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**WOMEN AND NEW
TECHNOLOGIES**

**SOCIAL DEVELOPMENT DIVISION
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ECONOMIC COMMISSION FOR LATIN AMERICA AND THE CARIBBEAN

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INTRODUCTION

The experience of these last 10 years, a lost decade as far as development is concerned, has shown us the urgency of designing new paradigms, benefitting from the analyses and diagnoses of the 1980s and taking into account the role that women actually do or potentially could perform. The subject of new technologies has aroused great interest, and much importance is being given to it as the key to a new development paradigm. Despite this, few studies relating the situation of women to new technologies have been done in the region. There is no question that in order to give more substance to proposals in this area, the perspective of women needs to be given greater attention, in as much as a seeming gender neutrality produces a distorted analysis. An approach that incorporates the dimension of gender would ensure that policy-makers give explicit consideration to the reproduction and maintenance of human resources. This means that the development paradigm must be analysed from two angles: first, it must be determined how the gender dimension can be incorporated into the proposal in question and, secondly, it must be specified what women do or can bring to the policies formulated.

Bearing these two questions in mind, this study is essentially a preliminary exploration of the impact of the introduction of new technologies on the productive and reproductive life of women. Basically, it is a matter of raising certain questions that for the moment are unanswered, since more research needs to be done in the region in order to arrive at an understanding of this largely neglected subject. Accordingly, in the final section of this study an outline is given of some methodological lines of research which are suggested by the problems discussed here. The underlying idea is that the introduction of new technologies sets in motion sweeping economic and social changes and that the manner in which such changes are manifested in the situation of women therefore needs to be examined. From the viewpoint of production, then, the object is to analyse the ways in which technological change can modify the traditional division of labour by gender and to determine if female workers offer "comparative advantages" for work involving the new technologies. From the standpoint of reproduction, the aim is to describe the impact of new technologies in that area, in which women perform a basic social function. These technology-inspired changes can be discerned in the separation of sexuality from reproduction through birth control and birth-spacing and in the solution of problems in many areas of women's lives.

I. WHAT IS TECHNOLOGY?

The nature and social content of technology can be understood more clearly if we accept that technology presupposes not only the use of techniques, equipment and skills that facilitate human activity but also a social organization that allows productive processes to take place (Sen, 1985). In a general sense the term "technology" means any practical application of knowledge to productive activities.

In the research on technological change, the term "technology" is applied in its restricted meaning to the instruments used in production technology or process technology, that is, the kind of machinery used to process raw materials into finished products. Because of the close relation between the equipment and the manner of execution, the use of the term has been extended to include a third dimension: the organization of work. Technology therefore covers the methods of conceiving and designing products, the labour process as such, and the ways of managing production (Montero, 1989). Thus, technological change means any modification of the technology for a given product, of the processes used by a plant or enterprise, or of the ways of organizing the work.

Special attention must be given to some dimensions of technological change that are an outgrowth of the introduction of new technologies. These include: i) microelectronics and its dual dimension, robotics and informatics, along with the latter's cultural and socializing impact on the population; ii) biotechnology and its impact on genetic engineering, which has strong repercussions on the technologies of reproduction and also on the new methods of food production which may actually make it possible for food to be produced independently of cultivation of the land. At issue in both cases are technologies that have modified the terms of reference of production and reproduction.

In short, by considering the ways in which work can be organized, a more comprehensive view is gained of the activities that should be performed inside and outside the home, which, taken together, constitute the production process.

II. THE PROCESS OF ADOPTING TECHNOLOGIES

The ECLAC proposal for changing production patterns with social equity puts forward a set of policies intended to promote, from a systemic standpoint, the access of countries to international markets. Among them, the development of a technology and manpower-training policy is given great importance. From this point of view, the proposal states that "... the solidity of a country's position in the international market is generally determined by the skill level of its population and by its capacity to participate in the ongoing process of technological innovation. More specifically, the soundness of its position will depend on the existence and progress of national firms capable of competing —either on their own or with the aid of inputs of foreign capital— against the firms supplying the international market" (ECLAC, 1990, p. 75). Because manpower skills are so crucial for technological development, it is necessary to study how women contribute to skills development in their dual socializing role as mothers and teachers. To date, progress has been made in studying the heterogeneity of human resources as regards the relation between the formal and the informal sectors, but the existing gender differences and ways of overcoming them have yet to be analysed.

Given the extent to which the countries of the region and, in general, the whole of the third world have lagged behind in this respect, some points regarding the adoption of technologies as part of a technological policy will be discussed in connection with the subject of technological production.

In order for technological changes to be introduced and maintained, society as a whole must adopt them; in other words, the development of any technology requires the enhancement of society's capacity to absorb that technology. Yet it is here that the basic contradiction between technological progress and social progress usually arises, in that technological advances take place in response to factors having to do with competition among countries, while a society's potential for absorbing technologies is determined by structural imbalances with historical and cultural roots. All this means that if a country wants to enter the field of new technologies, it cannot do so merely by investing in technology; it must also make radical cultural changes that the very technological advance helps to produce, albeit with a certain time lag. From this point of view, the development of human resources is essential for the assimilation of new techniques (Escario and Alberdi, 1986). C. Pérez puts it well: the world of the technically possible is much broader than that of the

economically profitable, and larger than that of the socially acceptable (1986, p. 43). We are thus faced with a major contradiction between the proposal to change production patterns, which places great emphasis on increasing productivity and incorporating technological development into the most dynamic economic areas, on the one hand, and, on the other, the demands triggered by the rise in the general standard of living, which are aimed at narrowing the gaps between social groups and thereby increasing social equity.

From the point of view of technological change, Gatto states that the new production paradigm, which he calls a neo-Fordian stage or stage of flexible accumulation, entails much more than a change of technical direction and technical underpinnings; it modifies the socio-institutional regulatory context, affects lifestyles and consumption patterns, and defines certain types of organizational and production practices (1989, p. 13). These major changes in production, organization, society and culture have led some social scientists to say that we are facing a third industrial revolution.

In this changing scenario marked by great interdependence among countries, some questions must be asked about the introduction of new technologies. In policy-making, for instance, it would be advisable to ascertain in what manner this process takes place, given the major shift to an institutional model in which the public sector, the private sector and the international centres all have a hand in the incorporation of new technologies, but in which the decision-making role of the public sector is steadily diminishing in most countries. This reduced power of the public sector is one of the reasons why it is so difficult to direct the technological process so as to promote the well-being of a broader population sector and to integrate it into the other components of national policy. New technologies have been introduced mainly via transnational corporations, especially where information technology is concerned. There is a continuing polemic as to whether it is the market that must allocate resources, while deregulating or reducing the levels of protection and the degree of State intervention; or whether, instead, government policies should partially determine industrial and technological structures and dynamics by shaping the industrial structure and regulating foreign investment and flows of technology by means of mechanisms such as the promotion of human resources, the utilization of the buying power of the State, and the use of instruments of intervention in foreign trade (Azpiazu, Basualdo and Nochteff, 1990).

This system of adopting technologies, in which the public sector does not play a fundamental or decision-making role, raises two further questions: What interests should prevail in the adoption, creation and adaptation of technologies? And how can one safeguard national interests and the interests of social groups with less power in the social structure —low-income women, for example— for whom an improvement in living conditions is imperative? The potential social repercussions of technical change are an important factor to be taken into account by governments in designing its institutional

framework in order to ensure that the State can represent the general public interest.

An examination of the region's experiences with the introduction of technological advances in the agricultural sector shows that in most countries the effect was greater polarization and heterogeneity in the structure of production. Despite the fact that these technologies give peasants more control over the technical conditions of the production process, it has not generally been found that poverty tends to be eliminated or even to diminish. Nevertheless, it has been argued that technology is not in itself the root cause of these untoward results but rather that the economic and social conditions under which this activity takes place are what lead to a lack of "neutrality" in the process of selecting and adopting technologies (Schejtman, 1988). According to Anderson (1988), technologies are bound up with society and transmit social values and institutional and cultural patterns, even as they make it possible to assess resource stocks and to organize production. Since technologies are devised in response to problems arising in the developed countries, they undoubtedly transmit the ideologies, values and ways of organization of the developed world. Hence, what the new technologies probably do is to "redefine" the socio-cultural context into which they are introduced as well as organizational and production requirements.

The lack of neutrality extends to the outlook on gender, since analyses and studies usually refer to the overall population without mentioning or analysing the gender-based division of labour. Consequently, in discussions of the need to train highly qualified human resources in order to integrate them into the technological process, there is generally no perception of the importance of studying the different situations of female and male human resources, the different environments in which their skills training takes place, or the contribution made by the "invisible" work performed by women in the training of human resources.

III. TECHNOLOGY AND PRODUCTION

Technology and production have other effects on social organization in the short and long terms. They produce changes that re-establish the distinctions made in respect of the productive aspects of what are customarily considered cultural phenomena. The persistence of inequitable patterns of social organization in general and of the radical asymmetry of the sexual division of labour in particular thus becomes apparent. The distinction between gainful employment and unpaid forms of labour, for instance, can systematically slant the way in which reality is perceived by suggesting that those who are gainfully employed are the only ones who are working and producing. These biases are crucial to an understanding of women's position of inferiority in society, especially where unpaid domestic labour is concerned. Also, the patterns of the sexual division of labour (and women's specialization in specific economic activities) can be seen as a partial reflection of the traditional division of labour within the home, which exerts a differential influence in terms of the development of certain skills and maintains the inequality of opportunities for acquiring "non-traditional" skills (Sen, 1985).

In general terms, it should be asked whether this sexual division of labour repeats itself in the acquisition of the skills needed to handle new technologies, or whether, on the contrary, this serves to generate new, less segregated patterns. In scrutinizing these changes, the manner in which a given social order is built up and disintegrates must be analysed, as well as the way in which gender ideologies that assign specific behaviour patterns to women take shape and endure, even when they are contradicted by a great mass of empirical data. We must also ask ourselves about the ideological mechanisms that exclude women from certain forms of skills training or attribute certain specific characteristics to technical work that make it either "feminine" or "masculine".

The trend towards the incorporation of the countries of the region into the process of technological development demands that they act with urgency to modify their educational systems and their systems of human-resource training in technological areas. There is a proverbial lag between the supply of skilled human resources and the demands of the economic system, a discrepancy compounded by the still greater difficulty of adapting to the increasing speed of technological change. As part of the effort to devise new ways of bringing the economic system and the educational system into line with each other, a system must be set up to eliminate open or subtle discrimination against women in the educational system in order to form a pool

of human resources that has actually been trained on the basis of aptitude.

Information technology (informatics) has been the dominant force affecting all aspects of production as it redirects industrial innovation towards electronically integrated manufacturing processes. At the same time, the logic and the standardized norms of mass production have been called into question by organizational innovations in plant and personnel management which favour flexibility, quality and co-operation over a strict division of labour or rigid production patterns. These two sets of innovations—in organization and in electronic integration—have substantially reduced costs and improved efficiency (United Nations Centre on Transnational Corporations, 1989).

Furthermore, as Gatto points out, optimum technological practices are founded on a greater degree of flexibility: flexibility in products and in the product mix, flexibility in terms of output volumes, flexibility in design, flexibility in production routines, flexibility in capital goods, flexibility in the labour process and so on (1989, p. 13). Given the need to respond flexibly to new market situations, changes are required in both "hard" technologies (equipment) and "soft" technologies (organization and management), at least in the following key areas of company operations: regrouping of the main functions, reorganization of the production process, and reformulation of production decisions relating to the integration of the stages of the production process.

These adaptations of the production system to the requirement of flexibility are summed up in the so-called "just-in-time" system developed by Japanese transnational corporations, which puts the emphasis on keying production to orders, redesigning machinery and the tasks of those operating them in order to develop various products rapidly and efficiently in small batches, modifying the organization of production to allow for a continuous flow of smaller batches of products and, lastly, reducing stocks to a minimum. To maintain this constant flow without maintaining inventories, the products must be entirely free of defects, that is, both the products produced in the firm and the inputs it receives must be of perfect quality. Strict quality-control requires preventive maintenance and a specific allocation of quality-control responsibilities among the various operators. This ultimately means that the lines of demarcation among the skills and aptitudes of the various workers become less sharp, since the workers are trained to respond to varying demands and are paid in accordance with their level of skill and the quality of what they produce.

Less rigidity in the technical division of labour could theoretically lead to greater flexibility among the various kinds of workers, be they men or women. It should be remembered that women possess a cultural advantage in respect of this kind of work because the enduring duality between their paid and unpaid work demands of them a constant flexibility and adaptability.

IV. TECHNOLOGY AND THE LABOUR MARKET

The new production paradigm briefly described in the preceding section raises the question of its possible impact on the labour market in general and on the female job market in particular. It is difficult to predict what kinds of repercussions the introduction of new technologies will have on the work situation of women, given the complexity of the work that women do, both inside and outside the home, a process in which the social and individual aspects are intimately interrelated. Furthermore, the recognition that technology has a social dimension also entails a recognition of the difficulty of measuring its effects (Montero, 1989).

Thus far, the full effects of new technologies on employment have not been perceived. It is usually said in this connection that technological progress increases manpower productivity; but it should also be said that the effects vary according to the kind of technological change and the pre-existing work conditions. A given innovation can reduce the skill level required of skilled workers (as, for instance, when work formerly performed by a craftsman is subdivided into various production steps), but it can also raise skill levels, as happens, for instance, in the case of a new labour force drawn from a rural population (Joeke, 1987). Most studies indicate that in assessing the impact of the introduction of new technologies on production, a clear distinction must be made between long-term and the short-term effects. In the short term, apparently, a great many posts traditionally occupied by women are cut back, while in the long term new opportunities are opened up for them (Escario and Alberdi, 1986).

Technological changes do not have the same effects on men as on women in terms of their work, and in some cases the effects are favourable to women while in others they are unfavourable. Analysing the situation in the developing world, Joeke (1987) distinguishes three levels in technological change, especially in the rural sector: improved tools accelerate manpower specialization and labour intensity; mechanization displaces manpower; and automation increases the degree of participation, attentiveness and preparation required of the labour force. In agriculture, for instance, the use of modern, high-yield plant varieties has generally had the effect of creating jobs, in that other stages are incorporated into the production process: fertilization, more careful tending of the land, and so on. Women could benefit from this additional source of employment on two accounts: 1) in those countries where there is a general or seasonal manpower shortage, women represent the only possible major source of

new manpower, and ii) some of the most labour-intensive activities, especially during the harvest, are classified as women's work, and in agriculture the customary pattern of the gender-based division of labour is observed. On the other hand, if it is the men who go to work in agro-industry, then women must take their place on the farms, which means that women's workloads will be increased while their own income may actually decline

Nevertheless, most of the studies done in the region on agro-industry indicate that it has indeed generated jobs for women, although it has also been noted that there is a great diversity among countries with respect to working conditions; despite this diversity, however, there are a number of constants, such as wage differences in comparison to men in the same occupations and the lack of social security and other benefits, the latter being a result of the seasonal nature of the work and the low level of organization of the women.

The question arises as to whether the introduction of new technologies (bearing in mind their main goal, which is to give flexibility to the production process) might not lead to the breakdown of the segmentation of the labour market by gender, and as to what direction that process might take. Some information reported in the region indicates that the division of labour by gender has grown sharper in the case of agro-industry. For instance, many employees make use of what are regarded as gender-linked aptitudes (Arizpe and Aranda; 1988, Aranda, 1988) in the production process, which has led to a strict segmentation of agro-industrial production patterns, with a resulting reorganization of the production process and a concentration of female labour in non-capital intensive tasks requiring a high level of dexterity (ECLAC, 1989a).

Furthermore, changes in the organization of the production process itself and the adoption of certain technologies make it possible to produce on a "decentralized" basis, that is, through the use of outside labour working far from the company facilities. This increased geographical flexibility creates a reorganizational potential that could considerably increase the participation of women in the labour force. This potential has been used in the "maquila" or in-bond assembly industry, in which transnational corporations "decentralize" production by transferring part of it to countries offering better physical-plant conditions and, especially, lower manpower costs (Arizpe and Aranda, 1988; Aranda, 1988). It has also been used in new forms of cottage industries, in which firms and female home workers are linked to each other through middlemen (subcontractors). The rationale underlying international decentralization and these cottage industries is to reduce labour, capital and overhead costs while increasing profits (Prates, 1983 and 1986).

Some research done in Spain has shown that in the service sector in that country the introduction of certain technologies has entailed the use of "gender" skills for the manual entry of information, an occupation that has been "feminized" and is therefore poorly paid. Thus, the training required for the new keypunching, recording and

verification tasks consists basically of learning to type rapidly. The task is repetitive and monotonous, and involves remaining very attentive, focusing one's vision and staying seated and immobile for many hours. These characteristics and the fact that the work is very badly paid result in women outnumbering men (Escario and Alberdi, 1986).

Other research done in Great Britain, consisting of three case studies on different working environments —the garment industry, mail order sales, and State welfare services (health)— reaches the general conclusion that technological change in itself does not affect the age-old pattern by which men, rather than women, are the ones who have the know-how and technical skills (Cockburn, 1985). In terms of the changes produced within the firms in question, the study indicates that new technology undoubtedly provokes an upheaval in the workplace, a redefinition of posts and boundaries between them, and a movement of workers —men and women— into and out of the labour market and from one type of work to another. From the point of view of gender, however, when the situation returns to normal after the technological revolution, the old masculine-feminine model is re-established (Cockburn, 1988, p. 97). This conclusion suggests possible courses of action during the "upheaval" provoked by technological innovation in order to shift the distribution of the new posts created by the technological change, as well as of the occupations not affected by the change, towards a more equitable participation by men and women. Otherwise put, in the matter of technological policy, a situation of "late industrialization" offers as yet unexplored opportunities for technological learning and for the incorporation and dissemination of technologies (ECLAC, 1990).

Little is known of the effect on employment in the service sector, where the situation is complex. In the developed countries, great quantities of domestic appliances have been produced and sold, and there has been a trade-off between services and domestic appliances owing to the relatively high cost of personal services (Byceson, 1985). In the developing countries, this trend has been much less pronounced because services are very cheap owing to the existence of the informal labour market. The question remains open as to whether the informal labour market will be competitive with automated services and domestic appliances produced by more automated methods of production. A preliminary, very tentative, conclusion is that the pattern in the region will continue to be a combination of an informal sector with a modern automated sector and that the segmentation of these markets will be maintained, although, on occasion, some advantage will be drawn from this situation.

Some preliminary data on Latin America show that of the nine countries of the region on which information was compiled, participation by women increased in eight of them in the area of activity entitled finance, insurance and real estate between 1960 and 1980 (ECLAC, 1989b). A study on Argentina indicates that the higher number of women now employed in banks is due, in the case of State banks, to

a drop in salaries that caused the male population to seek employment in the private banking system. However, this phenomenon could also be attributed to a change in the demand profile, since the incorporation of technologies increased employment in certain occupations that were created or were conceived of as "typically feminine". The largest proportion of new women workers is employed in the area of information systems (computation and telecommunications), where the policy has explicitly been one of greater acceptance of the employment of women. Those working in this area are young and have university training and a "more modern" mentality, facts which are adduced to explain why there is less resistance to the incorporation of women (García *et al.*, 1989).

This information, although partial, seems to indicate a change in the internal composition of the tertiary female sector whereby an increase in the participation of women in the area of modern services, especially banking and finance, has been coupled with the increase in the sector of traditional personal services which has been triggered by the crisis.

In addition, it is necessary to study the changes being brought about by the process of technological modernization within the public sector in order to determine if the trend is still for that sector to lag behind the private sector in terms of technology. The public sector, in which drastic reorganizations and cutbacks have been registered in various countries of the region, has traditionally employed large numbers of women; an in-depth study is therefore needed to detect regional trends. In a recent research project on the public sector in Argentina, a growing "feminization" of employment was observed which the authors attribute to the steady drop in wages in relation to the wages paid by the private sector (García *et al.*, 1990).

V. TECHNOLOGY AND REPRODUCTION

Reproduction is the area in which the impact of technology needs to be examined the most carefully, in order to determine how this impact is expressed in daily life, especially in the lives of women.

The fact that a conceptual vacuum exists, whereby women's reproductive role is not considered in policy analyses and design, has important practical consequences. The failure to take into account explicitly the reproduction and maintenance of human resources has a negative impact on women. Women's unpaid work is implicitly considered to be elastic, i.e., it can be stretched to compensate for any other deficit in available resources for human reproduction and maintenance. However, women's work is not infinitely elastic: it can reach a breaking point, and a woman's capacity to reproduce and maintain human resources can be destroyed. This cost will be "invisible" to macro-economic policy-makers, because it is "unpaid" time. But it will be reflected in statistics on the nutritional status and health of women and their children (Elson, 1990). The repercussions of crisis-oriented adjustment policies on the mental and physical health of women and the population in general have been underreported in studies on the impact of the crisis; this adjustment process—which has hurt the poorest sectors of women in the region—has been called "invisible adjustment".

Human reproduction and health technologies in general affect women the most. This fact is demonstrated by the drop in infant mortality rates and the use of modern birth control methods, both in developed and in developing countries. Many studies exist, for example, on the use of contraceptive methods—a highly complex technology—which indicate that the great majority of women at least know about these methods, although their use may be restricted to certain social groups. Moreover, a series of questions are now being raised about *in vitro* reproduction and its positive and negative effects of all kinds, whether ethical, social, economic or political.

The separation between reproduction and sexuality has been an important step forward for women. At present, the alternatives offered by new reproduction techniques (echography, amniocentesis, mammography, etc.), by solving problems that until recently still existed, are paving the way to new kinds of freedom for women, although for the time being they may only benefit a small group of women in the higher social sectors.

Nevertheless, a number of neglected areas remain to be studied in relation to changes in the lifestyles of the population, such as

changes in the types of domestic work where technology has had an influence. Certain studies show that the introduction of technologies in this environment has not changed the traditional division of labour by gender, but that technological change has helped to recreate the role of women as reproducers, and that technological innovation has not even resulted in a reduction in the number of working hours, but rather in a decrease in physical effort (Arriagada, 1990). If the situation of paid domestic work is analysed, for example, it can be seen that the use of computerized domestic appliances in the home and the new forms of organizing domestic servants (including certain contractual forms of full time or independent domestic work) do not change the occupational segregation of this type of work, which is mainly done by women. Some doubt remains as to whether technological innovation is helping to make the occupational roles of men and women, especially their domestic roles, more flexible, or whether, on the contrary, it only tends to complicate the double working day of women who are also employed outside the home. It could be hypothesized that, since technology is more closely related to men, introducing it in the home would mean that only men would use it. On the other hand, if the ideological mechanisms for assigning housework to women remained in operation, with or without technology, women would be the ones who would do the work anyway.

From the standpoint of production and reproduction, there is a broad field not only for research but also for the implementation of policies to change the present situation of inequality and lack of equity between men and women. Changes stemming from technological development, placing an emphasis on flexibility and the exchange of workers, provide an opportunity to make an ideological turnaround in the allocation of jobs by gender. The flexibility in terms of work schedules, the lack of continuity in the job market and the permanent shared responsibility between work within and outside the home which characterize women's work has been interpreted as weakness and uncertainty compared to men's work (Guerra, 1990). Given the new circumstances, this flexibility could become a key element in the effort to incorporate women into the jobs generated by the introduction of new technologies. However, the challenge lies in transforming this source of weakness into strength. This requires learning from the experience of the developed countries and making sure that the new technologies do not contribute to the reformulation of a subordinate position for women.

VI. SUGGESTED RESEARCH

The following is a brief summary of general guidelines for designing research projects on the possible effect of the new technologies on the situation of women, in particular with respect to production and reproduction.

In view of the diversity of the region, the research should include three advance steps: i) analysis of the situation of the countries in which new technologies have been incorporated, so as to assess the overall effect of these technologies on current structures of production in the region and the female workforce; ii) in each case, separation of the forms in which the technologies were introduced, especially in relation to the nature of the organization of production, e.g., subsidiaries of transnational corporations, installation of inbond assembly industries, subcontracting systems and other forms; and iii) selection of those countries in which the greatest amount of technology has been introduced, and selection, in each country, of the most representative companies for purposes of the study.

A. ASPECTS OF PRODUCTION

For purposes of analysis, the public and private sectors must be separated from one another, and those sectors in which new technologies have been introduced must be identified. From this standpoint, a distinction must be drawn between the formal and informal sectors; foreign and domestic corporations; enterprises which employ paid labour and others which employ cottage-industry workers; and corporations and co-operatives. Ideally speaking, the research should select enterprises of various types for the sake of comparison, and once the selection has been made, the following aspects of each type of enterprise should be investigated:

1. Production process and incorporation of new technologies. Within this line, the area of production in which technology has been introduced must be clearly identified. The type of technology ("hard" or "soft") must be determined; and in the field of microelectronics, where genetic engineering is concerned, it must be determined whether new materials are incorporated or if new types of energy are being used.

2. Changes concerning the level of employment. It must be determined whether technological changes have generated employment or if they have caused jobs to be lost. Changes in demand for labour in terms of age, skills and gender must be studied.

3. Evaluation of the impacts of the new technologies:

a) Modifications of the type of work being done. It must be determined whether another type or the same type of work is being done, and what changes have been made in the way this work is carried out. It must be ascertained whether there have been increases in the productivity of men and women.

b) Changes in the wages of men and women. In the areas of production in which new technologies have been introduced, the wage restructuring of the same jobs done by men and women, as well as new jobs defined as "female" or "male", should be examined.

c) Need for training of men and women. In each enterprise, requirements for training the workforce, and the number of men and women who have received training within the enterprise should be studied. The characteristics of the process for selecting which staff members are to be trained should also be analysed.

4. Comparative analysis of the differences among enterprises on the basis of the above-mentioned indicators.

B. ASPECTS OF REPRODUCTION

This is the most complex area to be analysed, because the inter-relationship among various types of phenomena makes it difficult to perceive changes and identify the areas in women's daily lives that are affected by technological changes. As far as possible, the following three dimensions of reproduction need to be treated separately:

1. Effect on the process of biological reproduction. The forms of acceptance and use of birth control methods by women belonging to different social sectors, and the existing coverage of new advances in reproductive medicine for the different social sectors of the population need to be studied. The lack of possibilities for the use of such methods by certain sectors, and excessive use by other sectors should be analysed. Experiences with *in vitro* fertilization and the use of laser techniques and their applications in reproductive medicine, as well as their effects on the reproductive role of women should be investigated.

2. Technological impacts on domestic work. Women should be separated by social sector and, within these sectors, a distinction should be drawn between three groups of women: women working within and outside the home without domestic help; women working outside the home, but who have domestic help; and women working in the home without domestic help. In the various cases, the forms of technological incorporation for performing domestic work should be analysed. The effects of technology on domestic work and the possibility of

making roles within the household more flexible should be determined. A study should be made of the possible effect of lowering the number of hours devoted to domestic work, especially in terms of replacement of paid domestic work. This means finding out, in the context of new conditions, who does what and how long it takes. The effect of domestic appliances on the demand for domestic employees and on their wages should also be studied.

3. Impacts on the social reproduction process, analysis of communications media and socialization. This involves analysing women's perception of technology, including their willingness or lack of willingness to use and consume the fruits of technology, and their interest in studying technology or working in jobs involving the use of new technologies. Together with this, a study should be made of the views of businessmen and employers in general with regard to the incorporation of new technologies, i.e., whether they accept or reject them, and their reactions to employing women in positions where these new technologies are used. The ways in which the new technologies are shown in the communications media should be analysed. It should be determined whether stereotypes persist with regard to who should use certain technologies, and whether the introduction of technologies changes the ideological characterization of the process of women's work as defined by the following dimensions (Lobo, 1986): less physical force required, less difficulty or complexity, more clearly marked repetitiveness, predominance of manual tasks, management of longer series, need for greater speed, and more sedentary nature. In specific relationship to technologies, a distinction needs to be drawn between external manipulation of machines by women and internal manipulation of machines by men.

Studies should be developed on technology's effect on the situation of women based on the dual aspect of that situation —production and reproduction. This would fill a significant lacuna in research on the subject and could provide a basis for the formulation of policies aimed at re-evaluating the role of women in society on the one hand, and increasing social equity on the other, in that the goal would be to make the roles played by men and women in society more flexible. What has been thought of as weakness (the extreme flexibility of women's work) should be transformed into an element of strength; the need for flexibility in the new production processes that incorporate technology is a challenge that must be faced from now on.

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