

Human Dilemma of Technological Progress: Women, Technology and Employment

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Science and technology have continuously enlarged the frontiers of human knowledge, growth and development. The issue which keeps surfacing time and again and needs to be addressed while planning our technological future. It is desirable to be concerned only about the productivity and efficiency of our industry and agriculture without giving the same weightage to its human resource? The current discomfort with the impact of science and technology is obviously related to the pace and complexity of changes which are determined by the human, social and natural environment.

Technology is viewed as synonymous with progress and its magical charm to economic and social systems to optimise gains over short-term without also considering how to minimize human and social costs in the long run, confronts us continually. The quantitative demand of economic growth and the qualitative aspects of human development have been unable to exist together in harmony. The predicament of the 'value free technology' we face today is that the unanticipated consequences of technology have already injected seeds of disaster into human affairs. Technology choices not in harmony with the long term social objectives may generate situations which will be difficult to reverse.

A laissez-faire policy usually encourages super imposition of a modern sector on traditional societies and many of the problems are particularly tied up with the poorer classes whose traditional skills are rendered redundant by a modernizing economy. The present approach falls short in terms of increasing the capacities of the poor for skill development and greater productivity which could effectively deal with the poverty syndrome.

The weakest feature of the use of development of technology today which considered the 'engine of growth' seems to be its capacity to bring about tangible improvements in the conditions of the poor and the weakest sections of the population and reduce the incidence of poverty and unemployment and regional, class and gender inequalities. The technology policy statement particularly emphasizes that "keeping in mind the capital scare character of a developing economy it aims at ensuring that our available natural endowments, especially human resources, are optimally utilized for a continuing increase in the well being of all sections of our populations.... With emphasis on the employment of women and weaker sections of society". It further states that correct mix between mass production technologies and production by the masses should be ensured and in all sectors, the potential impact on

employment should be an important criterion in the choice of technology. However, there seems to be a frequent conflict between technology transfers and employment generation. The insistence on higher productivity without consequent adoption of a set of policies and programmes for creative use of human resource displaced in the process, creates contradictions where the most vulnerable groups become victims of the process of economic growth and technological changes. Those victims of the growth process are then addressed by the poverty alleviation programmes. This sub-strategy which is basically to compensate the poor for the absolute or relative losses which they undergo because of the growth strategy itself.

Dealing with the questions of balancing the potential of new technologies with its possible disastrous impact on the options of the poorer and the weaker sections of the population, the ILO Director General said, "There is no doubt that the new technologies offer increased opportunities for improving human welfare, working conditions and rate of economic and social progress. But are we in a position to seize those opportunities in a socially and humanly acceptable manner? Are we able to adjust our productive structures to the challenges of new technologies without placing an undue burden of adjustment on the most vulnerable groups of the population?"¹ Referring to the ILO studies on newly-emerging technologies in the Third World (Includes 17 cases studies) trying to explore the scope for the integration of micro-electronics, biotechnology, satellite technology and photo-voltaic power with traditional activities in sectors such as agriculture, rural industry and small business, he said "when traditional occupations are swept away by new technology, there is often a considerable social loss that does not enter into cost calculations. Values, knowledge, insights, skills and managerial abilities, not to mention physical facilities are rendered partially or wholly obsolete or redundant. If traditional production can be upgraded by blending new and traditional technologies while still maintain much of the substance and form of the older methods, gains in efficiency and competitiveness can be achieved without the whole scale sacrifice of human and physical resources".

Any meaningful analysis of current patterns of technological developments and specific social trends must probe not only the character of contemporary forms of production, its role within the larger social structure but also the ideological components of the socio-political environment. In the last decade, mankind's blind faith in technological progress has been questioned (debate on genetic engineering, on continued armament race and search for military superiority, on lethal weapons for welfare, growing industrial process and over exploitation of natural resources and stress on ecology and environment etc.) It is imperative that we do not discuss these issues in abstraction but strive for a greater balance between technological progress and human development options.

¹ Blanchard, F., "Technology, work and society: some pointers from ILO Research" - International Labour Review, Vol.123, 1984.

One cannot put the clock backwards and there is not escaping the technological developments but we have to deal effectively with many human problems that are inevitably involved in this transition.

The recent euphoria for 'new advanced technologies' has again revived controversy of technology vs. (un)employment particularly in a labour surplus country like India. The problem needs to be looked into carefully to work out the impact on employment situation in particular enterprises and sections, both its displacement aspects and the new opportunities which will be generated. The policy of self-reliance, the corner-stone of our Technological Policy should not be jettisoned in our enthusiasm to liberalise our import policy as the age for technological development.

At the outset I would like to make it clear that the paper is not anti-technological but presents a case in support of a more humane policy for technological development. It is the contention of this paper that instead of trying to treat the symptomatic manifestations of socio-economic peculiarities and skewed distribution of resources, skill and knowledge, through marginal and peripheral approaches we should work towards a vision of a future which is qualitatively different. Technology issues cover a wide spectrum, however, the focus of this paper is on employment related issues.

Forms of Production Organations and Technological Dualism: The Organised vs. Informal Sector

Post-independence economic developments in the country, have generated several contradictions. In the traditional system of production, the owners and the producers are same but in the formal sector the production is based on a specialized system of management and organization of production and procedures and labourers are differentiated. A complex set of historical and socio-economic factors have influenced the direction and growth of the formal and informal sectors. The uneasy co-existence of these two sectors where the formal sector has experienced increased integration of science and technology in the process of production, thus widening the technological gap between the two. "The phenomenon of technological dualism not only persists but grows because the formal sector experiences an intensive application of modern scientific knowledge and technology to the process of production. Because of the predominance of the informal sector, the modern formal sector becomes an enclaved system restricted to specified industrial activity at certain localized urban centers..... The informal/ unorganized sector remains subordinate to the formal sectors in-term so serving the vested interests of the latter".² The whole system of

² Misra, G.P. "Policy for science and technology to develop traditional industries in backward areas: problems and prospectus" in Man and Development. Vol.IV, No.1, March 1982.

technological research, education and training is restrictive due to unequal access of various sections and rally alienates artisans, petty producers, unskilled or semi-skilled workers and small and marginal farmers by accentuating division of labour between classes and sexes within occupations through distortions and destruction of local skills and techniques without building their own capacities.

The trade needs based process of industrialization which began during the colonial period took a heavy toll of indigenous industries and later technology transfer for import substituting and export promoting industries resulted in under-development of the village industries based on local skill and traditional technology.

The traditional industries which are usually artisan-based and located mostly in rural areas or semi-urban areas, are labour intensive and involved lower levels of investment, traditional technology, low levels of productivity and income. The growth of credit and marketing systems and rise of inter-mediaries in different form has resulted in pauperization of petty procedures who have been converted into agricultural labourers or work in subsistence production for very low returns. The household approach to strategies of rural development and the myth of self-employment and self-income has by implication meant maintaining these artisans at certain level of subsistence. The growth of urban informal sector is one indicator of the growing rural pauperization and ejection of rural artisans into urban markets.

The recent trend seems to be in favour of import liberalization. The Prime Minister addressing a meeting of the National Development Council recently and outlining a "strategy of work for millions" said that the country having reached watershed in industrial development, the thrust of new policy would be for "absorption of new technology, modernization, reduction of costs and greater competition". Emphasising that "our industry is trapped in out-dated technology, which inhibits the process of achieving self-reliance, he said that increasing their productivity and efficiency in a cost effective manner would bring industrial products within the reach of masses, realising their standard of living. He further expected that keeping in view the objectives of the VIIth Plan, employment will grow faster than the growth of labour force and for the first time in the history of planning, there will be no current backlog of unemployment while the earlier backlog will also be reduced".³

II

Debates on appropriate or alternative technology have resulted in a growing awareness of the marginalisation of large groups of people in rural and urban sectors. The problems faced by women workers are closely linked with the problems of over all development strategies in the country. The global economic crisis, mounting debt burdens and trade deficits and cut back in

³ The Times of India - 9th November 1985 "Prime Minister's call to adopt new technology".

development aid, has forced many developing countries to rely on export-oriented growth strategy. An even more important issue is that the existing inequalities in international economic and political relations have resulted in advanced industrialized countries transferring the technologies to developing countries to solve some of their own crises by relocating certain industries in the developing countries. Developing countries often find it difficult to control the structural change in their industries and exploitation of the work force. Existing structural models in the industries are not conducive to the integration of women in the process of development... Women are usually engaged in labour intensive industries with low productivity e.g. processing industries like textiles, food, leather etc. Their wages are influenced by their poor bargaining position and they have no influence at all on working conditions. The treatment of the female labour force to a large extent is a reflection of their low status on the labour market, lack of training and proper education, low or non-implementation of protective legislation particularly in export-oriented industries and their generally unfavourable position.⁴

Women's participation in the labour market is characterized by several interrelated factors:

- i) Sectoral distribution of women workers and the sexual dualism in the labour market: Not only that women's employment continues to be concentrated in primary sector but bulk of it is in the informal sector. The primary sector (agriculture, livestock, forestry, fisheries plantations and orchards) provides work to approximately 83 per cent women workers. Handlooms, handicrafts and rural industries because of their labour interwine character provide work opportunities to women workers. In Khadi and village industries, 45 per cent of its workers were women (1983-84). They are mainly employed in spinning (cotton, wool and silk) fibre industry, cottage, match factory, and processing of cereals. Studies show that women are increasingly confined to home-based production in textile, tobacco and clothing industries.
- ii. Sexual division of labour and occupational segregation of women has become an important instrument of discriminatory practices against women. Within each sector there is occupational segregation as women are engaged usually in labour intensive industries with low productivity and in low skilled and low paid jobs.

⁴ New Delhi Document on Women and Development - Conference of non-aligned and other Developing Countries on the role of women in development, Delhi, April 1985.

- iii) The concentration in certain jobs leads to income differentials between women and men and displacement at time or capital-intensive and labour-saving technology and over supply of labour with a preferred demand for male labour. It is well known that in female intensive industries wages are lower than in other industries.
- iv) The duality of the educational system not only in terms of classes but also gender, has meant that the literacy and training gap between women and men has remained wide. The number of illiterate men in absolute number has gone up from 148 million in 1961 to 172 million in 1971 and 182 million in 1981. While in the case of women the figures are 185, 214 and 241 respectively for the corresponding years.

The sex ratio of illiterates (illiterate women per thousand men) has gone up from 1250 in 1961 to 1243 in 1971 and 1322 in 1981. A cross country data on education, skill development and training and women's access to productive assets and resources, supports the observation that through an informal process of socialization and mechanisms of division of labour and selection, the society channels women in what is considered suitable for them. The treatment of female labour force is to a large extent a reflection of their low status in the labour market, lack of proper education and training. The Planning Commission set up a Working Group to review Vocational Training of Women (1984) and suggest restructuring of existing schemes, identification of new occupations, evolve broad perspective of training requirements. The report indicates that majority of women in ITI's have been undergoing training in cutting and tailoring, embroidery and needlecraft. The position is similar in respect of non-formal training programs. It points out the need to diversify training programme in new and emerging areas like computer sciences, entertainment electronics, medical electronics, hotel and catering tourism, para medical services etc.

- v) The growth of market technology has adversely affected women, however, on the other hand it has not made any significant dent in reducing the drudgery of rural women. In 1981 it was estimated that there were about 231,000 problem villages in the country without safe source of water supply. The problem is further aggravated by the fact that women spend a disproportionately large time in collecting fuel, fodder and water in the villages. It is against this background that the impact of technology on women, needs to be understood.

The Displacement Argument vs. Efficiency and Productivity Argument - Few Illustrations

The 'Women and Development' debate in the last decade has increasingly focused on women's work particularly from the perspective of poor women. Studies have accumulated evidence that the relationship between technology and socio-economic system is a complex one. However, new technologies have often displaced women from their traditional avenues of employment and even where they have increased employment opportunities (electronics, export-oriented industries like garment, food processing textiles etc.) Women are confined to limited range of occupations/ skills.

A workshop on "Women, Technology and forms of Productions" raised several issues such as⁵:

- Are all technological changes necessary?
- Who takes decisions on introduction of new techniques and who benefits?

- What are the implications of introducing technological changes in different spheres of productive activity without any changes in the ownership patterns, division of labour, generation of surplus and its accumulation?

- What are the implications of women's employment in the home-based production, putting out system in the informal sector and factory production?

- What is and what ought to be the role of State in protecting workers interests and regulating choice and transfer of technology?

- What has been the role of trade unions in addressing their issues?

There are all interlocking issues for which there are not perspective answers. The following section is intended to draw attention to some of these issues and to the process of displacement due to thoughtness mechanization throwing lakhs of women and men workers from the poorer households out of employment.

(a) Agriculture Modernization Technology Transfer and Women's Work

A considerable body of literature has grown ground this issue. Research during the last decade has shown that despite predominantly male farming systems in Asia, women's roles very with

⁵ Women, technology and forms of production, Madras Institute of Development Studies, October 1984.

respect to regions, cropping patterns, local traditions and changes in labour market demands, however, there is invariably an inter linkage between class and gender vis-à-vis agricultural work. Studies have shown that the impact of technological changes on women's work roles needs to be understood in the context of agrarian social structure and concomitant division of labour.

In India 60's saw agriculture modernization and technology transfer as a major thrust to attain self-sufficiency in food grains without changing the rural agrarian structure. It is already recognized that changes in agriculture during the last few decades have taken the form of class and gender differentiation where men predominate in the management of cash crops or large scale agriculture and women continue to work in the subsistence sector. The process of agricultural growth has led to increasing landlessness and pauperization of marginal farmers and agricultural labourers and out-migration. Despite women's crucial role in food production and processing, under-enumeration and under-valuation of their work due to its invisibility in the subsistence production and on family farms and unequal access to assets, skills and resources, have already worsened their position. Technological changes have not only displaced a large number of women or reduced their employment in pre and post harvest operations (use of chemical herbicides, advent of harvestors, threshers and rice mills, maize shellers etc.). Case studies clearly indicate that post harvest operations by grain processing mills have displaced women from poorer households, but programmes of land reforms, technology transfer, credit and extension services have shown class and male bias, thus increasing class and gender polarization. (Acharya 1984, Agarwal, 1981, 1984, Sen 1983).⁶ It is equally a fact that alternative opportunities for wage and self-employment to meet the demand could not be created. Moreover technological support to reduce women's daily drudgery involved in fetching drinking water, fuel and fodder, has yet to make any major dent in the problem. Thousands of villages are still without any safe drinking water. Rural women burdened with time-consuming tasks have very little time for investment in self-development.

It has been argued that besides class differentiation there also gender differentiation in terms of technological changes on absolute and relative work load, access to and control over cash income and access to relative consumption (Agarwal, 1984). Data from the two Rural Labour Enquiries 1964-65 and 1974-75, shows that following the green revolution and introduction of HYV package the number of agricultural labour households have gone up from 15.3 m. to 20.7 m. and the - number of agricultural labourers went up from 30.8 to 46.4 million it is not argued here that the problem is with technology per se but the context within which it is introduced gives it a specific character as pre-existing class and gender biases are reinforced.

⁶ Acharya, Sarthi - Women and rural development in the third world- (Mimeo) TISS 1984.

Agarwal, Bina - "Agricultural modernization and third world women: some pointers from literature and empirical analysis. WEP 10/WP/21 ILO, Geneva.

A country report on 'Women in Rice Panning Systems in India' indicates that female work force participation rate declined during the period 1961-81 (Acharya and Patkar 1983, Ghose and Mukhopadhyay 1984) and a major factor was displacement of women workers by the male workers⁷ in the total work force, and inadequate employment opportunities for women.

It has also been noted that even when the overall demand for labour has increased 'the women prone' jobs are often the ones which require less skills in the hierarchy of jobs and if a particular occupation earlier occupied by women is upgraded by some available technology it is immediately converted into a male job and consequently the gender gap in wages is persistent. It has been estimated that the number of rice mills is above 100,000 and a micro study in Maharashtra shows that a typical rice mill displaces about 1500 women's jobs and creates about 45 jobs for men (Acharya and Patkar 1983).

(b) Fishing Industry

The mechanisation of fishing industry since 50's has in the last few years led to many violent struggles in Kerala, Tamil Nadu and Goa. Prompted by the demand of a global market for prawns, shrimps and lobsters the government encouraged the international development agencies for mechanisation of fishing crafts and advanced loans to big industry concerns to invest in various export fishing. The super imposition of modernisation on a traditional industry has created a crisis for those who subsisted as their daily income due to a steady decline in marine fishing. The issues raised by the fisher folk were:

- Noise of the trawlers drives away the fish;
- propellers of new boats tear the nets of artisans/fisherman;
- bottom trawling operations by large fleet mechanised trawlers have resulted in drastic fall in fish catches per fisherman.

It is estimated that there are about 6.5 million people engaged in fishing and allied activities. In the coastal regions more than 80 per cent are in the small scale traditional sector. In the coastal areas profit orientation and proliferation of trawlers with purseine-nets that damage the sea bed even in the spawning season affecting the fish eggs and larvae, have adversely affected the traditional fishing industry.

According to available statistics from CMFRI the average annual marine fish landings has declined from 4 lakh tonnes in 1970-74 to 3.6 lakh tonnos in 1975-79 and to further 2.93 lakh

⁷ Acharya, S. and Patkar, Pravin - Technological infusion and employment condition of women in rice cultivation areas, TISS, 1983

Ghosh, B and Mukhopadhyay, S.K. - Women, income and women: a macro-micro exercise in India," University of Kalyani, West Bengal, 1984.

tonnes during 1980-82 period. Thus the expectations that mechanised boat will exploit resources more extensively and intensively than the country crafts, did not materialise as over fishing in inland water led to a decline in fish catches.

The planned development of fishery industry also shows a bias against small scale fisheries. Between the years 1951-52 and 1982-83 an amount of Rs. 12.01 crores was spent on the development of mechanized fishing while only 56 lakhs was spent on the development of small scale fisheries (1.8 per cent of the total expenditure). Transfer of western technology without much concern for small scale units and subsistence fisher folks and entry of non-fishermen in this field shows that the only motive was quick profit.⁸

After the 1981 agitation in Kerala for banning trawler fishing, the government set up a commission which submitted its report in 1982 recommending appropriate measures for conservation of fish resources. They could not reach a consensus on the issue of banning trawlers during monsoon period.

The Indo-Norwegian Project the first development project to transfer resources and knowledge and aiming to raise the productivity of fishermen, gave a great spurt to the growth of mechanized fishing along with other infrastructural facilities like Ice plants, freezing and processing technology. Production of prawns rose considerably and foreign exchange earnings went up. People who benefited were boat owners, capitalists and exporters.

The emphasis on growth rather than distribution, import of big trawlers for deep sea fishing has worsened the situation of fishermen. By 1983 at least 3 states have enacted Marine Fishing Regulation Act which prohibits purse seiners and other large vessels to operate in coastal waters up to 22 kms from the shore. The law has not been effectively implemented.

A study of the, coastal fisher women of Kanyakumari reports, that in 1978 when fish-net making machines were brought by a private trader, it cut into the meager income of women weaving fishnets at home. The Tamil Nadu fisher folk protested against the granting of license to import automatic net making machines as 300000 women engaged in making nets manually at their homes, would have lost their jobs. The study found that increasing urbanisation and the growth of markets has also affected women negatively on two counts: the introduction of nylon nets fabricated by machines have deprived them of income and introduction of auction system has forced women to compete with large traders causing them loss as marketing was their traditional activity. ⁹

The ISST study indicates that a large number of women in Kerala fishing industries have lost their jobs and as a result are forced to migrate to West Bengal, Maharashtra, Orissa, Tamil Nadu and Gujarat and work in fish processing plants as peelers, graders and packers. In Gujarat, Veraval and Bulsar have the highest concentration of fishing households, 90 per cent of

⁸ A note circulated on the fishermen agitation in Kerala - by Kerala Independent Fisherman's Federation.

⁹ Ambarasan, Karuna; Case studies of three fishing villages in the Chingleput district of Tamil Nadu.

prawns processed are supplied to Japan while processed fish goes to middle-east countries. The peak season for fishing is from August to May, the Kerala women are employed for 9 months in a year and payment of wages is done by the contractors who are paid by the management. Deduction in wages, incidence of non-payment, violation of Minimum Wages Act and Inter-State Migrant Workers Act, were also noted by the study. They are also not allowed to unionise.¹⁰

(c) Tobacco Processing Industry

A highly labour intensive industry, it employs a large number of women having traditional skills of processing of tobacco by hands. It is estimated that about 30,000 women are employed in the industry, of which 20,000 women are employed in Kaira in Gujarat alone and 5,000 in Nipani in Karnataka. Gujarat (80% of beedi tobacco) and Karnataka (18%) are the major producers of beedi tobacco. A large proportion of these workers are from scheduled castes and many of them are sole supporters of the family. The processing of tobacco is done by women which consists of breaking raw tobacco leaves into small flakes, sieving and grading the flakes, pounding the stalks into powder and blending flakes and powder with water. Several studies have noted the reduction in person-days if this process is semi-mechanised or mechanised. (Dhruv Mankad, Chaya Datar).¹¹ 1976 was the turning point in the history of Tobacco processing industry. Many factories have already switched over from manual to semi-mechanised process. There is now a trend towards full mechanisation. In Kaira and Nipani two processing units have already introduced a fully mechanised unit supported by the state government and financial institutions. It is estimated that in the last four years there, has been 35% reduction in person-days employment. According to one estimate the number of workers comes to 4,983 by hand process, 1,496 by semi-mechanised process and 233 women only by mechanised process for processing 2,24,492.00 kgs tobacco.

Since 1980 unionisation among women workers against this easing out of women, resulted in tobacco traders' counter offensive in terms of full mechanisation, With the mechanisations the factory is running in three shifts and women are excluded from the 2nd and 3rd shifts. Men workers are for the first time indicted in processing. Disputes relating to compensation to workers who are laid off and the nature of industry whether it is seasonal and intermittent is pending before the courts. This mechanised unit has also started processing tobacco of other merchants and state cooperative on job work basis.

¹⁰ Institute of Social Studies Trust - Kerala women in the Fish Processing Unit of Gujarat

¹¹ Datar, Chaya; Perils of mechanization: development of displacement

Mankad, Dhruva; Notes on Bidi Workers of Nipani. Both these notes were circulated in the meeting held on 29th July 1985 at the Ministry of Labour to discuss employment of women in Tobacco Industry.

In Andhra, leaf Tobacco Industry had 1,25,000 workers of which 90% women. There were 400 small companies but dominated by four major companies - ITC (multinational), Golden Tobacco Company, National Tobacco Company and Navbharat Enterprises Ltd. The ITC employing 20,000 in its leaf division introduced a threshing plant displacing about 6,000 workers. One lakh women are threatened to be affected by the granting of license of install an imported threshing plant. At Anaparthi, a 5 crore giant green leaf threshing plant will throw out women stemmers and women workers at Chirale factory in Rajamundhry, Guntoor, Panchoor, Ongola, Tangutur. 70% of these workers are Harijans and Girijans.¹²

Several workers have been demanding:

- a) A ban on importing of Tobacco processing machines and no new licenses to be issued for its installation unless alternative employment opportunities are generated for this most vulnerable section of workers;
- b) Labour Minister to urge the Ministry of Finance to take fiscal measures such as restrictive financial assistance and prohibitive excise on machine rolled bodies to protect the employment of 30,000 women tobacco processor as has been done in the case of cigarette industry. There is not excise on processed tobacco since 1979 while prohibitive excise on machine made bidies has prevented the process getting fully mechanized;

The process by hand needs only investment in the warehousing space while in the semi-mechanised process the machine costs Rs.40,000 and the fully mechanized category it costs Rs.40 lakhs. The Karnataka Government is giving 10% subsidy in addition to institutional finance. In a labour intensive sector, such heavy investment of capital and labour displacing technology, does not seem to have any justification.

(d) Women in Textile Industry

The Indian Textile Industry consists of Mill sector, handloom sector and the powerloom sector. Textile, one of the oldest industry, employed women in substantial numbers. Studies from Bombay, Calcutta, Ahmedabad and Kanpur have shown that in pre-independence days women constituted nearly 20 to 40 per cent of the work force and now the hardly constitute 5 per cent of the total work force in textile industry. In the 50 years of industrialisation between 1925-75 the three major industries cotton textile, jute textiles and coal mines employed 20, 15 and 38 per cent of women workers respectively in the total work force. Their number was reduced to 2.5,

¹² The voice of working women. Vol.1, No.1, January 1981 and Vol.II, No.2, March/ April 1982.

2.0 and 5.0 respectively in 1975. In the cotton textile the process was continuous but gradual. In the Jute industry there was a sudden decrease in the number of women workers during 50s. Usually protective legislation and mechanisation is offer as the reasons for decline in women's work. The report of the CSWI cited technological changes as the single most important factor for the decline in women's work employment. A study on textile industry in Ahmedabad commenting on the mechanisation argument says "Technology is made 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 rationalizations. Our Unions and progressive force unable to fight the growing monster of unemployment, save their own skins by throwing out the women workers as its first victims.¹³

A Labour Bureau Survey in 1977 of 30 units of cotton, jute and silk, textiles, mica and food processing, indicated that in textile units during 1971-76 there was a continuous decline in the overall proportionate employment of women from 4.68% to 8.87%. They were employed in the production process in 3 occupations - as reelers, winders (ordinary) and high speed winders. The study clearly concludes that expenditure imposed by legislation was not the cause for retrenchment but was largely due to rationalization, automation, improved technology and restrictions on employment of women during night shifts.¹⁴

The Handloom Sector - The handloom sector which employs millions of artisans all over rural India was given protection against the unequal competition from mills and powerloom sector and ceiling was put on the output of cloth by mills to protect the employment of handloom weavers. The protectionist measures also included obtaining a license for powerlooms and reservation of certain varieties of cloth for production by the handloom sector. The new textile Policy of 1985 has thrown the caution to the wind. Commencing on the anti-employment stance of the new Textile Policy, Jain says, "The most significant departure the new textile-policy has made from the past, is in its resolve to liberate the making of cloth from the burden of employment. This formulation destroys the very rationale for support to handloom and khadi. Not only all capacity restrictions have been withdrawn on mills and powerlooms but all conceivable financial, fiscal and other assistance has been offered to enable them to occupy market rapidly..... The product reservation and the so called, package of development assistance offered to handlooms are hollow and a mere smokescreen for a basic anti-employment, anti-handloom and anti-khadi shift in policy".¹⁵ The Sivaraman Committee for the Handloom Industry appointed in 1973 had found extensive displacement of handloom weavers

¹³ Rehana Jhabvala; Closing doors: a study on the decline in women workers in the textile mills of Ahmedabad, Setu, 1985.

¹⁴ "Study of the employment of women in selected industries"; Labour Bureau, Ministry of Labour, Government of India, Chandigarh, 1977.

¹⁵ Jain, L.C.; 1985 Textile policy: end of handloom industry - Economic and Political Weekly, July 6, 1985.

by the growth of authorised and unauthorised powerlooms. Subsequently the 1981 Textile Policy statement stressed the need to "Provide adequate protection to the handloom sector and regulate and monitor the growth of powerloom sector."

To evade the output restrictions the mill started setting up benami powerlooms, supplying them sized beams and taking over the finished cloth through their agents. Mills gave preference to powerlooms in the supply of yarn, the handlooms receiving only the residual yarn of indifferent quality. The attention drawn to this phenomenon by various study teams and parliamentary Committee resulted in clubbing powerlooms with the decentralised handloom and khadi sector of the textile industry. The number of cotton powerlooms expanded from 80,000 to 4.24 lakhs between 1963-83 and many unauthorised powerloom were regularised (by October 1983 about 2.62 lakh powerlooms were regularised according to the Commerce Ministry).¹⁶ A major concentration of powerlooms is in Maharashtra, Tamil Nadu and Gujarat. Subsequently the government also initiated a move to upgrade the equipment of traditional handloom weavers and convert them into powerlooms. Sometimes to disastrous results.

The ISST study on the modernization of the traditional handloom weaving industry in Kashmir, found a sharp reduction of 40-80% in the employment of allied workers mainly women from the weavers households. The project was sponsored by Government of India with the assistance of UNDP. About 16,000 women were employed as hand spinners. Another 10,955 persons were engaged in pre-weaving and weaving operations. The modernisation included the replacement of handspun loom and manual preparation of warp and waft by a centralised mechanised unit and installation of a modern plant for pre-loom and post-loom processing (scouring, dyeing and finishing). About 2000- 3000 women involved in preparation of warps and waft were likely to be affected. The traditional marketing channels have also been disrupted as weavers are not allowed to produce for anyone except for the project.¹⁷

Another study undertaken by the IIM, Ahmedabad of 5,000 weavers at Puraini (near Bangalore), has come to the conclusion that research and development efforts in Indian Tasar industry in mid sixties to enhanced raw material utilisation efficiency, product quality and export, have seriously undermined the self-employment basis of this traditional cottage industry and reduced them to the status of casual labour, dependent on a few entrepreneurs who have proprietary access to it. The Tasar Silk Tract spread in the forests of Bengal, Bihar, Orissa and Madhya Pradesh has weaving centres at Tantipara, Roryadha, Dench (West Bengal), Bhagalpur and Sultanganj (Bihar), Bisoi, Chandua and Bhusini (Orissa) and Campa (Madhya Pradesh). Most of the weavers are either Muslims or from scheduled caste/ scheduled tribes

¹⁶ Jain, L.C. "The phenomenon, scale and process of displacement of women in traditional industries: some instances and issues".

¹⁷

and mainly women, The output is marketed through 20 traders who concern 70% of the market share.¹⁸

Similarly the growth of mechanised printing of cloth with substantial investment in the interest of 'experts' has edged out the hand printers although 94% of the mill printed textiles are unleaded in the domestic market. It is estimated that a quarter of million job opportunities have already been lost in the hand block printers (proportion of women is between 25-30 per cent).¹⁹

The newly reconstituted Khadi and Village Industries Board reviewing the problems of khadi in the overall context of Textile policy of GOI, suggested steps to enable it to play its role by -

- (a) reserving the production of coarse yarn in the range of 6 to 15 (metric);
- (b) reserving the production of yarns above 15 counts (metric) for khadi sector at adequate wages;
- (c) all khadi and polyvastra to enjoy all those benefits as the handloom sector;
- (d) purchase and price preference to cotton, khadi, woollen khadi and polyvastra;
- (e) banning import of rags or suitable restrictions imposed on shoddy industry in the interest of Indian economy;
- (f) future expansion of spinning capacity of woollen mills to avoid unemployment of spinners in hills and border areas;
- (g) subsidizing the sale of handspun yarn of handloom sector to neutralise, the price difference between handspun and mill yarn.

The production of Khadi registered a marginal decrease by 5 per cent to 102.75 million sq. metres from 107.91 million sq. metres in 1982-83, although in terms of value it rose from 143.40 crores to Rs.153.48 crores. During the sixth Plan period KVIC was expected to create job opportunities for 1.3 million while, it created opportunities for 0.8 million persons during the first four years. The net grant was percentage of production and sales also declined from 2.09 in 1982-83 to 1.9 in 1983-84. Production of cotton khadi which employed 3.60 lakhs full time and 6.98 part-time persons declined from 91.72 in 1982-83 to 86.17 in 1983-84.²⁰

New Industries and Health Hazards for Women Workers

Some of the newer industries like garments, electronic and units in the Free Trade Zones or Export Processing Zone have found newer ways of exploiting women. Subramnayan reports that in FTZ "stress linked illness" has emerged as a major hazard for assembly line workers as the work is repetitive tedious and high production quotes are imposed. Forced

¹⁸ T.K. Moulik and P. Purushotharam - the Indian Tasar Silk Industry and the new technology: a case study of modernization of conventional technology and its field suitability, IIM Ahmedabad, 1984.

¹⁹ Jain, L.C.; op. cit.

²⁰ Annual Report of Khadi and Village Industry Commission, 1983-84.

overtime and night work for meeting production quotas create me: and physical stress.²¹ All the ingredients of oppressive international recipe are contained within the garment industry the exploitative division of labour re-location of units, production quotas and deskilling function, anti-labour conditions health hazards and sexual harassment.

In the electronic industry women are expected to soak between 12,000 to 22,000 integrated circuits into chemical solution everyday to rustproof and strengthen them, dip and silicon chips into toxic acids and continuously peer through microscope. Ill ventilated electronic industries create the problems like respiratory diseases, dizziness, headache, fatigue, nausea, burns, ulcers and deterioration of eyesight. Employers neglect safety precautions. There are practically no labour laws operative to protect the interest of the women workers laws. The employers are protected by anti-strike laws.²²

In the factory sector as a whole women's share has been continuously declining (17.0 per cent to 10.6 per cent) particularly in food, tobacco, textiles, chemicals, mineral and electrical goods. In an analysis of occupational shifts in the employment of women in the household and non-household sector, Mitra clearly attributes the decline of women in non-agricultural sector to obsolescence of occupations which were female labour intensive and technology which transferred women's job to factories and men and growth of newer industries which did not absorb women.

Modernisation is taking away traditional occupations from women's hands and making more and more women unemployed in non-agricultural traditional occupations. 3.3 million women lost their jobs between 1960-81 and those not thrown out are displaced in low skill, low productivity and low wage manual jobs.²³

Examples multiply from other sectors on the impact of automation of women's employment and working conditions.

Krishnaraj posing women's dilemma of industrializing India says that the question, when and why women are preferred in certain industries is as important as the question when and why they are discouraged. The ready made garments industry seem to favour the employment of women. It is because it is decentralized or is it because it is labour intensive? The process of segmentation of labour is a complex one wherein economic processes intertwine with existing social prejudices in ways that increase gender inequality. A further ramification to the problem of segmentation is the suspicion that in addition to pre-entry discrimination there is also post-

²¹ Balasubramanyam, Vimal: "A global assembly line", EPW, Bombay, Vol.1XIX, No.30, July 1984.

²² Patel, Vibhuti; "Impact of modern technology on the employment and the condition of work in India, Bombay University, 1984.

²³ Patel, Vibhuti; Impact of modern technology on the employment and the condition of work of women in India. Paper presented in a workshop on "Women, Technology and Forms of Production"; October, 1984.

entry segmentation based on a belief what is suitable for women or for jobs they possess special skills.²⁴

Ghosh in his study of women labourers in coal mines of Eastern India, says that the technological developments in the coal industry had cast the die of redundancy of women and the trend has continued even after nationalisation of mines. Women are assigned only particular kinds of jobs mostly unskilled and vulnerable to mechanical appropriation. The stereotyping of women's functions in the coal industry is conveyed by the remarks made by a Senior Personnel Officer of the India Mining Association that women are more suitable for certain jobs like sand loading and wagon loading. These jobs are now taken over by machines. According to him the logic of capitalisation has even received a fillip and labour saving devices have been imported at an accelerated pace after nationalisation in 1973.²⁵

The history of trade union movement shows that in the majority they failed to take up these issues. On the contrary there are instances. Where they co-operated with the management in following a policy of retrenchment of women. The case of coal industry is an example where unions have made agreement with the management and all tasks of loading and unloading operations are being mechanised. The nationalised coal industry has in fact introduced an incentive scheme called "voluntary retirement scheme" where a woman worker voluntarily retires in favour of a male relative from the family. It is estimated that between 1979-1981 over 5,000 women have lost their jobs either through Voluntary Retirement Scheme or had been retrenched (Ghosh, 1981). The prevailing family ideology which sees man 'as the bread winner' and women in her glorified role as mother, needs to be challenged. Women will have to fight unitedly for the recognition as workers and that the care of children is not their sole responsibility. The state will have to ensure child care facilities.

The question is why employers, trade unions and men workers have used gender for discrimination against equal opportunity for women's wage employment. It is a fact that until the Sixth Five Year Plan, the Government of India did not explicitly mention women's employment as an important goal of national development planning. This 'invisibility' of women is a painful phenomenon and combined with the psychology of employers to use women as cheap source of labour and dominant ideology of viewing women as supplementary earner/ marginal women afflicts women's options and opportunities.

Banerjee argues that women are usually hit harder by technological development for several reasons. In general, in most economies they are more heavily represented in the subsistence crafts which are often an extension of household activities i.e. food processing, dairy products, fish drying etc. For other products like textiles, cane, bamboo and wood products, women are, if

²⁴ Krishnaraj, Maithreyi - New opportunities on old terms: the case of garment industry in India, SNDT Women's University, Bombay, 1985.

²⁵ Ghosh, Anjan, "Escalating redundancy: dispensability of women labour in coal mines of Eastern India". Paper presented in the workshop on "Women, technology and forms of production", 1984.

not sole, the more important section of the work force. However, in case of each of these crafts or operations, women used the curdest tools and techniques with least investment per unit of labour.²⁶ The same patterns is found in large scale industries as the investment of capital per worker is significant low in all industries where women are found in significant proportion. Lack of proper tools for women's occupations go hand in hand with lack of access for women to technical training and knowledge of possibilities opened up by modern science and technology, so that they are vulnerable to the on slaught of technological obsolescence. In many instances when traditional women's crafts are being modernized to meet the demands of growing markets, the new skills and tool are being made available to men. In other cases a shift in demand in favour of their products usually goes hand in hand with a change in marketing organization and elaborate net work of intermediaries. For example, greater demand for Bengal's rough silk material woven from hand spun yarn from damaged cocoons, has given a fillip to the industry, but women are unaware of the changed situation and earn less than 2 per cent of the price of the final product. Women remain the most vulnerable and less organized group of workers without equal access to means of production.

IV

Making Technology Systems Responsive to Women Needs: Some Suggestions

The Technology-Policy statement in its preamble clearly states that the use and development of technology must be related to the people's aspiration. While aiming at the attainment of technological self-reliance and efficient absorption and adaptation of imported, technologies appropriate to national priorities and resources, it emphasises that our immediate need is a swift and tangible improvement in the conditions of the weakest sections of the population and the speedy development of the backward regions. The future depends on our ability to resist the imposition of technology which is Obsolete and unrelated to our specific requirements and on our success in dealing with vested interests in our organization, governmental, economic, social and even intellectual. We seek technological advancement not for prestige or aggrandisement but to solve our multi farious problems Keeping in mind our capital scarce character, it should aim at ensuring that our available natural endowments, especially human resources are optimally utilised The objectives of Technology Policy include use of traditional skills and capabilities and making them commercially competitive, emphasis on employment of women and weaker sections of society; ensuring correct mix between mass production technologies and production by the masses and ensuring maximum development with minimum capital outlay.

²⁶ Banerjee, Nirmala; "Women and industrialization in Developing Countries" (Mimeo, 1984).

The VIIIth Five Year Plan lays special emphasis on food, work and productivity. This obviously means that technology choices should be linked to our plan objectives. Future strategy of technology, development planning and implementation should be able to expand options and job opportunities rather than narrow down the options of the poor and the most vulnerable sections of populations. In that case shouldn't we accept certain limits to our technological growth particularly in relation to these residual categories of workers? In such a case the proposition has to be politically and socially acceptable and should be reflected not only in our policy documents but also in technology transfer programmes.

The policies and programmes for reducing levels of poverty should pay adequate attention to the importance of stabilising the incomes of the poor and not displacing them.

A rigorous application of 'social impact analysis' to see that the utilisation of total resources is enhanced and not just the productivity of a particular enterprise. The general ethos of industrial system seems to be that the humanist issues are irreconcilable. For the state with its enlarged public responsibility, the challenge lies in integrating in a mutually supportive way. The problem lies at several levels -

- (i) weakness of decision-making systems and pressures from producers and entrepreneurs;
- (ii) weakness of regulatory and legislative system;
- (iii) weak linkages between technology developers, users and policy makers;
- (iv) lack of coordination between different departments ministries and institutions entrusted with the task of, research and development, manpower planning, industrial licensing, finance and technology evaluation. The Ministry of Industry issues licenses for importing technology while the employment is the concern of the Ministry of Labour.

Starting from the basic premise that technologies per se have no inherent gender bias -but the skewed distribution of assets, resources, and knowledge between classes and gender and the ideology of gender and market forces operate against women, the impact of new technologies need to be assessed in a total context instead of an activity by activity approach.

During the discussions held in the Ministry of Labour in March 1985, for the preparation of a National Programme for Women Workers, it was pointed out that the magnitude of the problem was so large that isolated activities would not be able to meet the requirements particularly of those women engaged in non-formal and unorganized sector. It is therefore imperative that a national perspective is formulated and programmes for women workers should be in conformity with the former. It was also emphasized that access to employment of women should be a concern of all Ministries/ Departments and organizations of Central and State Government.

Focussing on the question of technology and women's employment, the paper noted that the subject has several aspects. The dimensional angle which includes the question of numbers,

sectors participation rate etc. The second is the qualitative aspect which includes distribution between organized and unorganized sector, wages and productivity. The third question relates to skill formation and training, including basic issues of manpower, planning and development and lastly the institutional and organizational aspects including credit and marketing support. All these issues need to be tackled in a co-ordinated way as isolated attempts to deal with these problem will not be effective.²⁷

An effective strategy for dealing with the problems discussed earlier, will have to combine both short-term and long-term measures and will have to tackle both the public and private sector, the organized and the unorganized sector of the Indian economy. It is essential to realize that job destruction could cause much distress to families where the women's income is crucial to the welfare of entire family. Sensitisation to these issues, alone will not be adequate to generate necessary motivation unless it is supported by appropriate packages of policies, (including review of government loan price support and investment policies and their implications) and action.

Suggestions for immediate action

- (i) Issue a directive particularly to all public agencies to ensure that there will be no further reduction in the level of women's employment and suitable steps will be taken to retain and absorb them when technology is upgraded. The indirect methods of reducing women's employment such as Voluntary Retirement Scheme should be abolished.
- (ii) A small planning group should be constituted by the Technology Policy Cell the Cabinet Secretariat, to design a format listing out criteria for evaluation of all proposals of technology transfer and automation in industries
- (iii) Committees should be constituted at the Central and the State level to scrutinise all applications for loans and for imparting technologies which will displace women labour. Such Committees should have representatives of TPIC, Planning Commissions Project Appraisal Division, Ministry of Labour, Industry, Financial Institutions and Women NGO's at the Central and representatives of Ministry of Labour & Industry, Financial Institutions and women NGO's at the state level.

Technology plays a decisive role in nation's development however, the decisions on questions of development national technological capabilities often overlook human dimension. Besides short-term malady-remedy analysis, a long-term perspective is required for much needed ideological change.

²⁷

- (i) The Ministry of Labour should prepare a list of sectors/ industries which are labour-intensive and provide employment to sizeable number of women and where technology transfer may jeopardize their employment. In such cases the pace and degree of mechanization should be so regulated and phased out that women are trained on the job. In some of these areas, capital - intensive technology should not be permitted. The Planning Commission's Working Group on Employment of Women, had earlier prepared a list of female-labour intensive industries. This can be reviewed, however, it should not mean that women should not be trained for new and expanding opportunities.

Experience has shown that retraining of displaced women labour for alternative employment opportunities for self-employment has not been effective particularly for poor women where redundancy of their traditional skills further pushes down their economic position.

A comprehensive effort should be mounted and supported by fiscal, technological and administrative policies to make capital more costlier for such industries which employ the weaker sections of society, keeping in view the long-term national objectives.

- (ii) The Project Appraisal Division of Planning Commission in collaboration with the Technology Policy Implementation Committee should formulate clear guidelines for the approval of import of technology or automation in any given industry by listing out issues critical to be considered in technology assessment and valuation, giving weightage not only to reduction Substitution of in foreign exchange payment export promotion, substitution of imports and use of domestic raw material but also its impact on employment by sex. These criteria should be evolved in the light of many studies which have been done.

The Inter-Departmental Working Group set up by the Technology Policy Implementation Committee, to draw up guidelines for technology assessment and evaluation, unpackaging of technology and absorption of imported technology, has made a large number of recommendations (1985). Its main concern was to review the existing technology assessment systems in the country and make suggestions for their improvement. One of its objective was to suggest criteria to assess the existing and newly emerging technologies in relation to their impact on employment, energy consumption and environment.

While the need for the future to guard against obsolescence in the choice of technology has to be kept in mind, however, this should not be done at considerable human cost.

- (iii) It should be incumbent on the employers to prepare a good feasibility report before submitting their proposal for loan for technology transfer to the government, indicating existing capital-labour ratio and changes expected after introduction of technology, present pattern of employment sex wise within the industry at skilled, semi-skilled and unskilled levels and the demand for different categories of labour after technology transfer. They should also submit plans how they are proposing to train workers for absorption. Such proposals should also indicate training needs linked to future developments in the industry.

It has to be kept in mind that mass production of goods and services without ensuring purchasing capacity of the poor will net increase the demand of such products by the people.

- (iv) The government agencies processing such proposals usually do not have adequate data on non-technical issues to give adequate weightage to them. Instead of doing a post mortem analysis of the impact of production technologies on employment of women, there should be an inbuilt system of such evaluation. A multidisciplinary group for technology evaluation may be set up under the aegis of Ministry of Labour drawing expertise of several Organisations within the government (including Planning Commission, economic Ministries, financial institutions entrusted with the responsibility for analysing technology choices. Department of Science and Technology's Cell of Women, representative of TPIC, training institutions and Research and Development systems) and from non-governmental organisations - pooling together data and information. The report prepared by the Group should be given due weightage while considering proposals of technology transfer and should be disseminated widely particularly among development council and institutions concerned with this area. The concern with employment issues should not be the responsibility of a particular Ministry but there should be close functional linkages between the relevant ministries and departments.
- (v) Training System Review of current training programmer both formal and informal, indicate that courses and training techniques have not responded to the changing needs of the economy. Currently formal training programmes are conducted by the National and Regional Vocational Training Institute, ITI's,

Polytechnics etc. and the non-formal training programmes are conducted by agencies like KVIC, Ministry of Rural Development (TRYSEM), Ministry of Industry, Health, Family Welfare, Social Welfare Board, 10+2 Vocational stream of Higher Secondary Board and Voluntary Agencies.

There should be an in-built system of evaluation in all such training programmes to measure utilisation or wastage of training. Information about the demands of public enterprises/ industries so that a perspective plan for training could be prepared.

- (vi) Regular social audit and a far more efficient systems of determining occupational safety and health of worker needs to be established in order to minimise health hazards for women workers particularly in those industries which have already been identified under the scheme Science and Technology for women in the DST. The status report on "Occupational and Environmental Health Problems of Indian Women" prepared jointly by Industrial Toxicology Research Centre, Lucknow and National Institute of Occupational Health, Ahmedabad, has identified the R & D and intervention programmes which need to be taken up to minimise occupational problems faced by women.

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