, Pune. The mother of the child Shubhangi Kailas, born in May 1974, took the E.P. combination in the early days of her pregnancy to postpone menstruation for religious purposes. All her children were normal but Shubhangi was born with limb defects and a congenital heart. Dr. Patwardhan reports that the E.P. forte tablets were prescribed by a qualified gynaecologist for postponement of menstruation on having confirmed the pregnancy. The pregnancy was not terminated but there were malformations in the female child. He argued for the ban of the E.P. Forte formulations in view of the hazardous side effects.

Dr. Mridula Phadke, professor and head of the department of genetic centre and perediatric department of B.J. Medical College and Sassoon General Government Hospital, Pune, in a period of a year, found 6 cases of congenital malformations caused by intra-uterine exposure of E.P. combination taken by the mothers during early pregnancy (The Times of India, 1987, p.4).

Some experts believe that maternal exposure to EP preparations could lead to the appearance of uterine cancer if the foetus is female (Prakesh, op.cit, p.1404).

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Even apart from these effects, the hormonal pregnancy test can cause unwanted abortions. This has been reported in 7-10 percent of the cases, and is the basis for its mistaken use as an abortion expedient - a myth, incidently, encouraged by some doctors (Ibid).

To day 15 major brands <sup>(1)</sup> of the drug are being sold on the market and the only warning of the risks involved in using it, is a 'warning note' in English printed in small type that the drug should not be used as a pregnancy test. And even this has been introduced only since 1982 because of pressure from people's health groups.

Why then are these drugs allowed to be manufactured and sold in the country? Drug manufacturers contend that just be - cause a drug is misused - despite the 'warning' on the packages - is no reason why it should be banned. According to them and some experts, the drug is indispensable in treating menstrual problems such as secondary amenorrhoea, (missed periods for reasons other than pregnancy) and a variety of gynaecological disorders like <sup>poly-</sup>menorrhoea, endometriosis, dysfunctional uterine bleeding.

Interestingly however, none of the gynaecological text-books recommended the use of high dose combination of

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(1) The best-known brands of EP drugs (both injections and tablets) available:

1. Menstrogen Infar
2. Orgaluten Infar
3. Orasecyon Forte Nichols;
4. Disecyon Forte Nichols
5. EP Forte Unichem;
6. Lut Estroton Forte Mac
7. Primoult N German Remedies;
8. Voldys 21 Glaxo(now Glindia)
9. Oesterone Lyka;
10. Gestapion Khandelwal
11. Doluton German Remedies.

estrogen-progesterone for these problems. Experts such as Dr. Stephen Franks, an eminent reproductive endocrinologist at St. Mary's hospital and medical school in London point out that there is no justification for treating these specific cause determined before any treatment is recommended. In India, for instance, the most common cause of secondary amenorrhoea may be anemia or tuberculosis. And menstrual irregularities are often misdiagnosed as such. What may be irregular with reference to the general pattern may be quite normal for the individual woman. And even if it is necessary to treat the condition with hormones, low dose estrogen-progesterone (contraceptive pills) or progesterone alone is to be preferred (Prakesh, 1987, p.45).

In 1982, on the recommendations of the ICMR, the drug was banned in India by the drug controller but the manufacturers got a stay order from the Courts. (Times of India, op.cit). High dose EP drugs account for \$ 17 million from world wide sales every year, and the largest market is Third World countries. According to the Health Action International just one product, organon's Menstrogen alone accounts for 17 percent of the profits. But should the drug authorities jeopardise the life and health of future generations, especially after similar tragedies have occurred in the world, just to ensure that this market, for EP drugs remains intact? (Prakesh, 1987, p.46).

This issue also brings into focus how the availability of mediocre production of doubtful reliability can act as a damper to the further development and

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manufacture of alternative means, perhaps more reliable and certainly less dangerous and expensive. At present there are hardly any pregnancy tests which are available everywhere and cheaply. Testing for pregnancy is necessary generally only when an abortion is sought. This fact is usually never mentioned by doctors in clinics or hospitals. when an abortion is needed, there are other means of diagnosis, because women, who in addition to dealing with the psychological and physical problem of bringing up a malformed child, have also to face the social stigma of having borne an abnormal child.

### Hymenoplasty

The word 'virginity' has a distinct female association though it applies equally to males. Besides, it is taken to be a positive quality in a human female to be and remain a virgin till the husband consummates the marriage and 'deflowers' (sic) the girl. For women and girls, there is positive and physical proof for virginity which is built into their bodies. For men, however, their virginity or the lack of it has to be taken at face value ---- depending on what they themselves say about their virginity. Besides, the moral standards for a man's sexual behaviour are diametrically opposite to that of females as determined by most societies in the world from the days of yore.

What is the physical proof of virginity in the female's body? Do only human beings have it or do animals have it also? How far is it fool-proof? How does it affects the quality of a woman's character and the happiness of the married life of a couple? Today, with so much of advance made in medical science it is possible for a surgeon to restore a girl's virginity.

(Chatterji, 1937, p.19)

#### Is the 'Intact Hymen' a foolproof test of virginity?

The hymen is a membrane that nearly or totally closes the opening of the vagina. The vestibule of the vagina is the cleft between the labice minora into which the urethora and vagina open. The hymen vaginae lies at the opening of the vagina; it is a thin fold of mucous membrane that varies in shape. After rupture of the hymen,

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the small, rounded elevations that remain are the carunculae hymenales.

In human females, the hymen ruptures with the first act of sexual intercourse and there is bleeding and this proves that the girl was a virgin and had an intact hymen which has just been ruptured.

It is indeed ironical that virginity through an intact hymen is still taken to be the only and the most substantial proof of a girl's virginity. Girls no longer live the closeted lives within the four walls of their homes, busy in sedentary activities. In today's world, where girls are increasingly involved in hectic physical activity every day, they are likely to rupture their hymens inadvertently by resorting to perfectly innocent activities like swimming, cycling, dancing, outdoor sports and other such rigorous actions. On the other hand, some hymens nearly close the opening of the vagina. In such girls, sexual intercourse may not lead to the rupture of the hymen at all. Besides, even in some cases where the hymen totally closes the opening of the vagina, being a membrane, its flexibility will vary from one girl to another. If it is very rigid, it may rupture painfully and may cause bleeding. If it is very pliable, it may never tear even after several acts of intercourse and even when it does, there may be neither bleeding nor pain.

Thus, the hymen is no foolproof method of knowing whether a girl is really a virgin or not (Ibid, p.64).

Does the presence or absence of virginity indicate her moral quality?

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Is it likely to affect the married life of a couple if the girl is not a virgin at the time of marriage? Nevertheless, all oriental societies including the Indian one attach too much importance to the virginity factor for the woman at the time of her marriage. Although most of the doctors feel that the loss of virginity has no specific role. But as men, they feel virginity to be a necessity for the first act of coitus. As an Indian, their culture tells them that virginity denotes purity in a woman.

Indian men and women are becoming increasingly emphatic about the intactness of the hymen, for eligible unmarried girls, probably because of the alarming speed with which the urban societies are doing away with the segregation of the sexes. Girls are often indulging in premarital sex of their own volition and perhaps, even from a sense of conviction because they do not attach much importance to virginity when they get into an affair. Later, at the time of marriage, they sit up and have a rethink on the subject and are scared of the prospects of entering into the nuptial chamber without an intact hymen. (Ibid, p.64).

City doctors have hit upon an easy and money-making remedy for this - "Hymenoplasty".

#### Hymenoplasty-

Hymenoplasty, as the name suggests, is the surgical (artificial) repair of the hymen which is a membrane in the female genital tract. Through a simple surgical process,

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the ruptured hymen is repaired to cover the mouth of the vagina and restore it to its precoital normality. It is not medically unethical because it is actually correcting surgery similar to any plastic surgery for cosmopolis. Besides, it is very difficult to repeat the process. (Chatterjee, 1987,p.6).

To crown it all, the women are spearheading the process of mymenoplasty by generating a high demand for it. Mothers of eligible young girls and the young girls themselves are running to plastic surgeons and gynaecologists in Bombay and are paying through their noses to get the ruptured hymens restored in order to make them appear virgins on their wedding night. The demand for hymenoplasty cuts across barriers of caste, class, creed and colour but has one thing in common: affluence which is natural since doctors are charging of Rs. 15,000 and Rs. 20,000 for the operation.

The charges are astronomical because a) the demand is urgent; b) the doctors need to be paid for being discreet in keeping the whole thing a secret. (Ibid).

#### Effect of Hymenoplasty on women -

The basic important question is, why are these young women lending themselves to discrimination they are also fighting against? Besides, the doctors say that the method is not foolproof and "performing the operation a second time becomes difficult as the hymen becomes increasingly rigid".

However, the very fact that girls are taking recourse to hymenoplasty before marriage implies that they consider

men to be naive enough to attach so much importance to the intactness of the hymen as proof of the girl's moral character. That they are probably not aware that other activities can also rupture the hymen without the girl having engaged in premarital sex at all. It also means on the other hand, that the balance is still tilted towards the importance of male opinion on female morality in matters of arranged marriages in a society which is predominantly patriarchal in nature.

The irony about the whole concept of virginity tests on two basic factors-----one, that the technical loss of virginity----a ruptured hymen-----has been caused by sexual intercourse, then the man is also involved equally if the act is on mutual impulse, alone if the act has taken place through coercion of the female, not necessarily rape but covering rape. But the man gets away scot-free. Neither is he questioned nor is he victimised. Two, that the rupturing of the hymen is possible even without any kind of sexual communion such as swimming, dancing, athletics, besides masturbating. (Op.cit, p.64).

It is socially unethical to encourage the practice of hymenoplasty because it will lead to increased discrimination between the sexes. If the operation becomes cheaper, because of the economic theory of rising demand, will this not turn the clock of women's liberation back?

INDUSTRIAL POLLUTION (BHOPAL GAS DISASTER) ON WOMEN

The impact of any disaster, 'natural or Industrial' is felt more acutely by the socially and economically disadvantaged sections of society, among whom are 'women' (Prakash, 1985, p-2196). The 'Bhopal tragedy', a 'death chamber' where about 10,000 people died due to leakage of MIC (Methyl Iso-cyanate) from Union Carbide Plant has now become an international issue (Ranadive, 1985, p.15). In Bhopal, for instance, the very young and the very old have undoubtedly suffered the most. But what is not so readily acknowledged is that women due to their historically determined social location have suffered in significantly different ways (op.cit).

The Bhopal disaster highlights, amongst other things, the neglect of women's health. It must be remembered at times such as that of the accident in Bhopal, that women, and especially poor women, already suffer from the consequences of nutritional neglect and a heavy burden of work. Studies have now establish that malnutrition in women is a direct consequence of the low priority given to a girl child's health and nutrition in her growing years. Computation of women's work have revealed that women are burning up more energy than they are consuming. Dr. Veera Shatrugana, in her booklet "Women and Health" concludes that one consequence is that women have no energy reserves for emergencies such as illness and that their mortality rates are higher if there is an epidemic, for instance.

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The impact of the MIG gas on women in Bhopal can only be imagined given this background (Sharma, 1985).

The deteriorating health of women compounded by their social and economic disability poses a particular set of problem has received scant attention. Some issues which concern women, such as the effects of the gas(or gases) on pregnancies, became an early focus of controversy, which in the end failed to provide any help to women. Sporadic information has been available on the gynaecological and reproductive health of women other than that it has been assumed that the general health consequences of the disaster are similar in men and women. It is not surprising of-course, that a system which has long been geared to dismiss women's problems as inconsequential should hardly take note of signs of deteriorating health that women particularly are present in. However, even the one area of women's health that society regards as important, reproductive health, has not received concern or attention (Prakash OP. cit)

Effect of Bhopal Aftermath on Women:- Official surveys have confirmed that the lethal MIG gas of the Bhopal Union Carbide Plant has its most trecherous impact on women. Hundreds of women were seperated from their husbands, children and the rest of the family. Several women were kidnapped. Some were transported out of Bhopal, while some were harassed and raped. Still others have been sold into prostitution - the shattered women. (D' Gunha, 1985, p.20).

The report published in Times of India dated 24th January, 1985 notes the harmful after effects of Bhopal

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Union Carbide disaster on women which remind the same effects on women in Vietnam after the war was over<sup>1</sup>.

The report says so many complaints "has led medical circles to fear that the worst is far from over for the Survivor of MIC exposed population."

The 'living dead' both men and women were plagued with headaches, nausea, vomiting, cough and chest pain, breathlessness, fatigue, listlessness, weakness, muscle ache, complete or partial blindness or blurred vision, watering and burning eyes, skin problems, pain, heaviness and burning, in the abdomen, loss of appetite and loss of weight. Their immunological system has broken down. They were overwhelmed by anxiety and depression. Their work output has decreased. Many have had to give up their jobs and have been reduced to penury. There is no hope for them. They will die slowly, but surely. (D.Conha, op.cit).

A survey was made of over 1900 households in six of the worst affected localities and it was found that most vulnerable among the survivors were women in the reproductive age group including pregnant women. (Ranadive, op.cit).  
The Bhopal disaster has caused an epidemic of gynaecological diseases and obstertical problems such as leucorrhoea  
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1. Due to the terrible exposure to the chemical warfare - ('Agent Orange' and 'doxin', used by the American troops, the vietnamese women had given birth to deformed babies (with stunted growth of arms and legs, infants with two heads or without eyes and ears). Young women had been suffering from cancer of the uterus.

(while vaginal discharge), decreased, heavy or painful menstruation, pelvic inflammatory diseases, abortions, missed abortions, decreased foetal movements, still births and suppressed locations. This can inflict life long suffering on women and influence their future obstertical status, affecting all future pregnancies. The scientific and medical community however have not yet recognised, studied, followed up or ( ) treated (D'Gunha, op.cit , p.20).

The various studies conducted in the last two years about the impact of MIC gas on women reveals that the following:-

1. Higher Abortion Rate and Death of many Babies of Gas Victim:

In its chapter on environmental and occupational health, the book "The New Our Babies, Ourselves", points out that the fertilised egg and the foetus can react to toxins which donot harm adults in an apparent way. MIC, of-course, has harmed adults, so its impact on the foetus must form an essential part of any study. The book points that tetratogens are particularly dangerous during the first three months of pregnancy (Sharma, op.cit).

In January 1985, scientists from the Industrial Toxicology and Research Centre had suggested the possibility of brain damage, to the embryos. In early February, the Director General of the ICMR had stated that birth defects

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might become evident as the pregnancy progressed. Also the health condition of the affected pregnant women could cause any number of stressful condition for the foetus which need not necessarily have been due to toxic substances. But the medical authorities seemed to be more concerned with denying the potential toxicity of the gas than with providing help and advice. (Prakash, op.cit, p.2196). The abortion rate among MIC affected women in Bhopal has been found to be "three times higher" than the natural average. (Hindustan Times, 1986, p.13).

Figures released by the Madhya Pradesh Government from a close study of one lakh segment of the affected population, particularly of 2,245 women who are within three months of their pregnancies on the night of the gas disaster show:

- 361 women had abortions;
- 22 babies were born dead;
- 84 were premature births; and most tragically;
- 17 of the babies born alive had congenital defects which could have been caused either by oxygene deficiency in the foetus because of the mother's impaired lung capacity after becoming a victim of the gas, and any possible genetic aberrations (The Voice of the Working Women, 1985, p.22).

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Over ~~xxx~~ cases of abortions and 22 cases of still births in March, 1985, had been reported, in Sultania Zanana Hospital, Ranadive, op.cit.).

The ICMR had started a project study in 1985, under which a select group of 2,000 expectant mothers were kept under constant observation, following the gas leakage. They belonged to those areas which, according to the official survey, were among the worst-hit colonies near the carbide plant, and belonged to the low-income group. That the toxic MIC gas had an adverse effect on pregnant women was also evident from the fact that 192 abortions took place during the first month of the post-tragedy period (December, 1984) alone (Hindustan Times, 1985, p.5).

A recent state government release provides a revealing glimpse of a situation which could so easily have been avoided. A total of 2,693 pregnancies were recorded at the time of the disaster. There have been 402 abortions, 158 in the first trimester and 220 in the second trimester of the 2,210 live birth 150 were dead by November. According to the government, state prenatal mortality is 71.4/1000 live and still births. Much of the physical and psychological trauma that these women have been subjected to could have been avoided (Prakash, op.cit, p.2196).

#### Death of new born babies:-

The incidence of still births, congenital malformations, prenatal and neonatal mortality rates of babies born by the MIC affected mothers had also been "much higher" than expected. Besides, the phenomenon of the "low birth weights" of such babies was noticeable in

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many cases (Hindustan Times, 1986, P.13).

And then appears a Times of India news report dated 21st March, 1985. It reads, "First post Bhopal gas leak baby dies prematurely." A pregnant woman residing in Bhopal at the time of the Union Carbide gas leak suffered a burning sensation in the eyes and about of vomiting. She left Bhopal four days after the December 2nd-3rd tragedy. Her baby was born on the 17th March, 1985 in Bilaspur. Its skin was scorched and cracked. There were two holes in place of the eyes. Its fingers and toes were underdeveloped. It was not possible to determine the sex. The infant weighed 9 lbs. and dies within 40 hours, despite all efforts by doctors to save it. (Times of India, 1985).

A recent study by the ICMR has brought out the alarming fact that 78 babies, who were born of the gas-affected mothers in old Bhopal, died within the first week of their birth. Another 36 new-borns had the life-span of less than fortnight. (Hindustan Times, 1985, P.5).

## II. Emergence of Gynaecological diseases and obstetrical problems:-

There is ample evidence to show that the toxic gases have resulted in what is described by some experts as "an epidemic of gynecological diseases" in Bhopal. Soon after the acute and immediate affects of the disaster had diminished within the month a large number of gynaecological problems began to appear. Typically these were dismissed as minor complaints (for women's complaints) which were insignificant (Prakesh, Op.cit, p.2196).

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A detailed history and clinical examination of 55 women was conducted by Dr. Rani Bang and Dr. Mira Sadgopal in the field clinics to in two of the gas affected slums in Bhopal, three months after the gas disaster. A pelvic vaginal examination was done in 33 out of the 55 women. The study entitled, "Effects of the Bhopal disaster on women's health": an epidemic of gynaecological diseases", confirms symptoms of physical abnormalities in women, the most consistent physical abnormalities being :

- Leucorrhoea : 31 out of 33 women i.e. 94 per cent women complained of leucorrhoea. This is a vaginal discharge of typically profuse, thick, whitish-yellow, without any foul smell or local irritation. This was unlike any commonly found vaginal discharge of infective origin.
- Retroverted uterus ( backward bending) : 21 out of 33 women i.e. 64 per cent women who allowed vaginal examination indicated retroverted position of the uterus. Their uteruses were also severely restricted in mobility.

A normal uterus is mobile and usually only 10 per cent to 25 per cent of women have retroverted uteruses.

- Pelvic Inflammatory Diseases (PID) : 26 out of 33 women i.e. 79 per cent women indicated inflammation of the pelvic.

The adnexae ( i.e. structures around the uterus e.g. tubes, ovary, etc.) were palpable and tender ( painful on examination) in 25 women; only eight women had

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Impalpable and non-tender adnexae.

79 percent PID is an exceptionally high proportion, the usual in the gynaecological hospital being three percent to 10 percent. Excessive menstrual bleeding and the high proportion of fixed retroverted uteruses have most probably resulted from PID's.

Besides the troublesome symptoms, PID is dangerous because women suffering from it have a 10-fold increased risk of tubal pregnancy and around six percent to 60 percent chance of infertility.

- Cervical erosion (ulcer on cervix): Cervical erosion and or endocervicitis was found in 222 out of 333 women i.e. 67 percent women.

- Excessive menstrual bleeding: 18 out of 39 women i.e. 46 percent women had excessive menstrual bleeding, out of which 17 had it since the gas exposure. Excessive menstrual bleeding can cause severe anaemia in already malnourished slum women.

There is also decreased menstrual flow, stoppage of menstruation (women who are not pregnant) and painful menstruation. Many women also complained of a blackish menstrual flow.

- Pain in the lower abdomen: 16 out of 55 women complained of pain in the lower abdomen, all since the gas disaster/exposure.

- Suppressed Lactation: The total number of lactating women covered by the study, at the time of the gas exposure was 8 out of 14 women i.e. 57 percent women suffered from suppressed or decreased lactation by a degree of 50 to 75

percent, while six women were unaffected. The suppression of lactation in 57 percent women is extremely high. The exposure to gas, stress and drugs could be the cause for this, leading to severe malnutrition in the infants of these women.

- Vulvovaginitis. Out of 55 women, five percent women showed indications of vulvovaginitis. That is pregnancy, abortion, missed abortion, still births, foetal distress and foetal abnormalities.

The occurrence of 'missed' abortions giving evidence of intra-uterine embryonic death and foetal risk of afibrino-genemia to mothers carrying dead fetuses which were not yet aborted. Decreased movements of the foetus which could indicate foetal abnormalities or progression towards death.

However, there is no available study in the world that rules out the teratogenic effects of MIC. Medical guidelines in such circumstances state that unless a chemical or drug is definitely proved to be safe, it should not be considered harmless to the foetus.

Besides gas exposure, other factors like hypoxia (lack of oxygen), physical and mental stress, injection of strong drugs like tetracycline and cardio-steroids could have caused foetal damage in pregnant women.

One can therefore conclude that there is a significant risk of harmful effects on the fetuses of pregnant women in those areas and such pregnancies, if allowed to continue could lead to the birth of deformed or retarded babies in large numbers (D'Cunha, op.cit, p.20.21).

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Two later surveys have also found that a significantly higher proportion of women in the gas-affected areas complained of leucorrhoea and menstrual irregularities. Whatever be the medical significance or otherwise of the problem to women, they are (at the least) a source of discomfort, irritation and anxiety. Even in normal times women rarely seek help for gynaecological problems. In Bhopal, it is more likely that a large number of women have been stopped registering these complaints now. In effect even in other symptoms disappear, most women may continue to suffer from an underlying burden of 'unmentionable' health problems. This may infact have other effects (Prakash, op.cit, p.2197).

### III. Impotence of Husbands:

A high proportion of women have lost all or most of their children. There will be increased pressure on them to bear children. This situation raised a number of issues:

Firstly, there is the grave possibility that genetic damage may have occurred in the gas-affected population which will be reflected in the offsprings.

Secondly, If the woman conceive, how will the burden of a pregnancy affect their already deteriorating health?

Thirdly, the situation will give rise to many psycho-social problems especially given the fact that several studies have reported a significantly high incidence of impotence among men in the affected population and the likelihood of sterility among men and women cannot be ruled out (Prakash, op.cit, p.2197).

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The study conducted by Dr. Bang and Dr. Sadgopal revealed that two out of 48 women reported that their husbands were impotent since the gas exposure. However, the real figure could be much higher. (D'Gunha, op.cit, p.21).

III. Lower Immune Reponse:- The Industrial Toxicological Research Centre (ITRC) has studied the physiological and the psychological effects of the deadly MIC gas on the Bhopal gas victims, a year after tragedy.

The ITRC study included haematology, chest x-rays, behavioral-psychological studies, bio-chemical studies, immunocological studies, chromosomal studies and lung function tests of the 1,109 Bhopal victims. In about 39 percent of the cases, ventilatory impairment was noted, while those with restrictive pulmonary impairment accounted for 14 percent. Incidentally, more female than male were affected. (Hindu, 1985, p.7)

IV. Many of the women have had to take up work outside the home. Worksheds have been set up for providing readymade garments, leather goods, etc. and there is a move to set up electronics units. The occupational hazards associated with these jobs, however minimal by themselves, will have a heightened effect on women with a low health status. Similarly, lung complications may result in more serious complications in women, who for instance, cannot avoid being constantly exposed to smoke from chullahs. (Prakesh, op.cit, p.2197). In Kenchi Chola, the same women who complained of breathlessness, photophobia, backache, excessive bleeding during menstruation and dizzy spells could be seen, as evening fell, continuing

with their never-ending chore of fetching water from one of the few public taps in the colony. Their ill-health gave them no reprieve from their daily workload, (Sharma, 1985).

The lethal MIC gas of the Bhopal Union Carbide Plant had its most treacherous impact on women. While there is some information available, mostly through the efforts of non-government groups, on the gynaecological and reproductive health on women, no effort has been made to separately examine the general health status of gas exposure on women. Any one of the gas-related complications can give rise to life threatening situation. The report by Dr. Bang and Dr. Sadgopal states that in a talk with three gynaecologists and one professor of obstetric - gynaecology, in the hospital, all four stated that there were no gynaecological problems attributable to the disaster. They explained the large number of women complaining of gynaecological diseases as 'usual', 'psychological', or 'fake' and the gynaecological diseases in these women as 'usual' 'TB' or due to poverty and poor hygiene, refusing to accept any special situation. These then were the incredibly callous and unstudied responses of the scientific and medical community on the effects of the tragedy on women's health.

Moreover, these perceptions and responses are indicative of the sexist biases and prejudices inherent in science and medicine. Again, although science and medicine are supposed to be neutral in their approach and methodology, their

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perception of women and women's nature is the sexist stereotype of "woman", the irrational, neurotic and hysterical being". Women's health and health problems are hence wrongly and unjustly dismissed as being psychogenic in origin and fictitious and a figment of her imagination. Pain during menstruation is one such gynaecological complaint which is soft-pedalled as being psychological in origin, despite the fact that the cause of the pain is still unknown.

The present medical relief to the affected population is through polyclinics and hospitals. Their inadequate number results in mobs milling around. This deters women from availing of these facilities, as they have neither the time nor the energy to spend. The women in the slums badly wanted gynaecological care for their problems, but complained that the lady doctors in their clinics don't pay attention to their symptoms or don't examine them. As Srilatha Batliwala writes:

"Our health system is Institution based. Women have neither the time, mobility, child care facilities nor the leisure to travel long distance at great expense to seek out the services available in hospitals and health centres, often at the loss of a day's wage". (ed. in Kalpana Sharma's article: "A story of Neglect", 1985, Indian Express).

A recent newspaper report noted that there were far larger number of women in the hospital queues than men while a single such observation is not sufficient

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to draw any conclusions, it does give rise to several questions. Are women in fact suffering from more serious and chronic complications than has been realised? Are they falling ill more frequently? Will there be a comparatively higher mortality among women in the coming years?

### CONCLUSION

When we talk about the new technologies, we must recognise that we are confronted with a political problem, and not, with a scientific-technological problem. History shows that the oppression of women based on their reproductive biology has been a constant phenomenon all through the thousands of years of patriarchal rule. Thanks to international research done by women they now have extensive proof of the worldwide capitalist 'brotherhood' of science, medicine and technology. Women live in a world which is dominated by men and which represents the interests of men as a group - that is, mainly of a small western elite. Each aspect of female biology is controlled in a very collective way by science, the State and the economy and that this control guarantees the continuation of patriarchy. Women have to fulfil the functions assigned to them so that the male society can continue to exist.

Also patriarchy sees it as its 'right' to objectify and exploit women. Very often it is women's psyche which is manipulated. In many cases it is also their body. Often - as in the case of reproductive technologies - it is an insidious manipulation of all the components of women's nature, and it is this complex interaction which has to be exposed to demonstrate the full extent of women's oppression and exploitation, inherent in the so-called 'beneficial' scientific achievements.

CHAPTER III

Information Technology And the Status of Women -

Today the form and outreach of mass media have dramatically changed. The new Information and Communication technology has considerably magnified the power of media exposing millions to its messages (Sharma, 1985, p.27). Media (or, more frequently, media of mass communication) are typographic, photographic and electronic system for disseminating messages to many people at the same time. By scripting, producing and disseminating identical messages to large audiences, media substitute inexpensive one-to-many communication of indirect experience for expensive one-to-one communication of direct experience (Butler and Paisely, 1980, p.19).

Media plays a crucial role in the functioning and change of society. But the forces of change and of opposition utilise different forms of media to suit their needs. Modern technology has vastly increased the outreach of media and made its centralised control possible. As Kamla Bhasin puts it "More frightening than the direct reach of media however is the indirect influence. By gradually shaping public opinion, personal beliefs and even people's self-perceptions, media influences the process of socialisation and shapes ideology and thinking". (Bhasin, 1984). The communication media, has after all always been an integral part of society's myth making machinery - consciously or unconsciously recording, defining, channelising and reinforcing attitudes and value structures - the 'statusquo' in short. The identity of woman has been totally submerged by the

limited variety of roles she has to play out in society and on the screen. Thus the mainstream media has been reinforcing the traditional stereotype image of woman. (Desai and Patel, 1984, p.74).

In 1972, the United Nations Commission on the status of women noted that in all its efforts to promote the advancement of women, it had encountered a serious obstacle in the deep-rooted attitudes of women and men which tended to perpetuate the statusquo. The Commission also observed that those attitude were due to cultural patterns which, to a great extent, determined thoughts and feelings about women and men. These in turn were being disseminated on a vast scale as a result of technical advances in mass communication media (UN Expert Group Meeting on women and the media, 1981).

#### Portrayal of Women in different media -

1. Radio - The medium of radio which is by now easily accessible in all villages and to masses at large is an effective means of creating awareness and propagating the right attitudes, especially towards women (Velo cherry, 1984, p.50). In radio, for instance, all stations broadcast two or three times a week programmes on women in regional languages. They form 1.4 percent of total broadcasting time. Half an hour or one hour devoted to women's programmes is filled in with 60 percent for entertainment through songs, drama, skits, etc., 20 percent education and 20 percent information, songs selected are by and large on religious themes or depicting coy young women waiting to be married; plays give the message of ideal women who is a housewife and

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mother. If she is working, then surely she must be neglecting home and children ! Often in this guise of making programme light and entertaining, some of the stereotypes are reinforced. Woman is a gossip monger. She cannot hold a secret; she loves to go to 'sales' and ultimately gets duped, etc.

In short these programmes seem to be for the education of women; and focus on issues of women are limited to imparting instructions on sewing, cooking, knitting and the like. Advice is generally given as to how to become a good wife, good mother and improve one's looks. (Desai and Patel, op.cit, p.76).

## II Television -

Television today has become a significant part of the lives of several million people and it is likely to grow in importance in the years to come. This powerful medium can be used to bring about positive changes in social attitudes and behaviour patterns, in keeping with the national policy goals and objectives of social and economic development. However, if improperly used, it can have a strong negative and destructive impact on our social fabric. Values and behaviour patterns propagated through this medium are likely to strongly influence the norms of social and family interaction and relationship. (Committee on the Portrayal of women in the media, 1984, p.26).

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It is therefore essential to examine the images, the value and the ideology propagated through television and their implications especially for the status and development of women in our society.

According to the Committee on the Portrayal of Women in the media, television indicates a wide distance from our policy objectives vis-a-vis women's development. Middle class ideologies of women's roles as wives and mothers provides the underlying basis of most of the programmes. In a country where 36 percent of the agricultural work force is female, women continue to be projected as predominantly non-producers and as being marginal to national growth and development. Their primary place is seen as being within the home and this value is reflected in the content and setting of most television programmes. The plural nature of Indian culture and the diverse roles that women play is neither acknowledged nor communicated. This results in reinforcing the stereotyped images and role specifications of women, and in a unidimensional projection of their social reality.

This is revealed in its starkest form in the programmes relating to the commercial cinema on which Doordarshan heavily relies. These programmes are loaded with derogatory images of women and are usually explicitly or implicitly sexist. They play a significant role in reinforcing negative stereotypes, such as:-

- a woman's place is in the home;
- the most important and valuable asset of a woman is physical beauty,

- a woman's energies and intellect must be directed to finding the right man and in "keeping" him;
- Women are dependent, coy and submissive, they are masochistic in their response to indignities, to humiliations and even to the physical violence inflicted on them;
- the good woman is the traditional housewife, long-suffering, pious and submissive: the modern woman who asserts herself and her independence is undesirable and can never bring happiness to anybody nor find happiness herself;
- women are women's worst enemies;
- the working woman is the undesirable exception who must be brought into the marriage and to submit.

But the commercial films and the film song programmes contain long sequence with semi-clad women dancing for men either in cabaret scenes or supposedly in the rural setting. The observed rising incidence of violence towards women in real life cannot be delinked from the depiction of such sequence in many of the feature films which are so uncritically projected by Doordarshan.

The women's programme on television reveals a predominance of discussions on health and beauty, how to bring up good children; flower arrangements, care and maintenance of clothes, skin care, the safe use of gas cylinders, etc. In recent years some attention is being paid to women's employment and to problems of working women (but largely confined to middle class women) and to the issue of dowry. If the target audience is meant to be the proper women, then both the content and the

design require drastic change. The women's programme, as conducted at present, does not cater to any of these groups (Ibid, pp.27-28).

The television programmes on agriculture are almost entirely "male-dominated and oriented". There is no recognition by Doordarshan of the fact that women form 36 percent of the agricultural work force and that they play a major role in the rural economy, and in the survival of the family, particularly among the rural poor (Committee on the portrayal of women in the media, op.cit, p.29). But television presenters still begin their programmes with: "Greetings to our farmer brothers". All experts, interviewers, model farmers are men (even though women produce more than half of India's food) and after they have discussed business, rural women appear in their 'picturesque' costumes, to provide song and dance and a little entertainment. To add insult to injury, every now and again a programme deals with 'women's issues' such as nutrition, home management, etc. Because most programmes are by, about and for men, women do not feel addressed so they do not watch or listen to them. When they are interested in watching (as was found by a Delhi-based research organisation), their men often discourage them from doing so with the excuse that the programme does not contain anything for women. (Bhasin, op.cit, p.4).

While the educational policy has finally recorded the need to remove sexist biases from the educational curricula, the children's programme does not show any awareness of the need to promote the value of equality

between girls and boys. Children's programmes, need particular attention because attitudes and values are formed at an early age, and such programmes can play a significant role in breaking sex-based stereotyping.

Despite the current trend towards having more women as newsreaders, the news and current affairs programmes usually ignore women's issues. Even topical and important issues such as dowry don't jolt Doordarshan's current affairs producers out of their stupor. (Committee on the Portrayal of women in the media, op.cit, p.30).

The T.V. commercials show men in more roles than women and more often show women in family roles, women doing activities in the home and show men as beneficiaries of these activities. The settings of commercials show women inside the home and men outside the home. Also women in commercials are shown as younger than men. (Butler and Paisley, op.cit, p.93).

The Committee on the Portrayal of Women in the media found that the on-going debates on traditions, cultures and possibilities of examining traditional institutions and practices pertaining to women, especially from a scientific point of view are not reflected in Doordarshan's programmes, thus limiting such awareness only to the minority of scholars engaged in these debates.

Critical problems that have already been identified as barriers to women's equality and development as illiteracy, discrimination in access to education, health services and Employment opportunities or lack of knowledge of their legal rights and responsibilities, and lack of

information of where to go for help in case they are in trouble are not taken up at all in Doordarshan's programmes. (Committee on the Portrayal of Women in the Media, op.cit, pp.31+32.).

### III. Film Media -

The film media which is for the most popular mass media, both in rural and urban areas, has been most damaging in portraying women. Films have not only been responsible, but have also to a great extent distorted the image of woman in a society.

Women have been an essential commodity in all Indian films, yet it is only to expose their bodies and make a vulgar display of their nakedness that women are used in films. They are inevitably shown as sex objects, helpless, unintelligent, submissive (Sarkar and Philomena, op.cit, p.42). From the early days of films until the present the number and significance of roles played by women have declined. Films have mirrored and, because of their popularity, also reinforced stereotypes of women held in each decade. (Butter and Paistey, op.cit, p.47).

Among several studies of the commercial films, the most comprehensive to date has been a systematic analyses of twelve Hindi and six Gujarati films released and shown in 1976. (Phatak, 1977). Among the main findings, the following trends were found across all films; portrayal of women primarily in terms of their relationship to men; of the 46 female characters portrayed, only 12 were shown to be in gainful employment and of these 9 were in traditional

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occupations; predictions of women as overwhelmingly emotional, dependent, superstitious, timid and irrational creatures incapable of rational actions or decisions; an emphasis on marriage as the only important goal for women; the presence of double standard of morality for men and women and frequent portrayal of women's submissive acceptance of physical violence and cruelty by men. On the positive side, most women were shown as literate and some as self-confident. Overall, this and several other analysis (Anu and Joshi, 1979) find a fundamental double image of women in the Indian film, which mirrors an ambivalence noted in other cultures: She is either the 'mother' (or sister, daughter, wife) who is demure, submissive, passive, self-sacrificing; or the 'whore' who is immoral, smoke, drinks, wears trousers and is highly sexual.

In a society where rape, molestation, bride burning and other crimes on women are on the increase, it is deplorable that films are using the portrayal of such crimes to promote their business instead of using these issues to create awareness against such crimes. (Sarkar and Philomena, op.cit, p.42).

A certain emphasis on female imagery in the film in India reflects the importance of the medium as used by government agencies in the promotion of development process, such as birth control, etc.

A detailed analysis of two government films aimed at promoting family planning found a heavy sexist and

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and patriarchal bias. (Kishwar, 1979). The study found an emphasis on the importance of sons, and an under-evaluation of female children; a stress on the passive and self-sacrificing characteristics of women; and the promotion of family planning as a woman's duty to her husband and family rather than as a prelude to a potentially expanded role for herself. As Kishwar writes:

'What strikes one about this documentary (For the Love of Munna) is the cult of glorious motherhood through which the women are appealed to'.

She further asks: 'Why is it that, in this documentary, the love of a child becomes synonymous with the love of a male child, as the very title of the documentary suggests? Why is it that the male child Krishna is always used as the archetype of a precious child and never any female mythological figure?' (Kishwar, 1979).

Hundreds of religious and other films deepen people's faith in miracles, in fatalism, they encourage unscientific thinking and irrational behaviour. Their messages are antidevelopment and basically reactionary. They prescribe personal salvation through (falsely) religious deeds. This successfully diverts attention from the real issues our societies face. (Bhasin, op.cit, p.6).

#### IV. Print Media -

An analysis of Hindi periodicals over the past thirty years actually showed a decline in the discussion

of women's issues; and an almost exclusive emphasis on traditional concerns such as food, fashion and beauty. (Press Institute of India, 1975).

The weekly women's sections of two Gujarati daily newspapers were studied over a three-month period in late 1978 (Pathak, 1979), in order to assess the scope and relevance of articles published, and the relationship between topics addressed by readers and those dealt with by the editors. Several conclusions were reached. In the first place, certain problems touched on by readers - for example, the 'predicament' of the single woman, family acceptance of the educated wife - were ignored by the editors. On the contrary, the editors preferred a self-sacrificing housewife, who should be doubly self-sacrificing if she is educated. Secondly, although readers wrote reflecting articles, presenting the problems of women in day-to-day living and asking for solutions, the editors refused to comment on the practical difficulties experienced by the readers: instead, they included a fanciful story of offered consolations. Thirdly, the editors did not seem to probe any problem deeply in order to find possible explanations for offending social behaviour vis-a-vis women. Fourthly, although readers wanted to discuss the status of women in society today, there was no attempt to deal with questions such as women's movement, legal status of women, women's rights, policies concerning women and so on. The overall picture is one of a readership alive to certain issues which are being ignored in favour of a conservative and traditional smoke-screen. (Pathak, 1979).

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The women's magazines have a clearly defined role for the women and ~~also~~ foster traditional patterns of female subordination although wrapped in deceptively modern trappings. Competitiveness (within 'feminine' spheres) and consumerism are the dominantly promoted values. Half the pages in these magazines are taken up by advertisements. Of these, about 95 percent are for cosmetics, women's clothing, household goods and children's product, suggesting an ideal role for women as alluring housekeeper. Fiction dominates most of the magazines, where the necessity of deference and submission to the husband is consistently underlined. Most of the magazines repeatedly deny women's sexuality, intellectual independence and political situation.

An element of contradiction is found in most of the magazines. An antidowry article is on one page and on the next page brings out a special feature on bridal finery, stories of frustration of housewives on one hand and detailed instructions on how to do applique work and make cushion-covers on the other (Abhilasha Kumari, 198 ), p.8).

All in all, the aim of most of the magazines seems to be to daze readers into becoming passive spectators rather than to activate them. Because an active equation with readers would threaten the flimsy structure of "happy-womanhood" sought to be upheld by the magazines. The experience of too many readers would demolish this structure completely'. In fact, the survey conducted by Manushi (a woman's magazine) about reader's letters written to the

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women's magazines suggested that women are by no means completely satisfied with what the magazines offered. Criticism included complaints about the exploitation of women's bodies as a selling device, conservatism on equality issue, superficiality in analysis of social problems, irrelevance of the content to most Indian women's lives. However, the magazines paid little attention to these critiques. 'The overall attitude to readers is that they had better remain readers. Their participation is only required in entering contests, answering occasional quizzes, cutting out and following paper patterns, and solving crossword puzzles'. (Manushi Collective, 1980).

There is no real change in the attitude of media in relation to women, the media has merely adapted itself by updating the traditional image. Even books also act as an agent for promoting sexist bias in the minds of young children.

Sexism still strongly prevails in all aspects of life, and children books are no exception. People generally tend to believe that childhood is something neutral, something idyllic something free from any values and that consequently, so are children's books. But this is definitely not so. Contrary to adult's expectations, a child's world is a minor image of the value system of the adult world. There are very few, almost no, picture books which are free from any sexist values. (Madhok, 1984).

In almost all books for children, are the assumptions on which they stand, that is, male-active, positive, inventive, creative, etc., and female-static passive, helpful to others, especially males, acting as

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a mere accessory to the male, watching and following his actions. Because of that dichotomy of man outside and woman inside, in most cases it is women who appear in relation to children and stories rarely tell of father-child relationship with the changing times, the roles of mothers, of women, are also changing. But book makers - are ignoring this reality by placing books on the market based on the firm belief that it is the best for mothers to raise their own children, affirming the traditional concept that women's roles are defined as house-keeping and raising children. There are hundreds and thousands of examples of mothers who are working outside the home, leaving their children at day care centres or making use of after-school day centres; also women, ~~some~~ married or unmarried who are active in citizen's movements or in various occupational fields. How long do we have to wait to see children's books which reflect this image of strong struggling women?(Ibid).

It is disheartening to see that it from text-books to magazines, advertisements to films, radio and television, women are grossly under-represented.

Sexist advertisements are the norm with industry and advertising agencies who reap huge profits at the expense of women. A 'sexist advertisement' is one that depicts half of the human race as inferior, it is discriminatory, it degrades and humiliates one sex in relation to the other. This form of advertising has become an important tool in the perpetuation of male western culture, and it exploits

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women's sexuality and their physical appearance.

A perusal of a number of advertisements will reveal that for advertising cosmetics, clothes, dress materials, food-stuff and domestic appliances, women are mostly used. Three out of every five advertisements depict woman as engaged in cooking, washing, sewing, teaching and nursing the sick and the young. They are often portrayed as housewives, beauticians, nurses and teachers and are seldom assigned the roles of business executives, dentists, physicians, scientists or lawyers. Never are they depicted as busy, active, energetic. Infact, they are repeatedly shown as passive spectators, helpers of men, beautiful objects or showpieces (Vijayshri; 1985, p.17). Modern advertising also projects women as obsessed with cultivating the beauty of their faces and bodies. These advertisements define the characteristics of 'femaleness' in terms of glamour, coyness, fashion. To be a 'real woman' is to be 'alluring'.

While this is the case with most advertisements, there are still a few others that depict woman in positively bad taste and lack relevancy between the products advertised and the female model exhibited. Examples are not far to find. 'You can see better', goes the caption and one sees below the picture of an office boss peening down the front of his steno's dress - one wonders what the advertisement is all about? The caption is for a popular brand of tubelights and electric bulbs.

An exclusive heater is made out to be as attractive as the bare female model beside it.

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- Another model sans clothes announces that she is waiting for a particular dress material to come her way (Vijayshri, op.cit, p.17).

In advertisement of everyday commodities like blades, razors, shirtings and towels, etc. the copy invariably carries a woman, better still a semi-clad or scantily clad woman, advertising the product in a suggestive posture. Even if truck and tractor tyres are to be sold, it is found that the use of a woman is very crucial for its sale. Why should a woman be found perched a top a tough-looking tyre? Why should a woman very scantily clad be found clinging to a brand new dunlop tyre?

#### Total onus, Double Burden -

The woman is projected as a home-oriented thing buyer. In this role the entire onus of house-keeping is on her. She is portrayed as being obsessed with the smallest detail of home management. From doing something about the 'bathroom' to 'telling him to relax', 'cut down on smoking' it is evident that the woman's Sun rises and sets on her man. A very easily start is made towards role segregation, and in ad after ad little girls are pictured as home and kitchen oriented while boys are shown as carefree and adventurous. When boys and men ever share household tasks, it is purely on a temporary basis to 'help mummy'. Mothering is shown as an intrinsic facet of the feminine personality. Media images encourage obsession here also; it is suggested that mother care means spending two hours

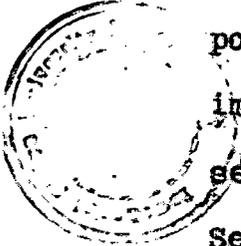
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on each of the child's meals and using the whole house as a dining room. The creativity of the agencies appears to be focused sometimes only in deceiving the women (Krishnan, 1984, p.9).

The extent of women's economic autonomy can be gauged by the things ads allow her to buy by herself, i.e., all beauty care products, clothing, washing soaps, cooking media, convenience foods, all household cleaners, kitchen gadgets. More expensive articles such as steel cupboards and foam mattresses are actually shown as being given by her father. When it comes to fridges and scooter, male approval is necessary. As far cars and TV sets, they are wholly outside the woman's signing authority. (Ibid, p.10).

The Dowry Tree - Her function as a conduit for desirable consumer articles is subtly brought out by juxtaposing images of brides with images of five-star hotels, sewing machines, worsted suiting, etc. Such messages lead to a rising spiral of expectations of what constitutes a 'decent wedding'. Such advertising is anti-social and defeats nationally stated policies while making a mockery of attempts to enforce deterrent laws. Most offensive in this regard are those banks which adjure parents to save for their son's education and daughter's wedding. (Ibid, p.11). In other words, promoting the 'dowry' menace and encouraging bridegrooms to look for father-in-law with a huge Bank Balance. Are we not inculcating the wrong values of life in a very subtle way?

The Denial of Beingness - The hospitality industry (hotels, airlines, tourist agencies) and the photographic goods industry are examples of industries where the image of women as slave is assiduously promoted.



In these ads women are shown in servile service positions, often in varying stages of undress. Such images must be seen in the larger perspectives of the sexual exploitation of women in third world countries. Selling the country means selling the country's women; how else to explain the table calendar put out by a hotel chain showing a woman for each month? True, the women were fully clad but their images in that context with pictures of historical monuments leads to a perception of women as tourist attractions.

Women in ads in these industries are so consistently projected as sex slaves that one is aware of the exposition of the "theory of non-beingness of women." Men are assisted in their "doll worship" which promotes voyeurism giving them pleasure without the discomfort of the female presence, i.e. the use of the body without the mind. (Ibid, pp.11-12).

In the National Perspective -

Images of women as household drudges or sex slaves receive ad nauseam. Strict role segregation and the double burden of the employed women effectively keep women from the main stream of national life. In turn, this renders them more prone to exploitation and suffuses

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them with a feeling of helplessness. This cultural pardah affects the training and employment opportunities open to them. On the other hand, the applause for the external person leads to increased female participation in precisely those industries where exploitation is rampant. This, in turn, legitimises such participation and leads to increasing levels of abuse. Advertising aimed at the house-bound woman generates in her feelings of underachievement and resignation as well as pathetic gratitude for any crumbs of help. They help her view, soul-destroying jobs as either heroic or her destiny. Women who do not conform to stereotypes of painted doll, tireless wife and devoted mother are made to feel unfeminine and guilty about this lack of femininity.

Of jobs and job opportunities we get a very restricted view through this medium. Women, if shown at work, are shown in subservient positions serving men rather than people as a whole, Doctors, Scientists, Managers rarely figure. Even paint boxes and dissection sets are shown as 'gender specific'. Often women are invisible. Bank ads talk of service from their man in the field to the man in the field, (when above 40% of agricultural workers are female) and tell us that the common man is the nation's wealth showing us a visual of a man. National statistics of poor nutritional and high mortality levels indicate how far women have internalised the image of the sacrificing slave (Ibid, p.12).

On a nation level when women uncritically accept images of themselves as family burden and galley slave,

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deny themselves things and opportunities in family interest, appease males by bringing them goods and displaying their bodies, we get a nation of 'appressed second-class citizens'.

The wide-spread Impact of Distorted Portrayals -

As a powerful tool in shaping ideology and opinions the urban based and urban-biased, male dominated media have perpetuated dominant ideologies and myths about women. Indian womanhood has suffered an irreparable injury because of these advertisements. The image of woman has been lowered in the eyes of the public. Such a portrayal through the mass media projects a wrong impression and reinforces the traditional 'sex-stereotypes'. It should be realised how detrimental this 'stylised' and one-sided representation of society is to the individual - especially to the women in their social development.

What impact does this kind of distortion have on the position of women in society and their development? The impact of the media is different at different levels.

I. The Perpetuation of Inequalities in the home -

Statistics tell us that women and girls are more under-nourished, underfed, uncar-ed for than men and boys. Our media provides the necessary ideology to the society (women the eternal sufferers, women the rejoicers in self-sacrifice and self-denial; women the mother-earth) to calmly accept this blatant discrimination against half its people (Bhasin, op.cit, p.6).

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The media appear to play a part in maintaining traditional beliefs by continuing to ascribe unequal responsibilities to men and women in terms of their roles as parents and members of the family. Moreover, there is some evidence that media directed at children and young people retain images which embody traditional distinctions between women's and men's emotional make-up, intellectual capacities and motivations. :

The media makes it difficult for women to break out of these prescribed roles, norms and behaviour patterns. Such conservative depictions reduce the few statements about sex equality and equal participation of women contained in the constitution to mere window dressing. The resultant conservative thinking justifies: the decisions of parents who don't educate their daughters or give them freedom, or let them take up jobs, and who discriminate between daughters and sons. Are not these real hurdles in the way of women's development? Are not these attitudes partly responsible for the lagging behind of women in literacy, education, vocational training as also for the neglect and consequent higher mortality rates of girls and of the declining sex ratio in India? (Bhasin, op.cit, p.6).

## II. Creating a distorted self-image -

Media doesnot only influence the social image of women but also their self-image. Most women are themselves uncritical consumers of anti-women media. Media affects their socialisation process, it influences their choices

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regarding what they consume and wear, how they behave, what they learn, dream, aspire to and what they ultimately become (Bhasin, Ibid, p.6).

There are lots of myths about women regarding their image which are fostered and spread through mass media. Perhaps the most important image is, in fact, a 'non-image'. Women's presence, in most media output, is typified by a few pervasive characteristics -

I) Wife and Mother: the home-orientation of women -

The portrayal of women in all mass media and advertising is still well within the traditional stereotype. (Abhilasha Kumar, op.cit., p.6). The fact that women are commonly portrayed within the confines of the home, while men tend to be seen more often in the outside world of work (Pathak, 1977). Women appear in typical female occupations - cooking, sewing, looking after the house, whether it is the advertisement or a film the image is the same. Repetitive presentation of women in domestic roles reinforces the image that the woman's place is in the home. Housewives are often shown as stupid, incapable of performing simple tasks and dependent on male advice. (Abhilasha Kumari, op.cit., p.6). Prabha Krishnan and Anita Dhige in their paper is of opinion that -

"The woman as a denizen of a happy home is the stable diet of most T.V. serials, sectoral programmes and commercials, with a myth of a home of her own being held out as a tempting promise, to achieve which she has to capture and captivate a man". (Statesman, 1986, p.4).

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The media define the male female relationship as one of female dependency and male authority.

II) The sex object and glamour girl -

One of the most deeply reactionary, and yet insidiously flattering, images which the media present of women - to themselves and to men - is that of beautiful sophisticate, or of the sexually alluring siren. These images are most clearly associated with the visual media - television, film and magazines - and are the frequent recourse of the advertising industry, working through those media. (Press Institute of India, 1975). A survey conducted in Uttar Pradesh revealed the fact that the only positive attitude towards woman was in the role of a mother or a sacrificing wife. All other roles of women as depicted in both print media and films reduced women to the level of 'mere sex objects'. (Chatterji, 1984, p. i ).

This type of image led to creation of a deep sense of inferiority, guilt and inadequacy among the so-called 'unfortunate' women, the 'plain Janes'. So they try to hide their ugliness and look like those female goddesses on the screen and in the glossy pages. For example, a CAP survey showed that factory girls who earn very low wages spend a large part of their income on clothes, cosmetics and shoes, stinting on good food at the expense of their health. Women have thus been conned into buying such packaged promises. They are made to feel that manufacturers of such glamour and happiness can actually make their wildest dreams come true.

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In the process of attaining this elusive beauty women not only compete to outdo one another in sophistication and seduction, they also lose confidence in themselves and their true worth. How this 'sexual sell' is achieved by appealing to women's self image and femaleness, is told in the words of a marketing man: 'Properly manipulated - if you are not afraid of that word - housewives can be given a sense of identity, creativity, the self realisation, even the sexual joy they lack - by buying things.'

The portrayal of women in the mass media is but a reflection, ~~which~~ albeit a distorted one, of how women are regarded in a consumer society.

The real evil of the media image of women is that it supports the sexist statusquo. In a sense, the fashion, cosmetics and 'feminine hygiene' advertisements are aimed more at men than women. They encourage men to expect women to sport all the latest trappings of sexual slavery - expectations women must fulfil if they are to survive. (Abuse of Women in the Media, 1982).

III) The Virgin-whore Dictotomy - The good-bad, virgin-whore distinction is a dichotomous stand in an enormous amount of the imagery which the media ascribe to women. Each side of the dictotomy can be expressed through a number of variations. Throughout the imagery of the 'virgin' runs a consistent stress on subordination, sacrifice and purity. The 'whore' imagery is connected with

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cruelty, inhumanity, insensitivity and unscrupulousness. These roles are propagated by the notion of rewards and punishments: if the women behaves well, she will be given the love of her man, if she behaves badly, she will be alone, unloved and castigated. (Anu and Joshi, 1979). Various anthropological studies have accounted for this in terms of an intensive male ambivalence towards women, carrying within it a fundamental fear of the potential challenge of the opposite sex. (Glazer Schuster, 1979, Lederer, 1968).

IV) The Working Woman: Power and authority -

In relation to women's actual participation in the work, all media under-present women workers (Pathak, 1977). Media always perpetuate the view that the male is in every way superior to the female, media misrepresents the roles women play. (Bhasin, op.cit, p.3).

A recent publication of the Food and Agriculture Organisation of the UN entitled Women in Agriculture states:

Of all the hours worked throughout the world, women contribute about two-thirds---women in rural areas grow atleast 50 percent of the world's food. They work in all aspects of cultivation, including planting, thinning, weeding, applying fertiliser and harvesting--- In some regions they also market what they grow. Many of them provide the main or only support for the family - in some developing regions a quarter to half of the rural households are permanently or de-facto headed by women.

One does not need more than a quick glance at our media to realise that this kind of social reality does not find a reflection in it. All farmers and most workers depicted in

the media are male. Most media reports are about male farmers and workers. These biases are found not only in the popular media, but also in educational media and development communication media, i.e. media which focussed on development issues. Analysis done of the so-called educational media like children's books, text books, adult literacy primers and even literacy primers for women shows that they are sexist, they perpetuate sex-stereotypes and almost completely negate the economic contribution of women. (Bhasin, op.cit, p.3).

Because women are not seen as agricultural producers and decision-makers, all projects are by and for men and because of this, the media only talks of men, reinforcing the view that it is only for them that plans have to be formulated. (Ibid, p.5).

There is a concentration of women portrayed as employed in a limited number of jobs and in predominantly female fields and roles. This is significant because the question of power and status of men vis-a-vis women in media portrayals relates in part to the kinds of occupational role to which each sex is predominantly assigned. Since women are rarely seen in authoritative positions such as lawyers, doctor, judge, scientist. (Culley and Bennett, 1976). They are rarely in a position to exercise direct authority over an adult male. In a study of the pattern of advising and ordering in male-female interactions Turov(1974) found that dramatic

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Characters on television were selected, occupations were assigned and plots developed in such a way to minimize the chances for women to display superiority, except in traditionally accepted female areas of knowledge. A further indication of the media's emphasis on male authority is the reliance on male voices in advertising to 'sell' products. The implication being that women depend on men for advice and assistance in the purchase and use of products, even those associated with tasks considered traditionally female.

V. Psychological characteristics : passivity, Dependency, indecisiveness - Numerous measures have been used to investigate the psychological characteristics attributed to women by the media. Consistent findings are that passivity and emotional dependence are regarded in women while in general, characteristics which are defined as 'good' in men- decisiveness, independence, forcefulness, tenacity - are defined as 'bad' in women. According to the fictional reality of the mass media, then, women are actually rewarded for ineffectuality, rather than for actively controlling their own lives (Rickel and Grant, 1979; Andersen and Korsgaard, 1978; Quiroz and Larrain 1978; Krippendorf, 1977).

Media images basically support a male-female dichotomy characterised as strong-weak, dominant-dependent, active-passive, rational-emotional, work-home in orientation. The picture of the world that emerges from the vast bulk of media output underwrites a perspective in which women are somehow 'naturally' lesser than men in stature, attribute and in their contributions to society. (Broadcasting for women's Development, 1985)

Media has therefore not only helped women and society to redefine their own and men's roles; it has also ignored, even trivialised whatever attempts women have made to redefine their roles, to create alternative behaviour patterns and life-styles. By so doing media has clearly discouraged the emergence of a new woman, a new man and a new relationship between them.

Such treatment of women by the media instead of reducing their isolation, increases it further. Instead of empowering women, it weakens them. Women remain unheard, unrepresented and more 'uncommunicable' than before. They continue to blame either their fate or themselves for their plight, often they turn to religion for their salvation. Media succeeds in depoliticising women's miseries and issues. Women's oppression remains a personal and a family matter and the misery and marginalisation continue ( Bhasin, Op.cit, PP 6-7).

### III. Reinforcing Biases In Development Plans

Media reinforces the conservative view of women and ignores their economic participation and contribution, especially that of rural women, over 50 per cent of whom are directly involved in economic activities, in addition to housework and child care. All this means that media, instead of challenging the view that women are inferior, subservient, unimportant, reinforces it and establishes man as the active force, the doer, the one who matters. Their needs and concerns, the problems they face are not articulated publicly, no public thinking and debates are

initiated on their real concerns. Because their concerns and interests remain unarticulated, women also remain neglected.

The near total silence in the media about the productive and economic role of women makes their absence in decision making and implementing bodies seem quite natural. Planning is left entirely in the hands of male, upper-class, urban planners who, in addition to their own misconceptions and conservative views on women, have the omnipresent media to (mis)inform and (mis) educate them. They have little or no commitment to women's development. Most of them see women as part of the family and believe their interests are identical with those of others in the family. According to them, it is not only unnecessary but also blasphemous to separate the interests of women because such a 'seperatist view' destroys the 'harmony' and 'peace' of the family. Needless to say, media strengthens such views.

Not surprisingly, this results on the one hand in biases in national data collection and on the other in inappropriate plans and programmes for women. It has been pointed out by a woman economist for example that 'In most third world countries, the accuracy of national level statistics which usually serve as the principal data input in the framing of development policies, is impaired by gender biases which lead to an undercounting of women in the labour force'. Using examples from several countries in her paper, she spells out the nature and sources of these biases (specially in census data), such as those stemming

from the definition of "worker", the respondents and enumerators being male, cultural perceptions regarding women's appropriate roles and the type of work that women usually do, especially its unpaid character (Agarwal, 1979).

It is obvious that such biases in data collection lead to inappropriate planning for women. Such miscalculations and misconceptions on the part of our planners and policy makers take the shape of policies and plans which determine women's lives. These misconceptions, among others, are responsible for the fact that in the mainstream plans for industry, agriculture, commerce etc., women do not figure, they figure only as a separate, small section.

In planning for rural development, it is the poor and women who have been neglected and further marginalised. Most training, information and resources for the development of agriculture, horticulture, animal husbandry are given to (better off) male farmers, inspite of the major contribution of women to these activities. All extension programmes are almost exclusively by men and for men. In the name of income generating activities women are given schemes like sewing, embroidery, papad making, which have generated little income but many myths about what is feminine and what masculine.

After three or four generations of such planning, women have been thrown out of jobs they were traditionally doing; and have been handed over jobs which are more

tedious, repetitive and back-breaking; that commercialisation of agriculture has led to increasing control of cash and family resources by men. A review of all major rural development projects in Nepal shows that because of distorted concepts of 'housewife' and 'head of household' 'economic activity' etc. the productive roles of women have been completely ignored. In most of these projects :

Women have either been left out of all the major national development projects, or included only in peripheral activities. This by-passing of women in activities which have traditionally been theirs, both as workers and as decision-makers, has led to situations where their traditional responsibilities, authority and status have been weakened or lost. In other words it has diminished their role and contribution rather than enhancing them. The corollary to this is that the development projects themselves have failed to make use of potential resources, in this case the traditional skills and expertise of women

(Pradhan and Shrestha, 1983)

#### IV. Biases in International Development Aid -

In the relatively limited areas where foreign aid has been directed to women it has been mainly in encouraging housewife-related activities. A recent FAO document entitled women in Agriculture States: 'In the past, development assistance has often failed to reach women in rural areas, both in absolute terms and relative to that of men. Such failures stem from two principal causes ; agricultural development programmes which focus primarily on the man as producers; and lack of knowledge or false assumptions about the role of women in agriculture'. (Edited in Bhasin's Op.cit , P.9)

Similarly, a study conducted by the International

Research and Training Institute for the Advancement of women shows: 'a multitude of studies demonstrate that women, as producers and providers, have often been hindered rather than helped by development programmes. Although more assistance has been directed towards women. It is predominantly of a type inappropriate to their real needs and circumstances, based as it is on a prevailing misconception that a woman's only role is that of mother and housewife and not of producer'. (New monitor for women's Progress, 1983).

One well known writer looking at development programmes in several countries shows that there is a deep-seated sexism in the workings of development agencies, especially several of the United Nations bodies. According to her: "One of the most important blocks to a development process that really helps women, is the blindness and rigidity of the planners to the needed changes, from headquarters staff to those in the field, almost all of whom are men. Because they never deal professionally with women, they have little comprehension of women's real contribution in development or even that women may have needs that differ from those of men" (Rogers, 1984).

The multi-sided neglect of women has, over time, further reinforced the image of the patriarch and his power vis-a-vis his wife and other women. The knowledge, information and power disparities between men and women have increased tremendously over the last few decades as a result of 'development' and 'modernisation' aided by male-dominated and male-oriented media.

The (media reinforced) thinking that men are the heads of household and they need jobs more than women do and that the natural vocation of women is that of mother and housewife leads to the prevalent discrimination against women in matters of recruitment and their displacement especially in times of widespread unemployment. This happens inspite of the fact that what women earn goes almost entirely for the upkeep of the family and there are a significant number of women headed households in many countries (Bhasin, op.cit. p.11).

The ownership and control of media, the domination of commercial and bureaucratic interests in the communication field and involvement of a small minority in the formulation of media policy, has meant not only propagation of values based on dominance of "class and gender" but also perpetuation of "sex biases and sex stereotypes". Women have made very little impact on either the policies or the philosophy of communication. No one will dispute that media are powerful instrument for building public opinion, however, these can also be used for distortion of social reality, as there is always an underlying philosophy supported by vertical communication by dominant groups. Those who generate and manage the information, also disseminate it selectively. Communication media have always been used by those who control them to influence the spiritual, political and intellectual development of the people - either to preserve the statusquo or as an instrument of change (Sharma, op.cit. pp-1-2).

As a sharper of ideology and public opinion, media influences society and women in a major way. It affects all aspects of women's lives including their self-image. It influences most decisions regarding women's development. Development communication emanating from mass media and administrative channels has done precious little in questioning the biases and assumptions about women's roles. Thus, it would be nothing short of tragic of women and men activists concentrated only on economic and political issues and neglected to grapple with such a powerful and insidious force such as media.

It is important that we recognise the manipulative role and "the class and gender bias of media" and that we challenge it. Instead of remaining a tool in the hands of men and the elite, media should be increasingly controlled by those who want to challenge and change the present system. Women's greater access to media technology and their role as communicators rather than consumers, will surely give media new thrust.

Women must create alternatives in different media and use them to inform and empower women to get women out of their isolation. Women must make themselves more visible and audible so that their

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concerns do not remain unarticulated and unattended. Not only must alternative messages be created but also evolve alternative methods of working together; methods which are more democratic and participatory and which break the divide between 'media makers' and 'media takers'.

CHAPTER IV

APPROPRIATE TECHNOLOGY AND THE STATUS OF WOMEN

A large proportion of the problems currently being experienced in developing countries have been caused, or at least aggravated, by a concentration on modern 'western' technologies which have been used to develop the 'modern' industrial and agricultural sectors. Any solution to these problems must be based on a correction of past trends. In particular, there is a need for increased emphasis on the development and dissemination of new types of technology which are appropriated to existing conditions in rural areas and which can be used by the majority of people to further their own development and that of their communities and nations (UN Report, 1978, p.1).

Modern, complex technologies are, for the moment, out of the economic reach of most rural communities in the Third World. There is a whole range of possible technologies which can be developed to fill the technological 'gap' between the traditional and modern technologies. Rural communities could never jump straight from step one to step ten on the technological ladder - the human, technical and financial resources are simply not available. They can, however, progress if the intermediate technologies which are appropriate to their needs and financial means are made available (Ibid, pp. 1-2).

The effect of 'intermediate or alternate or appropriate' technologies will be limited unless increased emphasis is also given to the women who, especially in the rural areas, have the major responsibility for lifting their families out of poverty (Ibid, p.2). The sex-bias in the employment is a critical factor affecting the status - economic and social - of women. The division of labour in the process of production is observed to be such that women are always placed in a disadvantageous position in the labour market. Most of the work done by women does not enter the labour market, they do most of the unpaid work but are not recognised as earning members of the family. When they enter the labour market, they are meted out with a discriminatory treatment (Hirway, 1979, 1980, 1983) and continue to be denied access to knowledge, credit, agricultural extension services, consumer and producer co-operatives, labour-saving devices and income generating activities (UN Report, op.cit. p.2).

It appears that technical changes and technological structures in economic activities are biased against women (Hirway, 1985, p.2). It is unfortunate that many of those who make a case for appropriate technology neglect the importance of women in development (UN Report, op.cit. p.2). and technical changes have not paid any specific attention towards reducing the drudgery of work or improving the productivity or expanding employment opportunities for women. Consequently women have not benefited much from the technological changes leading to economic growth (Hirway, op.cit. p.2)

### Appropriate Technology -

Women in the rural areas of the developing countries are responsible for a large proportion of the work. One policy which is now commonly advocated is to give rural women access to more 'appropriate technology' which can relieve them of many back breaking unproductive tasks on the farm and in the home and help them to increase the productivity of their labour (Carr, 1981, p.193).

An "appropriate technology" is one that is small scale rather than large scale, labour intensive rather than energy intensive, and decentralised rather than centralised, functioning on a human scale to meet human needs. Examples are solar and wind energy, gardening, aquaculture and food preservation (Smith, 1983, p.65).

E.F. Schumacher, in his book 'Small Is Beautiful' (a feminist assessment of technology) argued that modern, complex technologies are, for the moment out of the reach of most rural communities in the developing countries. At the same time, the traditional technologies which are ideally suited in the context of a subsistence economy are usually characterised by low capital and labour productivities which do not generate the surplus needed for economic growth. There is, however, a whole range of "technological gap" between these two extremes (Schumacher, 1983). The intermediate technologies offer the chance of increasing the productivity of the women's labour without requiring large financial outlays, imported materials or highly skilled labour for operating, maintaining or repairing

equipment (Carr, op.cit. p.194). Thus the Sixth Plan document has stated -

" There is greater need to develop appropriate technologies .....applicable to women .... to improve the production efficiency and reduction of drudgery in the occupations of women".

(Sixth Plan Document, 1986, , Chapter 19)

Alternate Technological Relevant to Rural women's Tasks -

There are a multitude of tasks that rural women perform and the limited tools they use in performing these tasks. The introduction of improved technologies holds out the promise of considerable benefits - not just to the women but to rural families as a whole. Varying amounts of work have been done on developing or improving technologies related to crop production and processing, water supply, fuel supply, transportation and other activities that are important in the rural environment (Carr, 1984, p.121).

For most tasks, there is now a sizeable range of technologies available as alternatives to the traditional methods. For land preparation, for example, there are improved handtools, animal drawn ploughs, power tillers and tractors. For weeding and fertiliser application, there are many devices of varying complexity and cost that can do the job more quickly and in a less back-breaking way than the traditional hand methods. For harvesting, scythes and little knapsack reapers that

are powered by small diesel engines or by solar power are alternatives to the traditional penknife. For threshing and winnowing, there are hand-operated and pedal, animal or power-driven machines that can be used instead of the time-consuming and wasteful traditional methods. In addition, there is a whole range of equipment, powered in a variety of ways, designed to grind cereals, polish cereals, shell maize, extract oil from fruits, nuts and seeds, shell groundnuts, scrape the flesh from coconuts. There is also a variety of new or improved technologies available to help with on - farm storage of crops and the preservation of surplus foods. For example, simple and cheap solar dryers have now been developed that can be used to reduce the level of moisture in crops prior to storage or to dehydrate surplus vegetables.

With respect to water supplies, there is a range of technologies that can help with the problems of collection, storage and purity of water. Wells can be drilled nearer to villages or can be dug manually on a self-help basis. Streams can be diverted and water piped to villages. Hydrants can be inserted in streams to pump water upto hillside villages. Underground catchment tanks can be built to collect and store rainwater, or water can be collected from roofs and stored in various types of container. Constant experimentation is going on to find more appropriate and cheaper materials for lining wells, constructing pipes and making storage containers.

Much work has also been done on development of water-lifting devices that are operated by hand, pedal power, wind power, solar energy, animal power, or run off engines. Such devices save considerable time and effort involved in pulling up bucket after bucket of water from a deep well. Thus, the introduction of a well and a pump to a village will automatically improve the quality of the water available for drinking. In cases where water is still collected from contaminated sources, simple water filters made from traditional clay pots and containing layers of pebbles, sand and charcoal can get rid of many of the impurities.

To help with the fuel supply problem, there are now many technologies that can reduce the amount of firewood or charcoal needed for cooking or heating purposes. Improved stoves that use only two-thirds of the amount of wood needed with the traditional 'three-stones' method of cooking can be built very simply and cheaply from mud and other locally available materials. A whole variety of solar cookers and solar ovens are available that use no source of fuel at all except the sun's rays. Solar energy can also be used for heating water for washing purposes. Yet another alternative to wood is to use methane gas for cooking or even lighting purposes. A great deal of work is being done on the development of both methane digestors and stoves and other equipment that will utilise the gas once it has been produced.

In the field of transport, there are various types of animal drawn carts, hand carts and wheel barrows that

can help women to carry more water, fuel and other commodities in less time and with less effort. There are also various developments taking place in respect of low-cost techniques of constructing rural feeder roads and bridges that can make the marketing of farm and other produce considerably easier.

To all of this, still further technologies can be added that can help rural women. Pit latrines, soak pits and sun-tables can make the women's tasks of keeping the home clean and hygienic much simpler. Low-cost refrigeration methods can enable rural health clinics - which can stock needed vaccines - to be located in fairly remote areas, thus allowing women the opportunity of giving their children adequate health care without the necessity of giving their children adequate health care without the necessity of long journeys to the nearest town. Kick wheels and improved spinning and weaving equipment can help women to produce their traditional pottery, textiles and rugs more efficiently and raise more income from such work with less effort. Improved beehives and solar dryers can open up new sources of earning income to rural women through making bee keeping and food processing activities simpler and less time-consuming. Low-cost methods of storing rainwater and simple water-lifting devices can make activities such as poultry keeping and vegetable growing possible for women who could otherwise not afford the time to collect the quantities of water involved (Carr, 1981, pp. 194-196).

### Dissemination of Alternative Technologies

There is obviously no lack of equipment designed for use in, or designed to eliminate, almost every task in which the rural women are involved every day of their lives. The fact that the equipment exists, however, is obviously not sufficient. The most common sight in rural areas continues to be that of women walking long distances with heavy loads of water, fuel or other goods on their heads and backs; and the most common sound in the villages is still the pounding of grain, which goes on and on throughout the early morning and evening. Women continue to be overburdened and overworked. Yields of food from subsistence agriculture continue to be slow. Children continue to suffer from malnutrition and lack of sufficient care and attention. Women continue to be unable to engage in income generating activities to help out with family expenses because they are fully occupied in underproductive tasks (Carr, 1984, p.123).

The obvious question is to ask why the technologies that do exist are not being utilised to any great extent by the women who are largely responsible for the pace of rural development and who are unable to quicken the pace without access to these improved technologies.

Fuel supplies - One area in which very little headway has been made at the village level is that of the introduction of improved stoves that are designed to save the amount of firewood used by the household, to reduce the amount of smoke in the home, to reduce incidences of children falling

into open fires, or a combination of all of these. These objectives seem so sensible that it is hard to believe the improved stoves would be rejected at the village level. Their rejection is often attributed to the fact the rural women are resistant to change. The available evidence, however, suggests that there are very sound reasons for rejecting many of these devices.

The solar reflective cooker, which uses no firewood at all, would seem to be of great advantage in areas where wood is becoming scarce. There are many reasons, however, why this has not been acceptable to rural women. One disadvantage is that it must be placed facing directly into the sun and has, therefore, to be constantly adjusted throughout the day as the sun moves. Another disadvantage is that only one or two small pot can be used for cooking and so a meal for a large family cannot be made using this device. In addition many of the rural women are used to cooking inside the house, and are hostile to the idea of moving their stoves into the open. Another objection is that the main meal of the day is usually made in the evening after the women return from their fields; by this time, the sun has either gone to rest or has lost most of its strength. It is somewhat unrealistic to think that rural women could change the whole time pattern of their day just to accommodate a new technological device (Carr, 1984, p.132-133).

Similarly, the proponents of the use of methane gas for cooking seem to have forgotten that production of the gas

involves the use of large quantities of water and that in many areas where wood is scarce, water is even scarcer. Women are unlikely to see the value of adopting a cooking method which substitute long walks to collect firewood with even longer walks to collect water and additionally involves collecting animal dung and mixing it with water (Carr, 1981, p197).

An improved chulha (Cooking Stove) has been developed which offered the benefits of smoke removal from the kitchen, reduction in fuel consumption and the ability to cook two things at the same time, thereby saving cooking time. In the Nada Village in Haryana, smokeless chulha was introduced in 1981. But it reflect the women's low self esteem. Their main motivation for adopting the new chulha was not to save themselves from the bad effects of smoke or to reduce the time and effort they had to spend collecting fuel. Instead, they wanted to keep their kitchens clean so that the expense of whitewashing the kitchens could be minimised. Moreover, the chulha became a 'status symbol' even for the men. In this spirit, the men agreed to pay Rs.25 to 30 that the chulha cost (Sarin, 1986, pp.28-29). But in the Sukhomajri Village in Haryana, most of the men refused to pay for the chulha. Their argument was that when the family's food could be cooked on the traditional chulha which cost nothing, where was the need to spend Rs.40 on a new type of chulha. After all, the men control the money and the benefits go mainly to the woman (Sarin, 1986, p.32).

The rural women are already heavy workloaded, they could not find even the little time required to repair their chulhas. Chulha repair requires fetching good day clay soil from the hills. They simply do not have any time to do this. As a consequence, the originally beautiful chulhas were already in a bad state of disrepair. The chimneys remained uncleaned for weeks and smoke could not go out. Disenchantment with the chulha had set in. The women complained that they did not know how to repair the new chulha properly. They found cleaning the chimney periodically a nuisance. This was not required with the traditional chulha. But as no local woman had learnt the skill fully, and none was willing to take up the work of building chulhas, the Sukhomajri chulhas were not viable in the long run (Sarin, 1986, p.29).

The smokeless chulha scheme in villages under Sidur Panchayat has become unpopular with the villagers. The chulhas were installed in the huts from which asbestos pipe with a small chimney went out of a hole in the tiled roof. But as in many cases the hole in the roof had not been plugged with cement, water entered the huts following the first rains. In several instances the damper which would have controlled the air supply was not fixed with the chulha. As a result, chulha consumes more firewood. One of the aims of the installation of the chulhas was that it would consume less fuel. Faulty installation of the chulhas have proved to be less effective because half of the smoke remained inside the house (Indian Express, 1987, p.5).

The Department of Non-conventional Energy Sources started

introducing such improved chulhas on a 100 per cent subsidy basis all over the country in late 1983. But its programme ended up shifting the focus from women to men as decision makers in adopting the new chulhas. The men could see the benefit of getting 10 feet long free asbestos cement pipes for chulhas which they could later use for drainage or irrigation (Sarin, 1986, p.32).

Thus in many cases the half-hearted effort has resulted in either dismantling of the chulhas or letting it remain like show pieces.

The community gobar gas plant, financed by UNICEF, was installed in Sadiqpara in Etawah District in 1979 for cooking gas and slurry, house-lighting facilities, tubewell facilities, flour mills. But gradually, a majority of villagers had opted out in favour of traditional methods of making dung cakes and grinding flour at home. The maximum problems were faced by the village women in their cooking activity. Ill-planning and a total disregard to women's role as economic producers is reflected in the rigid imposition of cooking timings which are incongruous in a rural set up where a majority of the women are agricultural workers. The women complained that the two hours fixed for cooking in the morning and evening were unsuitable. The morning hours particularly did not suit women who were by then well advanced in their day's activity in the fields by 8 a.m. and found it very difficult now to organise their agricultural activity in accordance with the gas provision timings. The timings were insufficient

as well. Besides, three meals are cooked in a day, and no gas provisions had been made for the third meal. Gobar gas had failed to reduce the working time and drudgery of the cooking process of the inhabitants of sadiqपुरा. The women were constrained to make dung cakes now, a fuel so essential for cooking dal and boiling milk. They were forced to rely increasingly on wood which is expensive and difficult to procure.

The introduction of gobar gas technology in their village has not reduced their time spent on cooking and household chores and there has been no corresponding release of time for gainful economic activities or for other activities including leisure (Kelkar, Malhans and Sanghera, 1981, pp. 312-313).

II. Crop production and crop processing - Another area in which little headway has been made is in the dissemination of equipment for weeding, applying fertilisers and harvesting, even though many devices have been developed that could help with these operations.

According to the UN Report, rural development schemes have drawn men into technical extension programmes that have provided the knowledge and skill necessary to use new techniques and into co-operative and credit schemes to loan men the money to acquire these new techniques. The introduction/ expansion of cash crop cultivation and export agriculture has been in large parts responsible for initiating and perpetuating a '~~sex~~ bias' in the delivery of farm related technologies. But the bias has been extended to now include off-farm economic activities as well.

Because women are associated with subsistence crops they have not been considered as needy of improved technological devices (UN Report, 1983, p.3). The assumption that the delivery of productive technologies to men ( i.e. hybrid, seeds, fertilizers, pesticides and new production methods in general) will somehow reach women be employed them equally and benefit their productive activities has not been borne out even in male-present households. Secondly, explicit attention to the needs of male farmers is translated into the introduction of techniques specific to presumed functions/responsibilities of men. The lack of an explicit recognition of agricultural work involving women reflects the absence of techniques relevant to that involvement. Thus, tractors replaced draft animals because plowing is the responsibility of men, but there was little input geared toward weeding, watering, harvesting or processing grains, all women's tasks (Ibid, p.4).

The absence of even a rudimentary perspective on the role of science and technology in improving women's situation become obvious in the 'highlight' of some ongoing and completed projects. One of them is an "electrical-cum-manual grain processor-cum-husk expeller and oil expeller" designed by the Regional Research Laboratory at Jorhat. Except for its name - the model is named 'Grihashree' - why this should be thought to have any particular significance for women is not clear. Are these machines going to be set up to provide employment for women? Or are they going to be introduced to remove the 'drudgery'

of the women who are currently employed to process grain? (EPW, 1986, p. 1482). Quite obviously the project was not designed to meet any real or felt needs of women.

The community gobar gas plant in Sadiqpura in Etawah District was supposed to provide facilities such as grinding, chaff-cutting, oil-pressing, threshing and irrigation. But these were not availed of by a majority of the village merely because they were economically weak and unable to pay for them. While the charges for the use of all the above amenities were fixed, several women accused the staff of over-charging, especially for grinding grains. Similar problems of corruption by the staff and the villagers inability to pay were encountered in the case of irrigation by tubewell, power-threshing, chaff-cutting and oil-expelling as well.

The gobar gas innovation of Sadiqpura may be interpreted as a class-related change where the decision of a powerful elite matters and the poor sections find it difficult to bear the cost of such technology imposed upon them (Kelkar, Malhans and Sanghera, 1981, p. 312-313).

III. Home Improvements - Technologies that aim simply at improving the home environment are rarely greeted with much enthusiasm. The majority of technologies in this category relate to hygiene and cleanliness which are, of course, extremely important for the health and well-being of the family but are rarely identified by low-

income families as a major need (Carr, 1984, p.137). Pit latrines and other sanitation aids are not unimportant, but they will be met with little enthusiasm at the village level while more pressing problem such as provisions of water and fuel remain unsolved (Carr, 1981, p.193).

IV. Income-generating activities - According to the UN Report, there is a critical need to promote technically efficient and potentially profitable new technologies for women, however there are points of controversy mitigating against the actual delivery of such devices. Some policy makers and planners postpone taking action in this desired direction until household labour-saving devices are sufficiently widespread to release women for productive cash earning activities. The persistent emphasis on labour-saving household devices, particularly when set as a precondition to woman's access to productive income earning techniques - sharpens the designation of women as a special target group in the technology movement and threatens to distance women even further from the production process. There may never be a sufficiently widespread distribution of labour saving devices to satisfy planners; more critically, mechanisation is already being introduced in productive areas which have traditionally been women's domain, but which now that they are mechanised are being taken over by men (UN Report, 1981, pp.4-5).

There are many ways in which appropriate technology can help to provide extra income for women in the rural

areas - both by improving the quality of the goods they are already producing and by opening up new ways of earning income. (Carr, 19 . p.137)

During the last decade it has been often suggested that rural development with decentralised planning specially in village industries is likely to improve occupational diversity of women workers. It is expected that technological changes in the village industries - implying changes in the organisation of production in these industries will encourage greater participation of women in these industries. It is argued that women have certain advantages as regards village industries as they can participate in these industries sitting at home and as they already possess some skills ( i.e. spinning, weaving, embroidery etc.) which can be used gainfully in village industries (Dharnija,1977).

The Khadi and Village Industries Commission (KVIC) offers new or improved techniques to the beneficiaries. Indira Hiraway, in her study on two industries of the KVIC Khadi work ( which includes roving, spinning and weaving) and leather work ( which covers flaying, tanning, processing and footwear manufacturing) and has found that the division of labour in these activities among males and females is such that females perform semi-skilled or unskilled work, while men mostly carry out the skilled part of the work. For example, in leather industry, women clean the leather by washing it or by removing hair, help it tanning by applying "aval's" bark etc., while men perform flaying, tanning(final operations) and are also engaged in footwear manufacturing. Again, in footwear manufacturing in Idar cutting and designing is done by men while stitching is done by women.

In the case of weaving, women are engaged in washing (soaking) the yarn, in sizing, etc. while men are engaged in actual weaving. Selection of raw-materials such as wool, colour etc., choosing designs/patterns and colour for weaving, maintaining the machinery, supervision of work etc., all are done by male workers. In other words, men manage and make decisions while women work as piece rated workers which is highly exploitative as they do not get any other benefits.

Casual kind of work (in KVIB activities) where the certainty of employment is less is mostly done by women. For example in Bardoli the unskilled casual work was done mostly by women. In the case of Idar Unit, about one third women leather workers were working as hired labourers while the same percentage for males was only 8.00.

It is believed that development of village industries in a decentralised fashion is accessible and acceptable to rural women. In this sense this is believed to be an appropriate technology for rural women. However, this so called 'appropriate technology' may not necessarily be all that appropriate after all. The KVIB contribution to women's employment is only 'marginal' in nature. The sexual division of labour in KVIB activities is not favourable to women. Consequently women's work essentially remains subordinate in nature.

It seems that even though KVIB offers new or improved techniques to the beneficiaries, the technology ( or the organisation of production) is 'male dominated'. It favours women only in a limited way.

All these indicate that introduction of improved production techniques in the activities which could be acceptable to women itself does not assure that women will be benefited by it. The benefits will depend on the way in which the production is organised (Hiraway, 1985, pp.2,5,11-12,14,18).

There are a number of income generating activities but unfortunately, many of these technologies are among those that have failed to reach the rural women.

The low rate of female participation in rural wage employment is partly due to the workload of various chores which the rural woman has to contend with, and which leave very little time for other forms of more productive employment ----- a more appropriate technology for the tasks they perform would enable them to improve the quality of their employment through saving labour (Carr, 1984, p.142).

From the above it is revealed that planners and technologists understand very little about the process of acceptance, utilisation and dissemination of improved technologies in rural areas. As a result, conditions are such that :

- the technologies that have gained a moderate foothold in the rural areas have had a very limited effect in terms of improving the well-being of all members of the community;
- the spread of many potentially beneficial technologies has been severely limited;

- A great deal of money and effort has been wasted on developing technologies that are neither acceptable nor useful to the potential end user or that do not meet a high priority need.

Reasons behind limited dissemination of Appropriate Technology - Following are the reasons why rural women are not using new improved technology on a widespread basis -

1) Although some technologies may appear to be appropriate in the eyes of the technologists and development workers, the people who expect to use them - the rural women, may not think them appropriate at all (Carr, 1981, p.198). Women, who are frequently the potential end users of the technologies, are rarely consulted by the technologists at the design stage. As a consequence, much effort is expended in designing technologies that relate to very low priority needs and have little chance of being accepted, while more pressing problems remain unsolved. This is true of most technologies ( such as water filters and pit latrines) relating to improved hygiene. Similarly, much research and development work is wasted on new technologies that are socially and culturally unacceptable to women ( as in the case of solar reflective cookers), or that in their view would make their working conditions worse rather than better.

Failure to take women into consideration has also resulted in the development of technologies that require the strength of a man to operate them, so that the women become dependent on the operator and cannot always use the equipment at the most convenient time (Carr, 1984, p.145).

II. The legacy of a sex-biased Delivery Approach - The

fact that development efforts involving technological change have created new inequalities between men and women and that technology delivery to women has not addressed their economic needs. The content of the delivery package for women has been almost exclusively oriented towards domestic needs with little input to increase productivity and income.

III. Sexual Bias In the channelling of Extension services - An

unequal channelling of extension services and key inputs is largely the result of the lack of appreciation and understanding of the complete role of women in the rural economy and society (Carr, 1984, p.149). Many improved technologies which are appropriate for rural women are not being used by them because they are denied access to them. In the great majority of cases, rural women are completely unaware of the existence of improved technologies which could help them. When information does filter down to the village level, it is usually the men who receive it, either because the extension workers are men or because it is only the men who have time to sit around at organised meetings or demonstration where such information might be given out (Carr, 1981, p.198; Boserup, 1970, p.55; Tinker, 1977, 1981). Unfortunately, these communication channels are rarely used simultaneously to inform the men about the importance of helping their wives through assisting them to acquire improved technologies.

IV. Limited access to facilities - A major factor limiting the dissemination of many improved technologies is inadequate access of women to cooperative and credit facilities. Credit and loans are less easily available to women, either because they are made against land titles, and the land is held in the men's name, or they are made through co-operative societies of which mainly men are members. Thus, women have little control over what equipment is purchased by the household or what facilities are provided in the village. Women may wish to have new technologies that would reduce the drudgery of their work or help them to earn income of their own, but they have no way of acquiring these. Men are able to acquire equipment related to women's work but they have no direct incentives to do so. This was found to be particularly important in the case of technologies relating to income generating activities for women. The reasoning behind this would seem to be that these technologies do not relate to any significant time savings to the men perceive no direct return on an investment in these in terms of diversion of female labour into work on their fields (Carr, 1984, pp.143-146; UN Report, op.cit).

Another factor limiting the impact of technological innovations is the high breakdown rate of water systems and equipments and the high incidence of equipment being left unrepaired. In many cases this is because women are given no training in the operation and maintenance of equipment. In addition, they usually have insufficient cash to pay for repairs and men are under no direct pressure to pay for these (Carr, 1984, p.143).

From the above position, it is revealed that women's involvement in traditional small scale village

industries - even when assisted by the new improved technologies, perpetuates the marginalised position of women in the rural economy. Some of new improved devices presented more than one of the following set-backs; double processing time, heavier demand of physical strength, more tedious efforts, reduced profits by changing the nature of the product. In operational terms the orientation behind the promotion of most income generation projects for women is welfare-based, the work is sporadic and isolated, more of an extension of home activities than a commitment to enterprise. The outcome perpetuates dependency instead of fostering self-sufficiency.

In addition, some circles see that giving productive technology to women is putting men out of work. Such sentiments are at the core of the present structure of technological choices: techniques are not only labour-specific but sex-specific as well, absorbing male labour and disemploying female labour in mainstream activities, relegating a special technology package to women for household chores and small scale industries. Till when will women remain a special target group? When will the sex-specific designation be reduced to open up a wider range of productive work and gainful employment for women to pursue? Steps to achieve the latter objective must be pursued with persistence, though the path will not be easy.

CONCLUSION

Technology is human knowledge applied to human needs. The ultimate goal of Science and Technology is to serve national development and to improve the well-being of humanity as a whole. Men and women in all groups of society can contribute positively to enhance the impact of science and technology on the development process. However, modern technological developments do not automatically benefit all groups of society equally. Such developments, depending on the given economic, social and cultural context in which they take place, are often seen to affect various groups in society differently. Technology can perpetuate inequality between women and men. Infact, it often makes it worse. New forms of technology, like any gift of power, tend to exacerbate inequalities. Although women have their own productive technologies. There is ample evidence that women have not benefited proportionally from technological advances that indeed they have often been harmed by the introduction of new technologies. Science and Technology are not socially neutral. They do not necessarily serve the goals of equality and development unless they are consciously designed to do so. Technology is a two-edged sword. It holds the potential for eliminating the significance of differences in muscular strength between women and men. Most women could equal a man's accomplishment on a tractor, providing both had the same training and experience. On the other hand, technology unevenly distributed can multiply small

differences in productivity between women and men. If only men are taught to use the machines or given the means to buy them or the right to use them, women are at a clear disadvantage.

The analysis of various industries such as agriculture, textiles, leather, silk, mining, handloom and bidi etc. indicated that thoughtless mechanisation in the grab of technological progress has played and is playing havoc with the employment of la-khs of workers, especially women, from the poverty households. Most of the small scale industries ( for instance, handblock printing and handloom are squeezed and shrunk causing distress to large number of workers. It is seen that whenever a new technology is being introduced, it tended to displace women w-orkers from previously held jobs to lower productivity and low wage occupations. To take example from the Textile Industry which is a very large employer of women. It is found that when a new machine is installed, the tendency on the whole was 'to substitute male worker for female worner and to keep female worker on the older and non-automatic machinery'. Even in newer industry such as Electronics which employ a large number of women workers, the dynamics of technical change continually displace women into low-skilled occupations. The introduction of new technical equipment such as automation (computerisation) entail the elimination of much clerical or book-keeping work. Such posts are frequently occupied by women, it is the female staff who are most affected by the adoption of new techniques. All this makes one wonder whether this is technological progress or mindless albeit notivated mechanisation.

Recruitment pattern has also changed dramatically in some of the industries like Textiles, Mining, Electronics, Fishing. Some mills do not accept new women workers but only young men, this phenomenon has a negative impact on the possibilities of recruiting women. For instance, in the Textiles Industry, the segmentation between women and men by function has been completed in most departments. The jobs created in the 'Free Trade Zones' are usually of lowest status, lowest paid, lowest skilled occupation with little opportunity for advancement, bad working conditions, least job security and few benefits. There is highly discriminatory employment policies in these new industries which favour very young, single and childless women between 17 and 25 years of age. After 25, a woman may be superannuated, that is, too old to be employed in stable electronics manufacturing firms.

Through various stages of the introduction of advanced or sophisticated technologies, the wage differential ( between women and men) also proportionately widens. The ostensible justification for these differences is women are generally less skilled than men or to put it in another way their skill qualities are lower than men, from which it is concluded that women are not able to carry out highly complex and technical tasks.

Due to the introduction of new technological innovations, new industries has been set up in the urban areas which attracted a number of female as well as male workers towards these industries. These women workers are

under the mercy of the labour contractors who initially recruited them, lived and worked in insanitary conditions and did not benefit from the labour laws. These migrant women workers get lesser wages and are sexually exploited. The migrant workers are in general less favourably treated in the labour market than the non-migrant.

Modern technology has led to weakening of women's authority. The 'Household Approach' in development planning reduce women's work to the status of unpaid household help and intensifies rural women's 'marginalisation' and 'pauperisation'. Women's participation in production tends to be grossly underestimated as a consequence of their non-involvement in decision making process and lack of training in the technological process.

Modernisation and technological infusion have by and large been introduced without regard for changing the rural structure. Thus land reforms, technology, extension and access to modern inputs/ loans have been explicitly 'class and gender (male) biased', which has deepened the cleavages between female and male employment and household status with modernisation. In the household subsistence agriculture, women have considerable authority and decision-making powers by virtue of their work participation. However, with the introduction of new technology and the extension of cash crops production, the roles of women changes. The household member who gains first access to the productivity package (e.g. the new technology, credit, information, bureaucratic linkages etc.) is usually the male head of the household. It act

to the detriment of the women as their decision-making powers are weakened. It tend to reduce women's work to the status of unpaid household help and intensifies 'housewification' of women workers. The direct result of this 'unequal' access between women and men is that the work input of women proportionately increases in various agricultural tasks without giving them any control on their output. What emerges from the situation is the women work longer hours in almost all rural activities with the aid of only their muscle power.

Weakening of women's power and authority is also found in the Industrial sector. Here, the women workers are subjected to close supervision by male supervisors. They have limited mobility to these ranks and their low status and positions provide them with few opportunities to develop roles that allow serious decision-making in their work environment. The concept of femininity, the attraction of women and men, comes to mean pleasing male authority.

Women workers are located in the lower level and lower skilled occupations in most of the industries like agriculture, coir, bidi, fishing, textiles, mining, leather goods, microelectronics and the newly developed industries such as electronics. The greatest number of hazardous substances are being used in these industries which cause numerous health hazards such as occupational stress, eye strain, severe migraine headaches, nausea, abortion, still births or births with defects, muscular degeneration, disease

of liver and nervous system, cardiovascular and intestinal problems, etc. It happens because effective measures are not taken which can prevent health hazards as a result of introduction of modern technology.

Technological changes has resulted into increased prosperity among certain sections of people and this prosperity has an adverse impact on women in two different ways -

Firstly, the recent increased prosperity in the wake of technological changes has resulted into increase in withdrawal of women in the family from the labour market and the increased exploitation of women labour. The poor women are inclined to share the prestige values of class and caste systems groups who do not allow their women to work outside the house. While women withdrawn from field related work they are forced to spend more time on non-field related work.

The new agrarian technology has used the feudal practices of domestication and seclusion of women for increasing capitalist relations of production in the countryside. There is a tendency towards the 'housewification' of women in the agrarian technology- the object being to help rural women become a good wife, a wise mother, a competent housewife and a responsible member of the village community.

Secondly, the increased prosperity has resulted into increase in dowry practice which is reflected in several areas of Green Revolution belt and also among the fisher community of Kerala Coast. The status of the people is expressed by the size and value of the dowries they can

afford to pay. The marriage market is one of the places where the green revolution turns into gold!

The evil of dowry is spreading like an evil in our society. As a result of it, the female child is considered a burdensome appendage. She is an economic drain. She must be exploited or dispensed with as a non-person. Because she crushes her family with marriage and dowry expenses. She must be raised from childhood-in financial and physical neglect. Her birth in many parts of the country is greeted with silence, even sorrow. Thus, even before she is born, efforts are made to eliminate her. Modern science is now being 'misused' to prevent her birth and ensure the conception of a male child. Science and technology are not 'neutral' in content. That they are determined by prevailing social structure is clearly demonstrated by sex-determination, sex pre-selection and In vitro fertilisation techniques (IVF). IVF and sex pre-selection technique are misguided effort to control the quality of human race by helping to produce the 'right sort' or babies, be they male, fair skinned or super intelligent. Amniocentesis, a technique originally designed to detect foetal defects, but grossly 'misused' to detect foetal sex and thereby for female foeticide. As a result India is the only country in the world where the ratio of men to women has been declining over the years and women in India is declared as the 'declining sex'. There are grave ethical, social and political implications underlying these tests. Such misuse of scientific

knowledge amounts to gross violation of all ethical principles, human rights and principles of equality and justice. Instead of promoting changes in social values that new obstruct women's right to equality, dignity and justice to which this nation is committed. This attempts openly to encourage and exploit existing negative attitude to female child. The blatant advocacy of such tests is in the name of reducing "economic and mental stress" on family and "keeping check over the accelerating population.

Thus, racism and eugenics, two other foundation stones of the dominant patriarchal ideology form an integral part of the new reproductive technology too.

Eugenic technology has also considered women as 'guinea pigs' for experimentation, especially the third world women belonging to poorer households. Some of harmful drugs and contraceptives like Injectable contraceptives ( Norplant, anti-FSH vaccines, Depo-Provera, NET-EN) are being experimented upon women. Women are not even informed about their adverse side effects or the fact that it was being tested on them. It is not just a social issue but also a question of medical ethics. The drug companies, the medical profession and the policy makers are governed with a male-oriented view. Women are seen as 'stereotypes'. Our menstrual problems are decided by them as 'psychosomatic'. Women are full human beings capable of thinking intelligently and they should challenge them at the various levels, at the policy levels-

as to who decides what kind of contraceptives should be used. Is it women, is it the government or the international funding agency, or the drug companies that are going to decide how many children women should have and what contraceptive one should use? Thus, Biology seems to become women's destiny once again and once again the experts ( Scientists, Technologists) are trying to 'mould' women according to their own images.

Another Eugenic technology like Hymenoplasty has also an adverse impact on women. In our patriarchal society, the intactness of the hymen is a proof of the girl's moral character, it is socially unethical to encourage this practice because it will lead to increase discrimination between the sexes. If the operation becomes cheaper, because of the economic theory of rising demand, will this not turn the clock of women's liberation back?

Another devastating effect of technology on women is a consequence of the prevailing belief that women are technically ignorant. The male dominated Information Technologies ( Mass media) have perpetuated dominant ideologies and myths about women regarding their self-image. Perhaps the most important image is a 'non-image' woman's presence in most media output: capitalizing on the misconception that women are technologically ignorant, the producers created a female character who seems naive, diminute and silly when compared to the enlightened male character who has somehow gained access to the "sacred" field of science and technology.

The near ~~total~~ silence in the media about the productive and economic roles of women makes their absence in the decision-making and implementing bodies seem quite natural. Planning is left entirely in the hands of male, upper-class, urban planners who, in addition to their own misconception and conservative views on women, have the omnipresent media to (mis) inform and (mis) educate them. As a result, in the mainstream plans for industry, agriculture, commerce etc., women do not figure, they figure only as a separate, small section.

Information Technologies has clearly discouraged the emergence of a new woman, a new man and a new relationship between them.

Rural women have been simply by-passed by the whole process of Industrialisation of which modern and imported technologies are an important part. By adopting the solution involving the use of "appropriate technologies" it has been stated that rural women will not only increase their productive capacity but could be helped to help themselves to produce goods and services for minimum needs.

Although some technologies may appear to be appropriate in the eyes of the technologists and development worker, the people who expert to use them - the rural women, may not think them appropriate at all. Women, who are frequently the potential and users of the technology, are rarely consulted by the technologists at the design stage. As a consequence, much effort is expended in designing technologies that relate to very low priority needs and have little chance of being accepted, while more pressing problems remain unsolved.

Much research and development is wasted on new technologies that are socially and culturally unacceptable to women or that in their view would make their working conditions worse rather than better.

Thus, intermediate or appropriate technology is not necessarily beneficial to women unless they are actively involved in its choice. This is because science and technology itself is not value neutral nor gender indifferent. Science and technology is a system which has been devised by men to serve the needs of men. Science and Technology exude a masculine aura - an intellectual machine for men who are brainy rather than brown. One can argue that the kind of research projects which are undertaken and supported, the problems which are considered important, the way research is conducted, the techniques and devices produced and the way these are used reflect the perspectives and values of the men who control the scientific and technological establishments. Even if the scientific method is itself gender-neutral, its application reflect an 'andocentric neutrality'. For instance, science and technology has not been applied to relieve rural women of the energy consuming chore of walking long distances to fetch drinking water, while pumpsets have been devised to meet men's needs for watering the paddy fields.

Modern technological developments do not automatically benefit all groups of society equally. They may have a negative impact on the conditions of women and their bases for economic, social and cultural contributions to the development process. The relationship between technology

and socio-economic structure is a complex one. When we talk about the new technologies, we must recognise that we are confronted with a political problem, and not, as we are being told, with a scientific-technological problem. The consequences of the unequal distribution of the costs and benefits of technological changes between the sexes can be particularly severe for women belonging to poorer households. More often than not, the problem cannot be located in the technological innovations per se since what is often inappropriate about the innovation is not its technical characteristics but the 'socio-political context' within which it is introduced. This gives the innovation its specific 'class and gender bias' and mediates the distribution of costs and benefits from its adoption. Hence, for example, the impoverishment of many rural households with the introduction of the high yield variety (HYV)- irrigation package would be traceable not to the Package in itself but to the pre-existing unequal distribution of land and of political power between rural households, which has enabled a privileged few to monopolise access to the new inputs and practice.

That it is women who often tend to lose more or gain less from a scheme than men of their class again relates less to the technical character of the scheme than to the ideology which legitimises and reinforces women's subordinate position, economically and socially both in the household and in the larger society. This subordination manifests itself in inequalities in women's

access to production resources especially land, in the roles they assume in the private and public spheres and in the sharing of the burden of work and the product and income from such work, between female and male household members. That little attention is paid and few resources allocated for developing and promoting specifically techniques suited to the poor rural women's needs relates to their lack of political and economic control and hence their inability to influence the direction of technological change in their favour.

The development of science and technology takes place within a system of social beliefs and patterns of interactions and in designing policies the framework of social beliefs and practices must be taken into account.

The following are the socio-cultural constraints to women's development -

a) Sex-segregation of work - There is an unequal division of labour between the sexes based upon sex segregation and sex-typification of jobs. Women's primary concentration in tasks related to reproduction has two main consequences -

For patriarchal society, production is men's primary concentration, women's involvement in the area of production is viewed as secondary to their reproductive activities. Hence the basis for their marginality and secondary role in production.

Secondly, as women's earnings are viewed as complementary and not as a primary source of family income. It is the basis for women's low earnings and wage discrimination.

As a result of it, women are unable to acquire skills which require time, efforts or money. Employers feel women's

w-working. Life is short anyway and do not invest in training them. This then becomes responsible for women being employed in low paid, unskilled and low status jobs. Secondly, it results in traditional distinction between women's and men's jobs and in income differentials between female and male workers. No sooner do women make advances into a particular area of paid employment than it becomes labelled as 'women's work' with lower pay than men's work, leaving better paid supervisory and managerial positions to men.

II. Lack of Educational and Training Facilities - A high illiteracy rate is one of the major obstacles preventing women from participating in active production and public life. Women are behind not only in numbers but the type of education they receive or opt for is qualitatively different from that of boys, and does little to alter the subsidiary nature of their status in the family or in the occupational structure. Education of women is, in general 'status quoist'. The phenomenon of girls going in for primarily soft courses in arts and humanities, limits their occupational choices and chances. Thus, the gender based division of labour in the patriarchal family gets recreated in the labour market and even the modern sectors of the economy get sex typed.

In many industries women are not given any chance to acquire training when a new process or machine is introduced. The majority of the women being displaced from employment as a result of technological changes are the illiterate and semi-literate workers. Women are huddled at the lowest occupational structure of the modern sector, in low skilled low paid, low prestige white-collar jobs whereas men continue

to dominate the top echelons of the professions.

III. Lack of Information on existing facilities

and programmes: Women are not properly informed of the opportunities available concerning their potential involvement in the industrialisation process or of the possibilities of improving their skill capacities to meet the needs of the country. Extension programmes tends to bypass women and donot accept them as the end users of science and technology. Women are also left out of the technology transfer programmes on the pretext of their low receptivity due to their lack of literacy and understanding. The little information and possible technology is hardly disseminated to end users.

IV - Lack of Credit availability: Women often cannot provide sufficient collateral for loans due to adjusting social legislation that keeps property in the name of husbands or father, or inheritance laws that discriminate against women. Thus, women have little control over what equipment is purchased by the household or what facilities are provided in the villages. This was found to be particularly important in the case of technology relating to income generating activities for women.

V. Lack of participation in decision-making and planning

Bodies: Women's interest are usually excluded from the decision making and planning bodies involved <sup>in</sup> the industrialisation process, with the result that project ideas developed by women for their own benefits often never reached the decision level, and that industrialisation plans with adverse effect on women might easily be approved and implemented. Hardly any technology is developed

keeping women's specifically in view. Technology appropriate for men may not be always appropriate for women even in the same field of work.

Science and Technology while operating in the above socio-cultural environment has a negative impact on the status of women, that is, on the self-perceived status ( women started considering themselves as non-working members of the society and incapable of dealing with new technological innovations, which has a detrimental impact on their decision-making power and social freedom in the family and community). Group perceived status ( due to the introduction of technological innovations, women are seen as incapable of acquiring and learning new skills and training necessary for operating new machineries. As a result of it, women are kept on the margin of power and authority structure and privileges. Thus, women are seen as 'second class citizen' and 'supplementary earning member' of the s-cociety) and objective status ( socio-cultural factors acts a hinderance on women's freedom, type of occupations and education. As a result of it, women are relegated to the low echelons of the scientific professions which reflects on illusion that women are incapable of handling new technological innovations).

Thus, application of Science and Technology for women will thus remain a far cry unless there is a clear policy directive against such biases. Introduction of 'appropriate technology' per se does not necessarily lead to liberate conditions of women. It calls for changes

in social values and norms. Technology should be developed and used in such a manner that women can use them with confidence and reduce their drudgery. This should enable them to stand independently and obtain equal status with men.

### STRATEGIES

Women workers should be brought into the technological process by identifying their needs and problems related to productivity, by participating in the choice of equipment design, development and manufacture of these technologies that are devised to enhance their income earning potential and technological should be designed with the cultural, social and economic circumstances of the potential end users in mind.

Industries with the low work participation of women should be offered special incentives to employ more women. In technical institutes special facilities should be made to encourage women to join technical training programmes so that they get jobs in modern occupations. Wherever new technology is introduced, women workers must be given training for upgradation of their skills. Special efforts should be made for women to have access to education and technical know-how, to bring women to technical institutes, into extension work and services and to involve women in vocational training courses that would train them in appropriate skills. Effective measures should be taken to protect health and safety of the workers. Special laws should be enacted and enforced to prevent health hazards as a result of the introduction of modern technology.

Though Science and Technology are moving to

equalise the position of women with that of men in the labour market and society, discrimination against women continues and in some cases increases. Hence, what is needed to solve the problems faced by women in relation to science and technology, is the social and political will, starting with its realisation in each household, to use the power and skills that science and technology has given, to women equally with men, to remove the various forms of discrimination including those in education and training, to which they are now subject. The science and technology are rooted in concrete socio cultural structure. The interaction of science and technology with different socio-cultural structures produce different effects on different classes of society and within different classes, there are also differences across gender. These 'class and gender' impacts in particular socio-cultural contexts have to be examined before a particular technology is introduced and a conscious and deliberate choice of technology with knowledge of the class and gender effects has to be made. To that effect, our call is a call for a cautious and selective approach to "Technological Choice."

So, when Science and Technology are not being used to remove discrimination but are being used to discrimination against women, let us use more Science and Technology, which in this case involves also the Social and Human Sciences, to establish that, "Gender" and "class" difference are 'man-made' and can and must be eradicated by 'men'.

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