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WOMEN IN INDUSTRIAL DEVELOPMENT IN DEVELOPING COUNTRIES: TRENDS AND PERSPECTIVES *

Prepared by

Unit for the Integration of Women
into Industrial Development

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Preface

The study was prepared as a contribution by UNIDO to the 1989 World Survey on the Role of Women in Development (ST/CSDHA/6, United Nations Publication, Sales No. E.89.IV.2).

It is based on work undertaken by Ms. Swasti Mitter, a UNIDO consultant, in co-operation with the staff of the Unit for the Integration of Women into Industrial Development.

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A. Present role of women in industry

Research on women in development in the 1980s indicates that women make up a significant proportion of the labour force in both agriculture and industry in most countries. 1/ In 1985, the number of women workers in the industrial sector was over 166 million and showed signs of further increases.** More than half of these workers were in developing countries. In the developing countries, trends in the 1980s indicate that, numerically, the proportion of women in the industrial labour force has increased to the point where, in some places, it is higher than in any developed country. For example, in Haiti, the Philippines, the Republic of Korea, Singapore and Thailand, women's share in manufacturing employment is more than 40 per cent, and in Hong Kong, the Taiwan Province of China and Tunisia, their share is about 50 per cent, while in no developed market economy do women account for more than 31 per cent. 2/ In the formal sector, women have entered the manufacturing labour force in ever-increasing numbers. They also contribute significantly as invisible, hidden or unregistered workers in the informal production sector. Although the informal sector is frequently ill-defined, women's work within it provides vital labour for international as well as national markets, and their role is often far more important, numerically speaking, than men's.

Women's entry into the industrial labour force has had both positive and negative effects on women. On the positive side, industrial employment offers women an entry into paid employment and, at times, greater bargaining power and entitlement to familial and societal resources. This increased participation has brought greater recognition of women's important contribution to economic growth and development. It has made researchers, decision makers and administrators pay more attention to women's employment experiences, especially in manufacturing sectors where growth and expansion has occurred because of the presence of females who can be rapidly trained and are willing to work for lower wages. 2/

Employment in manufacturing, especially in developing countries, has not always been positive for women. While there have been gains in terms of overall employment in industry, women have yet to be integrated into all occupations and sectors and to obtain conditions and content of work comparable to men's. In addition, women account for a disproportionate share of unemployment in most countries (as examined in section B, below), have more limited access than men to jobs generally (especially at the higher occupational levels) and have greater difficulty in securing adequate technical training or even information on finding and applying for available jobs.

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*Prepared by the United Nations Industrial Development Organization.

**Calculated approximately on the basis of the economically active female population in 1985 (table 9) and the share of the female labour force in the industrial sector in 1980.

In this chapter, the role of women in industrial development in developing countries in the 1980s is analysed. Special attention is given to economic, industrial and social factors influencing women's employment and to issues and policy options instrumental in reshaping present-day trends in industry. Emphasis is placed on the creation of effective human resource measures designed to prepare women better for manufacturing employment and to upgrade and enhance the quality of that employment.

The current and future labour force, regardless of gender, would benefit from education and training that better corresponds to the skills and abilities needed for employment opportunities, the creation of more humane working conditions, and open access to the industrial market-place. Structural shifts in the international market and technological advances in industry suggest that developing countries can no longer rely primarily on an available supply of cheap, unskilled labour to promote industrial growth. Consequently, human resource planning and policy-making based on the type of analysis and information presented here is likely to assume greater importance for both women and men in coming years.

B. Recent trends in women's manufacturing employment

1. Employment of women in manufacturing world-wide

The emergence of women as a major industrial work-force, particularly during the United Nations Decade for Women: Equality, Development and Peace, has posed contradictory problems for researchers and policy makers. Although there have been positive aspects of women's entry into the industrial employment market, there have also been disturbing ones. For example, the majority of female industrial workers are employed in occupations that are ill-paid and repetitive and that have poor career prospects. Moreover, a vast number of women have found employment in industrial sectors that are being automated. Only a few industries, such as electronics, food-processing and textiles, have actively sought and recruited women workers for unskilled and semi-skilled jobs. These jobs require little training, and hence those industries can rely on a work-force that has the image of being prone to a high turnover. The share of women in management and highly skilled occupations has continued to remain insignificant.

It is difficult to estimate the number of women engaged in manufacturing activities. At best, the number of women employed in the formal industrial sector has been underestimated in official decenial household censuses and national industrial surveys. This has been due to the way in which employed household workers are defined and classified in household surveys; the lack of gender-specific employment information collected during industrial surveys; and inadequate co-ordination between government agencies that collect information related to women in industry and industrial classification schemes

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*For a discussion of trends in women's manufacturing employment 1960-1980, see "The role of women in industrial development", World Survey on the Role of Women in Development (United Nations publication, Sales No. E.86.IV.3), part three.

that exclude industrial branches in which women tend to be employed. In addition, the informal manufacturing sector has not been well-defined, and employment in it has not been documented. Research indicates that significant numbers of women work in the informal sector and that their numbers are increasing. While concepts and indices are being devised to permit more precise measurement of women's participation, until accurate data are available, statistics on women employed in manufacturing should be regarded as underestimates.

Even with a bias towards underestimation, the participation of women in the manufacturing sector of the developing countries increased between 1960 and 1980, 3/ and this trend appears to have continued in the 1980s. In the present study, country-based statistics, however incomplete, have been used to identify recent changes. In Africa, the share of manufacturing in total employment has remained generally lower than that of developing countries in Asia, yet some changes are discernible (table 1). Mauritius, for example, experienced a rapid growth in industrial employment, which was made possible because of the entry of women into the manufacturing sector, particularly in export processing zones. In Egypt, the overall share of manufacturing employment remained constant between 1980 and 1985, yet the participation of women in manufacturing employment increased dramatically. Women have also made progress in manufacturing employment in Latin American and the Caribbean countries, with the exception of Barbados. In contrast, women's employment opportunities in some Asian countries have shown signs of stagnation, partly because of the declining scope for export-led growth.

Table 1. Employment, manufacturing in total employment and women's share in manufacturing, 1980 and 1985 a/

Region and country or area	Year	Total employed b/ (Thousands)	Share of manufacturing c/ in total employment (Percentage)	Share of women in total manufacturing (Percentage)
Africa				
Botswana	1980	83.4	6.7	16.1
	1985	117.2	8.6	26.7
Egypt	1980	9 791.1	14.7	5.2
	1983	11 526.0	14.7	15.0
Kenya	1980	1 005.8	14.0	9.3
	1985	1 174.4	13.5	9.9
Mauritius	1980	197.561	18.4	56.1
	1985	215.354	29.2	62.0

continued

Table 1 (continued)

Region and country or area	Year	Total employed b/ (Thousands)	Share of manufacturing c/ in total employment (Percentage)	Share of women in total manufacturing (Percentage)
America				
Barbados	1980	99.3	15.2	58.9
	1985	92.1	13.0	54.2
Bermuda	1980	29.669	3.6	34.7
	1985	32.190	3.6	35.2
Costa Rica	1980	724.71	16.3	29.6
	1985	826.70	15.9	31.8
Cuba	1980	2 606.6	21.7	25.7
	1985	3 163.6	22.0	30.7
Puerto Rico	1980	760	18.6	46.1
	1985	758	17.9	46.3
United States	1980	99 303	22.1	31.5
	1985	107 150	19.5	32.3
Asia				
Cyprus	1980	200.1	19.9	46.1
	1984	220.4	20.0	45.6
Hong Kong	1980	2 237.8	42.1	45.3
	1985	2 543.3	36.1	46.5
India	1980	22 305	26.3	9.6
	1984	24 142	25.6	9.5
Japan	1980	55 360	24.7	38.6
	1985	58 070	25.0	39.5
Korea, Republic of	1980	13 706	21.7	39.3
	1985	14 935	23.4	38.7
Philippines	1980	17 154	10.8	47.1
	1985	20 327	9.5	48.7
Singapore	1980	1 068.9	29.2	46.0
	1985	1 154.1	25.5	44.3

continued

Table 1 (continued)

Region and country or area	Year	Total employed b/ (Thousands)	Share of manufacturing c/ in total employment (Percentage)	Share of women in total manufacturing (Percentage)
Sri Lanka	1980	1 078.4	16.7	31.0
	1984	956.5	20.8	37.8
Europe				
Czechoslovakia	1980	7 358	34.5	43.2
	1985	7 606	34.0	43.0
Germany, Federal Republic of	1980	25 797	34.3	29.6
	1985	25 000	32.0	29.3
United Kingdom	1980	24 984	28.4	29.1
	1985	24 071	23.8	28.2
Yugoslavia	1980	5 682	36.4	36.1
	1985	6 378	37.8	38.0

Source: International Labour Organisation, Yearbook of Labour Statistics, 1986 (Geneva, 1986), table 3 B.

a/ Unless otherwise indicated.

b/ The "employed" comprise all persons above a specified age who during a specified brief period, either one week or one day, were in the "paid employment" or "self employment" categories. For a more detailed description, see the source, p. 289.

c/ Manufacturing includes all activities under major division 3 of the International Standard Industrial Classification of all Economic Activities (ISIC-1968).

The experiences of the developed countries, as the figures in table 1 indicate, have been somewhat different. In the Federal Republic of Germany, the United Kingdom of Great Britain and Northern Ireland and the United States of America, women lost out in the manufacturing sector in terms of the total number employed, although they increased or practically maintained their overall share. The rate of displacement was generally higher for men than for women in the manufacturing sector in the developed countries, with the exception of Japan where women's employment made both numerical and proportional gains in manufacturing. This can be attributed to the growth of part-time work in the sector in Japan.

The evidence from Yugoslavia shows the increased importance of women in the manufacturing sector of countries with centrally planned economies. Generally, statistics for the early 1980s indicate that women in these countries represent a significant proportion of industrial-sector employment (e.g. 49% in the Union of Soviet Socialist Republics, 48.5% in Bulgaria, 41.6% in the German Democratic Republic and 30% in Czechoslovakia). While women were employed in all industrial sectors, the highest concentration was in light industry and the metal trades. 4/

Women's share of employment in major industrial groupings in selected countries in 1981, 1983 and 1985 is shown in table 2. The main sources of employment for women in most countries are in the following industries: textiles and clothing, food processing, chemical products, printing and publishing, and electrical machinery and apparatus, a sub-sector of the electronics industry. The statistics in table 2 show that in all countries surveyed, the highest percentage of women among the workers in a given industry was found in the textile and wearing apparel sectors, but there are variations between countries in other sectors. In Cuba and Czechoslovakia, for example, over 30 per cent of the employees in wood and cork industry are women, but the feminization of this industry is weaker in other countries. Women are substantially represented in the iron and steel industries in Czechoslovakia, whereas in most other countries, these industries are predominantly male.

2. Hours worked, wages and occupations of women in industry

It is important to examine not only changes in the percentage of women employed in industrial sectors but such variables as hours worked, wages earned and occupational levels. While it is beyond the scope of the paper to assess the quality of women's work-life accurately, these variables provide important information on women's actual position in industry and indicate areas that may need special attention from policy makers and researchers to enhance women's overall participation.

As can be seen from table 3, there has not been any perceptible fall in the number of hours worked by women from 1981 to 1985; in fact, there has been an increase over the period in a few countries. Except in El Salvador and the Republic of Korea, women work fewer hours per week than men. These figures do not reflect, however, the double workload of employed women who also perform household chores and, frequently, unpaid family work, particularly in developing countries. Men's share in both household and unpaid family work remains small.

A comparison of wage rates and earnings (table 4) for males and females employed in manufacturing industries reveals some little progress and the record for some Asian countries justifies cautious optimism.

The general picture remains unaltered, however, in that in both the developed and the developing countries women on average earn far less than men, from 42.1 per cent of male earnings in Japan to 81.5 per cent in El Salvador, with the single exception of the United Republic of Tanzania, where women earned 1.5 per cent more than men in 1980.

Table 2. Women's share of employment in major industrial groupings in selected countries, 1981, 1983 and 1985

Region and Country	Year	Food (311-312)		Textiles (321)		Wearing apparel (322)		Wood and cork (331)		Printing, publishing etc. (342)		Other chemical (352)		Other non-metallic (369)		Iron and steel (371)		Electrical machinery etc. (383)	
		Total (thousands)	Percentage of females	Total (thousands)	Percentage of females	Total (thousands)	Percentage of females	Total (thousands)	Percentage of females	Total (thousands)	Percentage of females	Total (thousands)	Percentage of females	Total (thousands)	Percentage of females	Total (thousands)	Percentage of females	Total (thousands)	Percentage of females
Africa																			
Botswana	1981	2.436	8.4	1.075	55.7	..	..	0.368 b/	5.4	0.134 c/	30.0	0.149 d/	24.8	..	..	..	..	0.453 g/	8.6
	1983	2.510	14.2	1.678	59.4	..	..	0.321 b/	6.9	0.500 c/	25.8	0.426 d/	8.5	..	..	..	..	1.812 g/	5.4
	1985	3.238	15.8	1.549	68.8	..	..	0.389 b/	11.8	0.521 c/	53.0	0.301 d/	18.6	..	..	..	..	1.999 g/	16.0
Kenya	1981	34.74	18.4	21.85	12.4	6.69	23.9	8.92	7.8	4.45	11.2	1.78 e/	5.6	4.53	4.4	2.20 f/	4.5	1.71	11.7
	1983	35.98	13.1	21.51	9.8	6.81	22.0	8.65	6.9	4.81	12.5	1.82 e/	5.5	4.29	4.7	1.97 f/	5.1	1.95	..
	1985	41.51	..	22.82	..	7.68	..	7.85	..	5.19	..	1.94 e/	..	4.89	..	2.19 f/	..	2.23	..
Mauritius	1981	2.680	26.5	2.109	51.6	19.353	87.0	1.000 b/	13.1	1.105	19.0	1.048 h/	21.0	1.388	6.6	0.359	1.1	0.455	22.0
	1983	2.854	25.3	2.304	49.0	19.677	87.3	1.154 b/	14.8	1.086	19.6	1.118 h/	19.9	1.222	6.9	0.368	5.7	0.557	24.8
	1985	3.128	27.5	2.678	42.1	42.393	77.2	1.218 b/	15.2	1.002	21.8	1.142 h/	19.4	1.206	7.3	0.327	5.5	0.591	24.3
Zimbabwe	1981	24.8	7.2	18.8	9.0	16.8	20.0	6.8	2.9	5.6	10.7	4.7	8.5	6.9	1.4	15.5	1.3	5.2	7.7
	1983	27.4	7.3	20.0	7.0	16.0	19.0	7.1	2.0	5.8	12.1	4.9	8.2	6.7	3.0	12.8	2.3	5.5	5.5
	1985	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
America																			
Colombia	1981	73.44	28.0	64.37	33.6	50.04	81.0	5.70	12.3	20.20	30.9	23.71	43.7	20.82	7.3	14.30	7.1	14.00	13.4
	1983	75.90	30.3	52.80	35.3	45.98	81.0	5.04	12.3	19.62	30.8	23.19	42.2	21.22	7.8	12.89	6.8	15.88	27.6
	1985	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Cuba	1981	198.6	17.1	19.0	44.2	28.7	80.0	17.7 b/	28.2	11.5	27.0	..		3.2 i/	31.3	8.0	15.0	1.6	29.4
	1983	246.4	20.7	22.5	51.5	29.5	84.0	15.2 b/	34.9	8.6	37.2	..		5.8 i/	34.4	8.8	17.0	13.0	33.8
	1985	263.2	21.0	28.4	42.6	31.7	84.0	15.6 b/	34.6	10.4	38.5	19.0	43.7	6.7 i/	35.8	6.7	19.3	14.6	35.6
United States	1981	1 438	31.9	823	47.5	1 244	81.0	666	12.2	1 266	40.0	503	35.6	456	15.0	707	8.3	2 094	42.6
	1983	1 392	32.7	741	47.6	1 163	81.0	657	14.8	1 299	40.9	492	36.0	412	14.8	480	8.3	2 013	42.2
	1985	1 382	32.8	704	47.9	1 125	80.0	700	15.3	1 435	42.2	512	36.5	447	15.4	448	9.0	2 207	41.9
Asia																			
Hong Kong	1981	17.27	21.8	122.62	49.4	259.71	68.0	6.96	16.5	28.51	18.8	5.92	39.4	2.15	7.9	3.06	7.2	124.81	62.8
	1983	16.37	23.6	111.34	46.8	268.94	69.0	5.74	14.8	27.36	20.7	5.86	36.5	2.60	6.2	1.59	6.3	131.57	62.8
	1985	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
India	1981	607	28.2	1 831	7.3	37	24.0	46	10.9	159	3.1	482 j/	9.3	201	10.0	427	3.3	346	7.2
	1983	677	23.3	1 823	7.1	42	33.3	44	9.1	164	3.7	518 j/	10.4	205	9.3	424	3.5	361	7.8
	1985	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Korea Republic of	1981	121.5	41.2	394.6	68.0	215.1	77.6	43.8	27.6	45.7	26.0	49.2	38.4	49.9	18.0	67.7	5.9	213.0	55.2
	1983	140.3	43.3	386.1	64.4	226.3	74.0	43.2	23.4	52.4	26.7	55.8	37.1	51.8	16.6	73.0	6.4	252.5	53.0
	1985	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..

continued

Table 2 (continued)

Region and Country	Year	ISIC major group a/	Food (311)-312)		Textiles (321)		Wearing apparel (322)		Wood and cork (331)		Printing, publishing etc. (342)		Other chemical (352)		Other non-metallic (369)		Iron and steel (371)		Electrical machinery etc. (38)	
			Total (thousands)	Percentage of females	Total (thousands)	Percentage of females	Total (thousands)	Percentage of females	Total (thousands)	Percentage of females	Total (thousands)	Percentage of females	Total (thousands)	Percentage of females	Total (thousands)	Percentage of females	Total (thousands)	Percentage of females	Total (thousands)	Percentage of females
Sri Lanka	1981		35.57	28.9	36.76	54.8	21.89	90.0	5.01	5.2	6.51	6.8	5.73 b/	18.0	12.32	11.9	0.43	16.3	3.12	21.5
	1983		33.35	29.9	30.77	48.1	20.14	90.0	6.24	5.2	7.13	5.3	5.75 b/	19.0	9.71	10.8	0.15	26.7	1.88	35.6
	1985		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Europe																				
Czechoslo-vakia	1981		129.4	50.0	176.1	69.1	87.7	84.0	52.7	39.1	23.3	48.0	16.4	57.3	65.7	23.4	119.3	22.3	104.4	52.8
	1983		130.1	49.8	173.5	69.2	86.2	84.0	51.7	38.9	22.4	48.6	15.9	56.0	64.9	23.1	118.7	22.7	104.0	51.8
	1985		131.2	49.6	171.2	69.3	85.3	84.0	50.6	38.1	21.0	49.0	16.3	55.8	63.8	23.0	124.9	23.2	110.5	51.0
Germany, Federal Republic of	1981		766 1/	41.5	722 m/	66.3 m/			481 b/	20.2	481 c/	38.7	956 d/	28.0	292 j/	24.5	693 f/	17.5	3 730 g/	23.0
	1983		717 1/	42.5	633 m/	67.7 m/			448 b/	20.8	465 c/	37.4	878 d/	27.7	268 j/	24.3	543 f/	17.8	3 588 g/	22.7
	1985		717 1/	42.5	633 m/	67.7 m/			448 b/	20.8	470 c/	37.7	878 d/	27.7	268 j/	24.3	543 f/	17.8	3 591 g/	22.7

Source: International Labour Organisation, Yearbook of Labour Statistics, 1986 (Geneva, 1986), table 5 B.

Note: The divisions and major groups were selected based on (a) the availability and consistency of data; (b) their importance in the total economy; and (c) their significance for women's employment.

a/ The International Standard Industrial Classification of all Economic Activities (ISIC-1968) consists of major divisions (one-digit code), divisions (two-digit codes), and major groups (three digit codes). Major division 3, manufacturing, is broken down as follows:

31		Manufacture of food, beverages and tobacco
	311-312	Food manufacturing
	313	Beverage industries
	314	Tobacco manufactures
32		Textile, wearing apparel and leather industries
	321	Manufacture of textiles
	322	Manufacture of wearing apparel, except footwear
	323	Manufacture of leather and products of leather, leather substitutes and fur, except footwear and wearing apparel
	324	Manufacture of footwear, except vulcanized or moulded rubber or plastic footwear
33		Manufacture of wood and wood products, including furniture
	331	Manufacture of wood and wood and cork products, except furniture
	332	Manufacture of furniture and fixtures, except primarily of metal
34		Manufacture of paper and paper products, printing and publishing
	341	Manufacture of paper and paper products
	342	Printing, publishing and allied industries
35		Manufacture of chemicals and chemical, petroleum, coal, rubber and plastic products
	351	Manufacture of industrial chemicals
	352	Manufacture of other chemical products
	353	Petroleum refineries
	354	Manufacture of miscellaneous products of petroleum and coal
	355	Manufacture of rubber products
	356	Manufacture of plastic products not elsewhere classified
36		Manufacture of non-metallic mineral products, except products of petroleum and coal
	361	Manufacture of pottery, china and earthenware
	362	Manufacture of glass and glass products
	369	Manufacture of other non-metallic mineral products
37		Basic metal industries
	371	Iron and steel basic industries
	372	Non-ferrous metal basic industries
38		Manufacture of fabricated metal products, machinery and equipment
	381	Manufacture of fabricated metal products, except machinery and equipment
	382	Manufacture of machinery except electrical
	383	Manufacture of electrical machinery apparatus, appliances and supplies
	384	Manufacture of transport equipment
	385	Manufacture of professional and scientific and measuring and controlling equipment not elsewhere classified, and of photographic and optical goods
39	390	Other manufacturing industries

b/ Includes all of division 33
c/ Includes all of division 34
d/ Includes all of division 35
g/ Includes all of division 38
f/ Includes all of division 37
g/ Major group 355 only.
h/ Major groups 351-356.
i/ Includes all of division 36
j/ Major groups 361-362 only
k/ Major groups 352-356 only
l/ Included in division 31
m/ Includes all of division 32

Table 3. Hours of work by male and female workers in the manufacturing sector, 1981-1985

Country or area	1981	1982	1983	1984	1985
Costa Rica a/					
Total	48.5	48.0	49.3	42.5	43.0
Cuba a/					
Total	42.2	41.8	43.1	43.2	43.4
Czechoslovakia a/					
Total	43.3	43.1	43.1	43.0	43.1
Cyprus b/					
Males	42	42	42	42	42
Females	40	40	40	40	40
Total	41	41	41	41	41
El Salvador a/					
Males	44.5	44.2	44.0	44.0	44.0
Females	44.1	44.1	44.0	44.0	44.0
Germany, Federal Republic of b/					
Males	41.6	41.1	40.8	41.4	41.1
Females	39.4	39.1	39.1	39.7	39.5
Total	41.1	40.7	40.5	41.0	40.7
Gibraltar b/					
Males	48.1	49.0	49.2	51.9	48.8
Females	41.1	41.4	40.7	42.0	41.2
Total	46.9	47.7	47.6	50.4	48.7
Greece b/					
Males	40.9	39.6	39.2	39.0	40.0
Females	37.7	37.2	37.7	37.2	38.3
Total	39.5	38.6	38.5	38.2	39.3
Hong Kong a/					
Total	46.2	45.2	45.5	44.8	44.8
Israel a/					
Males	40.1	39.0	38.9	39.3	39.7
Females	35.1	34.9	35.0	35.4	35.3
Total	39.0	38.1	38.0	38.5	38.6
Japan a/					
Males	42.1	42.1	42.3	43.0	42.9
Females	38.3	38.3	38.6	38.8	38.4
Total	41.0	40.9	41.1	41.7	41.5

continued

Table 3 (continued)

Country or area	1981	1982	1983	1984	1985
Korea, Republic of a/					
Males	53.4	53.6	53.9	54.0	53.5
Females	53.9	54.0	55.0	54.8	54.2
Total	53.7	53.7	54.4	54.3	53.8
Panama a/					
Total	45.5	..	46.1	..	..
Puerto Rico b/					
Total	38.2	37.5	38.7	38.7	38.4
Singapore a/					
Males	51.9	50.5	50.6	50.7	49.0
Females	46.2	46.4	47.5	46.9	45.5
Total	48.7	48.3	48.9	48.6	47.0
Sri Lanka b/					
Males	53.6	48.2	49.6	49.9	53.6
Females	47.7	40.1	45.4	44.3	42.4
Total	52.6	46.5	48.9	48.6	47.4
USSR a/					
Total	40.7	40.4	40.3	..	..
United Kingdom a/					
Males	42.0	42.0	42.5	42.8	43.0
Females	37.5	37.8	38.1	38.1	38.1
Total	-	41.0	41.5	41.7	41.8
United States					
Total	39.8	38.9	40.1	40.7	40.5

Source: International Labour Organisation, Yearbook of Labour Statistics, 1986 (Geneva, 1986), table 12A.

a/ Hours actually worked.

b/ Hours paid for.

Table 4. Wage rates and earnings for male and female manufacturing workers in selected countries, 1980, 1984 and 1985

Region and country	Currency	Rate a/	1980 Male	1980 Female	1980 Ratio of female to male (percentage)	1984 Male	1984 Female	1984 Ratio of female to male (percentage)	1985 Male	1985 Female	1985 Ratio of female to male (percentage)
Africa											
Kenya	Shilling	EG/m	1 279.3	810.6	63.4	1 879.3	1 437.7	76.5	..	..	..
United Republic of Tanzania	Shilling	EG/m	683	693	101.5	..	..	..	..	..	..
America											
El Salvador	Colón	EG/h	2.61	2.12	81.2	3.31	2.77	83.7	3.56	2.90	81.5
Asia											
Hong Kong	Dollar	RT/d	85.70 b/	66.60 b/	77.7	104.20	84.40	81.0	115.10	91.20	79.2
Japan	Yen	EG/m	295 786	128 995	43.6	365 561	152 519	41.7	367 182	154 571	42.1
Korea, Republic of	Won	EG/m	196 231	88 456	45.1	317 273	149 718	47.2	346 852	162 705	46.9
Singapore	Dollar	EG/h	2.70	1.66	61.5	4.11	2.66	64.7	4.32	2.74	63.4
Sri Lanka	Rupee	EG/d	29.62	22.34	75.4	39.91	26.84	67.3	50.10	35.23	70.3
Europe											
Belgium	Franc	EG/h	236.18	164.61	69.7	299.66	223.25	74.5	312.53	232.25	74.3
France	Franc	EG/h	24.40	18.78	77.0	38.11	29.86	78.4	40.20	31.78	79.1
Germany, Federal Republic of	Deutsche Mark	EG/h	14.09	10.25	72.7	16.50	12.00	72.7	17.24	12.54	72.7
United Kingdom	Pound	EG/h	2.66	1.83	68.8	3.68	2.53	68.8	3.97	2.71	68.2
Oceania											
Australia	Dollar	EG/h	6.37	5.01	78.6	9.31	7.41	79.6	9.89	7.85	79.4
New Zealand	Dollar	EG/h	5.69	4.06	71.4	8.56	6.11	71.4	9.35	6.59	70.5

Source: International Labour Organisation, Yearbook of Labour Statistics, 1986 (Geneva, 1986), table 17.

a/ EG = earnings, RT = rate, /m = per month, /d = per day.

b/ 1982 figure.

Table 5 shows that, between the early and mid-1980s, the percentage of women in administrative and managerial jobs increased in all countries. Although this is a positive gain, the percentage of women in these jobs is low and sometimes insignificant. This is because almost everywhere women are employed at the bottom rung of the career ladder, working as direct operatives for low pay.

Table 5. Women in administrative and managerial jobs in selected countries, various years

Region and country or area	Year	Administrators and managerial workers		
		Total (thousands)	Women (thousands)	Percentage of women
Africa				
Egypt	1980	135.8	16.8	12.4
	1983	235.8	38.0	16.1
America				
Barbados	1981	3.1	0.8	25.8
	1985	3.8	1.1	28.9
Canada	1981	892	244	27.4
	1985	1 293	417	32.3
Chile	1980	67.6	10.5	15.5
	1984	105.6	18.8	17.8
Panama	1979	23.0	4.3	18.7
	1985	27.3	6.0	22.0
Puerto Rico	1981	84	16	19.0
	1985	86	19	22.1
United States	1980	11 138	2 920	26.2
	1984	11 571	3 889	33.6
Venezuela	1981	198.66	19.69	9.9
	1985	208.93	28.25	13.5
Asia				
Bahrain	1981	2.2	0.1	4.5
	1982	5.2	0.3	5.8

continued

Table 5 (continued)

Region and country or area	Year	Administrators and managerial workers		
		Total (thousands)	Women (thousands)	Percentage of women
Hong Kong	1981	81.6	8.9	10.9
	1985	86.5	10.8	12.5
Indonesia	1978	47	1	2.1
	1982	39	4	10.3
Israel	1981	46.5	4.2	9.0
	1985	73.1	9.2	12.6
Japan	1981	2 280	120	5.3
	1985	2 110	140	6.6
Korea, Republic of	1981	205	4	2.0
	1985	218	8	3.7
Kuwait	1981	3.231	0.065	2.0
Singapore	1981	58.3	8.6	14.8
	1985	65.9	13.1	19.9
Sri Lanka	1980	14.1	1.4	9.9
	1984	16.5	1.8	10.9
Thailand	1980	294.6	52.4	17.8
	1982	406.7	80.4	19.8
Europe				
Germany, Federal Republic of	1980	792	131	16.5
	1984	1 022	214	20.9
Greece	1981	73.7	7.6	10.3
	1984	50.8	7.1	14.0
Norway	1981	104	20	19.2
	1985	132	29	22.0
Portugal	1981	52	6	11.5
	1985	52	7	13.5
Spain	1981	173.4	4.7	2.7
	1985	177.5	6.1	3.4

continued

Table 5 (continued)

Region and country or area	Year	Administrators and managerial workers		
		Total (thousands)	Women (thousands)	Percentage of women
Sweden	1980	98	16	16.3
	1984	100	21	21.0
Oceania				
Australia	1981	399.8	57.9	14.5
	1985	450.5	79.6	17.7

Source: International Labour Organisation, Yearbook of Labour Statistics, 1986 (Geneva, 1986), table 3C.

The occupational distribution of women accounts in part for their much lower level of income in manufacturing and elsewhere (table 6). Table 6 shows the generally poor representation of women in administrative and managerial occupations. The position of women in non-manual occupations, excluding sales and service workers, has changed somewhat to reflect an overall advantage for women since 1980. Women still find jobs in clerical occupations; they are also visible in the category of professional and technical workers, where they generally provide low-paid yet vital services in the teaching and nursing professions. Table 6 does indicate that women are advancing in administrative and managerial jobs in most countries. However, the gap between the position of men and women is still wide and cannot be considered satisfactory.

In production work, women are recruited mainly for unskilled or semi-skilled jobs. Industries that employ women have acquired an image of being low-paying ones. The clothing industry is an example: in 23 countries surveyed by the International Labour Organisation (ILO), it was found to be one of the lowest paid sectors in manufacturing industry. Relatively low wages in any sector are invariably linked to a high proportion of female workers. 5/

3. Impact of export processing zones on the employment of women

One of the major driving forces behind the emergence of the modern manufacturing sector from the 1960s onwards has been the relocation of industries, especially those characterized by high labour requirements and low capital inputs, from the developed to the developing countries. This relocation has been possible because of spectacular changes in communications, transport and production technology. The introduction of computer and satellite technology has opened up new means of supervising production. New technology has made it possible to separate complex production processes into skilled operations and unskilled or semi-skilled ones. Thus, companies have been able to locate the research, development and initial capital-intensive stages of production

Table 6. Distribution of the male and female work-force a/ by occupation, in selected countries

Region and country or area	Year	Sex	Total employed (thousands)	Professional, technical and related workers	Administrative and managerial workers	Clerical and related workers	Sales workers	Service workers	Agricultural and related workers	Production and related workers	Workers not classifiable occupation
				(percentage)							
Africa											
Egypt	1980	M	9 106.3	7.8	1.3	6.5	6.9	8.9	44.3	24.3	—
	1983	M	9 581.4	9.2	2.1	7.2	6.2	8.8	40.1	26.3	—
	Change		5.2%	1.4	0.8	0.7	-0.7	-0.1	-4.2	2.0	--
	1980	F	692.8	40.6	2.4	28.2	4.5	7.9	8.8	7.5	--
	1983	F	1 944.6	19.7	2.0	14.9	7.7	4.1	40.8	10.8	—
	Change		180.6%	-21.0	-0.5	-13.3	3.2	-3.7	32.0	3.3	—
America											
Barbados	1981	M	57.4	11.0	4.0	8.4	6.4	11.8	10.5	47.9	—
	1985	M	52.0	8.7	5.2	11.5	7.3	15.8	7.1	44.4	—
	Change		-9.4%	-2.3	1.2	3.2	0.9	3.9	-3.3	-3.5	--
	1981	F	42.8	11.9	1.9	20.8	12.1	25.0	8.2	20.1	—
	1985	F	40.1	11.2	2.7	25.2	11.2	27.2	6.5	16.0	—
	Change		-6.3%	-0.7	0.9	4.4	-0.9	2.2	-1.7	-4.1	—
Canada	1981	M	6.559	13.1	9.9	6.4	10.4	10.1	7.2	42.8	—
	1985	M	6 507	13.6	13.5	6.0	9.2	10.5	8.1	39.2	—
	Change		-0.8%	0.5	3.6	-0.4	-1.2	0.4	0.8	-3.6	—
	1981	F	4 447	19.2	5.5	34.3	10.1	18.3	2.8	9.8	—
	1985	F	4 804	20.6	8.7	31.7	9.6	18.3	2.7	8.5	—
	Change		8.0%	1.4	3.2	-2.6	-0.5	-0.1	-0.1	-1.4	—

continued

Table 6 (continued)

Region and country or area	Year	Sex	Total employed (thousands)	Professional, technical and related workers	Administrative and managerial workers	Clerical and related workers	Sales workers	Service workers	Agricultural and related workers	Production and related workers	Workers not classifiable occupation
				(percentage)							
Chile	1980	M	2 297.9	4.7	2.5	11.2	11.5	5.1	22.4	40.8	1.8
	1984	M	2 343.4	4.6	3.7	9.5	11.4	5.0	21.8	42.4	1.6
	Change		2.0%	-0.1	1.2	-1.7	-0.1	0.0	-0.6	1.6	-0.2
	1980	F	959.3	13.2	1.1	18.8	17.2	30.3	2.8	16.3	0.2
	1984	F	1 005.9	13.1	1.9	16.5	16.3	30.2	2.9	19.0	0.1
	Change		4.9%	-0.1	0.8	-2.4	-0.9	-0.2	0.1	2.7	-0.1
Panama	1982	M	399.1	7.4	4.8	4.6	6.4	10.2	35.1	31.1	0.3
	1985	M	444.4	7.0	4.8	4.7	6.5	9.2	37.6	30.1	0.0
	Change		11.4%	-0.4	0.0	0.1	0.1	-1.0	2.6	-1.1	-0.2
	1982	F	162.0	18.3	3.1	25.7	9.3	30.2	3.9	9.5	0.1
	1985	F	185.2	20.5	3.2	23.5	10.8	30.1	2.7	9.1	0.0
	Change		14.3%	2.2	0.2	-2.2	1.5	-0.1	-1.2	-0.4	-0.1
United States	1981	M	57 397	15.9	14.6	6.3	6.1	8.9	3.9	44.3	—
	1985	M	59 891	14.4	13.1	5.7	11.0	9.5	4.9	41.3	—
	Change		4.3%	-1.4	-1.4	-0.6	4.9	0.6	0.9	-3.0	—
	1981	F	43 000	17.0	7.4	34.7	6.8	19.4	1.1	13.6	--
	1985	F	45 915	17.4	8.5	29.1	13.1	18.7	1.2	12.0	—
	Change		6.8%	0.3	1.1	-5.6	6.4	-0.7	0.1	-1.6	—
Venezuela	1981	M	3 465.79	6.1	5.2	7.3	12.5	8.1	19.4	40.8	0.6
	1985	M	3 626.05	6.6	5.0	5.8	13.5	8.8	21.4	38.2	0.6
	Change		4.6%	0.5	-0.2	-1.5	1.0	0.7	2.1	-2.6	0.0
	1981	F	1 288.82	19.8	1.5	23.0	13.7	28.0	1.7	12.2	0.1
	1985	F	1 384.98	21.6	2.0	20.8	14.2	28.3	1.7	11.2	0.1
	Change		7.4%	1.8	0.5	-2.2	0.5	0.3	0.0	-1.0	0.0

continued

Table 6 (continued)

Region and country or area	Year	Sex	Total employed (thousands)	Professional, technical and related workers	Administrative and managerial workers	Clerical and related workers	Sales workers	Service workers	Agricultural and related workers	Production and related workers	Workers not classifiable occupation
				(percentage)							
Asia											
Bahrain	1981	M	124.2	9.1	1.7	10.8	7.8	18.0	4.0	48.1	0.5
	1982	M	125.8	8.9	3.9	9.8	6.6	18.4	3.5	47.2	1.5
	Change		1.6%	-0.2	2.2	-1.0	-1.2	0.4	-0.5	-0.9	1.0
	1981	F	14.8	33.8	0.7	30.4	1.4	31.1	0.0	2.0	0.0
	1982	F	15.3	30.7	2.0	31.4	0.7	32.7	0.0	2.0	1.3
	Change		3.4%	-3.1	1.3	1.0	-0.7	1.6	0.0	-0.1	1.3
Indonesia	1978	M	32 905	2.0	0.1	4.4	11.3	4.6	62.7	14.9	0.0
	1982	M	37 065	2.8	0.1	4.7	11.3	3.2	55.2	22.2	0.6
	Change		12.6%	0.8	-	0.3	0.0	-1.4	-7.5	7.3	0.5
	1978	F	18 875	2.1	-	0.9	21.3	6.1	57.8	11.8	—
	1982	F	20 738	3.2	-	1.5	19.9	5.5	53.7	16.2	—
	Change		9.9%	1.1	-	0.6	-1.4	-0.6	-4.1	4.4	—
Japan	1981	M	34 190	7.1	6.3	12.7	14.6	6.3	8.4	44.3	0.2
	1985	M	35 030	8.4	5.6	12.9	15.3	6.5	7.5	43.4	0.5
	Change		2.5%	1.3	-0.7	0.2	0.7	0.2	-0.9	-0.9	0.3
	1981	F	21 620	9.7	0.6	23.6	14.4	11.8	12.3	27.4	0.2
	1985	F	23 040	10.6	0.6	24.7	14.1	11.8	10.5	27.3	0.3
	Change		6.6%	1.0	0.1	1.1	-0.4	0.0	-1.8	0.0	0.1

continued

Table 6 (continued)

Region and country or area	Year	Sex	Total employed (thousands)	Professional, technical and related workers	Administrative and managerial workers	Clerical and related workers	Sales workers	Service workers	Agricultural and related workers	Production and related workers	Workers not classifiable occupation
				(percentage)							
Korea, Republic of	1981	M	8 687	4.6	2.3	9.6	13.1	5.9	30.9	33.5	-
	1985	M	9 107	6.2	2.3	12.4	13.6	6.9	22.7	36.0	-
	Change		4.8%	1.5	0.0	2.8	0.4	1.1	-8.2	2.5	-
	1981	F	5 361	3.4	0.1	7.9	16.9	13.0	39.1	19.8	-
	1985	F	5 828	5.3	0.1	10.2	18.3	17.0	27.6	21.4	-
	Change		8.7%	1.9	0.1	2.3	1.4	4.1	-11.5	1.7	-
Kuwait	1981	M	147.294	10.6	2.1	10.6	5.5	9.2	1.4	60.6	-
	1981	F	7.841	39.0	--	--	--	--	-	--	-
Singapore	1981	M	717.8	8.7	6.9	9.1	13.6	9.5	1.7	42.8	7.7
	1985	M	734.3	10.1	7.2	8.0	15.0	8.3	1.3	42.7	7.4
	Change		2.3%	1.4	0.3	-1.0	1.5	-1.2	-0.4	-0.2	-0.3
	1981	F	395.0	9.8	2.2	27.6	11.3	13.7	1.1	34.0	0.3
	1985	F	420.0	11.0	3.1	29.9	13.2	16.7	0.7	25.2	0.1
	Change		6.3%	1.3	0.9	2.3	1.9	3.0	-0.4	-8.8	-0.2
Sri Lanka	1980	M	715.3	3.6	1.8	10.3	4.4	-	-	-	80.0
	1984	M	612.9	4.7	2.4	12.1	3.3	-	-	-	77.5
	Change		-14.3%	1.2	0.6	1.8	-1.1	-	-	-	-2.5
	1980	F	363.1	1.5	0.4	6.0	2.3	-	-	-	89.8
	1984	F	343.7	1.5	0.5	8.7	2.1	-	-	-	87.2
	Change		-5.3%	0.0	0.1	2.7	-0.2	-	-	-	-2.6

continued

Table 6 (continued)

Region and country or area	Year	Sex	Total employed (thousands)	Professional, technical and related workers	Administrative and managerial workers	Clerical and related workers	Sales workers	Service workers	Agricultural and related workers	Production and related workers	Workers not classifiable occupation
				(percentage)							
Europe											
Denmark	1981	M	1 059.5	14.4	6.7	9.9	6.6	6.6	4.0	51.5	0.5
	1985	M	1 383.6	16.5	5.3	11.9	6.5	5.7	8.9	44.6	0.5
	Change		30.7%	2.1	-1.3	2.0	-0.1	-0.9	5.0	-6.9	0.0
	1981	F	962.9	28.2	1.2	25.2	8.1	25.0	0.8	11.2	0.2
	1985	F	1 141.8	29.6	1.1	24.2	7.8	19.7	0.9	16.5	0.4
	Change		18.6%	1.3	-0.1	-1.0	-0.4	-5.4	0.1	5.3	0.1
Germany, Federal Republic of	1980	M	16 782	13.6	3.9	13.4	6.1	7.8	4.5	49.3	1.3
	1984	M	16 436	14.4	4.9	12.1	6.6	8.4	4.6	47.6	1.4
	Change		-2.1%	0.7	1.0	-1.3	0.5	0.5	0.1	-1.6	0.2
	1980	F	10 092	14.1	1.3	30.7	12.9	16.3	6.9	15.9	1.9
	1984	F	10 171	16.1	2.1	29.5	13.5	17.1	6.7	13.1	1.9
	Change		0.8%	2.0	0.8	-1.3	0.6	0.8	-0.2	-2.8	0.0
Oceania											
Australia	1981	M	4 057.9	12.9	8.4	8.0	6.8	5.5	8.6	49.9	-
	1985	M	4 089.0	14.1	9.1	7.9	7.0	5.6	8.5	41.5	-
	Change		0.8%	1.2	0.6	-0.1	0.2	0.1	0.0	-8.4	-
	1981	F	2 335.8	18.2	2.5	33.7	12.4	16.1	4.6	12.6	-
	1985	F	2 557.1	18.6	3.1	34.7	12.5	16.3	4.2	10.6	-
	Change		9.5%	0.4	0.6	1.1	0.2	0.2	-0.4	-2.0	-

Source: International Labour Organisation, Yearbook of Labour Statistics, 1986 (Geneva, 1986), table 3C.

a/ Work-force relates to the economically active population and comprises all persons of either sex who furnish the supply of labour for the production of economic goods and services as defined by the United Nations system of national accounts and balance, during a specific time period.

b/ Proportion of males or females in each occupational group as a percentage of the total number of males or females employed.

primarily in developed countries, while using the labour of women in the developing world for labour-intensive, routine, intermediary operations. This has occured particularly in the clothing, textiles and electronics industries. In 1980, nearly 3 million young women, partly from the developing countries, were producing clothing, textiles and electronic components for the world market. 6/

Governments and international development agencies have encouraged this pattern of development. Newly created industrial capacities have been built up as part of an international production and distribution network. Specially designed export processing zones have been set up in developing countries to attract foreign investment. In these zones, female employment has been outstandingly high, ranging between 75 and 90 per cent. Thus, the emergence of export-oriented manufacturing has contributed significantly to providing non-traditional jobs for women.

The number of export processing zones has increased considerably in recent years. There are between 80 and 180 export processing zones (depending on the definition used) throughout the world, and at least 40 developing countries operate such zones. The role of these zones in promoting industrialization has been a subject of heated controversy among development economists. The zones have been seen as a panacea for export-oriented growth by some and as an instrument of capitalist exploitation by others. As always, the truth is much more complicated than such extreme assessments.

Experience in many countries, in particular in east and south-east Asia, has shown that these zones can contribute substantially to generating and promoting manufactured exports and to providing employment opportunities for young women who otherwise would never have been able to enter the formal manufacturing sector. None the less, the high costs of providing these employment opportunities, especially in terms of investment infrastructure, have also been criticized. It has often been pointed out that export processing zones in general have been characterized by concentration on only a few industrial branches, by the use of simple and fragmented technologies, and by a lack of backward linkages with the domestic economy. The quality of employment, however, has been the target of the most severe criticisms.

Much of the employment has proven to be transitory, ill-paid and at the lower end of the occupational spectrum. According to a report of the Organisation for Economic Co-operation and Development (OECD) in 1984, for example, apprentices accounted for 30-40 per cent of the labour force employed in the clothing and electronics industries in export processing zones. 7/ While not officially documented in national or international data sets, a majority of these apprentices are thought to be young girls who are often hired under government-subsidized on-the-job training arrangements at lower wages because of their apprenticeship classification; when their wages should rise at the end of the "sheltered" employment period, these young women often lose their jobs.

In some cases, employment conditions in export processing zones have improved because transnational corporations from industrialized countries operating in them have been under pressure to extend the employment standards of their home countries to the processing zones. However, the opposite can

happen when the working standards and practices in the home country are lower and less regulated.

Health hazards are high for women employed in export processing zones. Byssinosis or "brown lung" is a common occurrence among female workers in the clothing industry. Electronic workers on the assembly line sometimes develop eye problems after only one year of employment. Moreover, in spite of its clean and clinical image, electronic assembly work exposes workers to dangerous chemicals. 8/

Critics of export-led growth, in which export processing zones play an important role, have made one point clear, namely, that women's industrial participation neither can nor should be defined exclusively in quantitative terms. Rather, the quality of industrial employment, as indicated by the skill content of jobs, should be the essential criterion. This is particularly important because the future of low-skilled, repetitive jobs in industries that have been relocated in developing countries looks uncertain in view of recent industrial restructuring which is a result of changing management strategies and new technologies in the developed countries. In the coming years, the quality of skills and training will determine the quantity of jobs created in the export processing zones of the developing countries. The magnitude and patterns of multinational investments in the last decade already show some reversal of past trends, 9/ as follows:

(a) There has been a substantial decrease of foreign direct investment from countries with developed market economies into developing countries, from a peak level of 42 per cent in 1975 to 17 per cent in 1986. This downward trend is continuing;

(b) There has been a dramatic expansion of foreign direct investment in services such as banking, finance and recreational facilities and in the service content of manufacturing, at the expense of investment in assembling operations;

(c) There has been a strong shift in the geographical distribution of foreign direct investment in developing countries, with increased concentration on east and south-east Asia, which can provide trained personnel.

It is becoming clear that the inter-country differences in labour costs have become less important as an investment incentive for multinational companies. The overall industrial environment of a host country is assuming much greater significance. In a recent survey of Japanese enterprises investing abroad, the technology support of a host country, encompassing the level of skill of the labour force, the infrastructure provided and the availability of necessary support industries, was found to be the most significant determinant of investment decisions, even more important than such weighty factors as exchange rates and political stability. 10/ As the significance of labour-intensive production processes declines, even in the textile and electronics industries, the major ways in which a country can attract technologically more advanced lines of production are by upgrading a zone's infrastructural facilities and by ensuring a steady supply of service and technology-related skills.

In order to allow women to retain their numerical dominance in export processing zones, therefore, concerted efforts have to be made to improve their access not only to high-level grade training in manufacturing technology, but also to new skills in service-oriented industries. The current state of employment in export processing zones shows that whenever there is a more diversified industrial structure, as in Brazil, the Dominican Republic, Mexico or the Republic of Korea, the representation of women in the total work-force becomes lower, declines to approximately 65 per cent. In contrast, countries where electronics and textiles account for 80 per cent of total employment in export processing zones, for example, China, Malaysia, Mauritius or Sri Lanka, the proportion of women in the total work-force exceeds 85 per cent. Hence, there is a fear that, as production in export processing zones is upgraded and diversified, the proportion of women workers will decline. It is therefore important to adopt well-defined and explicit training policies to counter this emerging trend.

4. Participation of women in the formal and informal sectors

An assessment of the current and potential participation of women in the labour force is generally made on the basis of published statistics. These statistics tend to reflect employment in large-scale factories, and work in small, less formally organized and often unregistered units is usually not recorded. This may lead to an overestimate or an underestimate of trends in female employment. For example, when factories are set up to manufacture products formerly produced in the informal sector, women may move from the informal sector to "new" jobs in the formal sector. If the informal sector was not included in employment statistics, the resulting increase in the number of women employed will not be a true picture but an overestimate.

In contrast, statistical bias can also lead to an underestimate of total net job creation for women. For example, in some industries the production line does not have to be physically integrated into the factory, for example when the equipment needed is not too large, there is no need for constant technical monitoring or quality control standards do not have to be too exacting. Work may be sent out to women working in their homes on a piece-work basis (so-called "manufacturing out work"). These women do the work of factory employees but are not included in employment statistics.

The textile industry is one of several industries where this situation applies. Women make up the bulk of these home-based workers, mainly because domestic piece-work is a way of combining unpaid household work and child care with wage labour.

There are indications that manufacturing outwork is increasing in both developed and developing countries. In Latin America, the informal sector, including domestic outwork, has always been large and its importance is increasing. 11/ A similar situation has been seen in some parts of Africa. 12/

Informal sector production is not confined to goods for domestic use. Rather, it covers a wide range of products for both national and international markets, and this range may increase with the introduction of new technology. For example, micro-electronic technology is making it possible to produce many sophisticated products in smaller factories or even in home-based units.

In the industrialized countries, new technology has revolutionized the way production is planned and executed and has given rise to widespread subcontracting to smaller units of production. The organizational patterns and production processes in enterprises producing car components and in the printing and textiles industries are examples. 13/ In these sectors, companies prefer to decentralize work as much as possible, while keeping tight control over the market, quality and image of the product. In management jargon, these companies have become "hollow corporations". Subcontracting to smaller production units, in many cases unregistered units, is also taking place in parts of the developing world, particularly in the clothing and textile industries of the least developed countries. 14/

Large companies see many advantages in subcontracting. These include increased flexibility in meeting fluctuations in market demand; reduced overhead costs; lower wage rates; and less organized labour intervention. In India, there has been an increasing tendency since 1970 for smaller units to become ancillaries of large units. The trend is particularly visible in light producer and consumer goods manufacturing, a sector that provides much of the industrial employment for women. While large and small units previously shared common markets on the basis of the sector's horizontal division, they now share a common production process because different stages of production are specialized. This might be called a vertical disintegration of the production process.

Strengths, weaknesses, opportunities and threats analysis is needed to determine whether small, in this context, indicates increased quality of employment for women workers. Women receive little protection and few benefits as wage-earners, either as outworkers or as employees of small units. The growth of the informal sector, however, opens up a new channel of employment; women may take on jobs that were previously monopolized by men in factories in the formal sector. Factories that are governed by labour and employment laws are often less willing to employ women than men because women are perceived as being more expensive, for example when legislation puts the cost of such measures as maternity leave, nursing breaks or créches directly onto the employer. In smaller units, however, employers often prefer to hire women, who are seen as being less militant and more manageable.

5. Part-time and flexible work

The rise of female employment in the informal sector in developing countries is mirrored in the growth of part-time work, shift work and contract jobs in the developed world. The increase in part-time jobs in developed countries is directly related to the flexibility of work contracts that employers are now successfully seeking. It is estimated that in the United Kingdom, nearly one in four workers work part time, and 90 per cent of these are women. This is typical of an overall trend in OECD countries. The rapid expansion of part-time employment in virtually all member countries over the past two decades is one of the most significant structural shifts in OECD labour markets. Over the last decade, full-time employment actually declined in a number of countries, but part-time employment expanded. 15/ A survey of the position of part-time workers in the European Economic Community (EEC) indicates that they do not enjoy the same privileges and protection as full-time workers and they have less chance of promotion and career development. In addition, part-time work is becoming associated with

temporary and casual employment. As a result, this form of employment, which in theory can offer working mothers some flexibility in their working hours, is being associated with low pay and insecurity. Sweden, however, provides a model of job-sharing and part-time work that combines flexibility with job security, with State-assisted social benefits and child-care provisions.

The growth of manufacturing outwork in the developed countries also warrants attention. In theory, home-based work, like part-time work, can offer working mothers flexibility in hours. This form of employment, however, can also lead to the creation of a vulnerable work-force that does not enjoy the protection of employment rights. The spread of such work, particularly among immigrant women in the Western world, has been documented extensively in the last five years. 16/

6. Self-employed women entrepreneurs

The growth of part-time work has not been perceptible in developing countries, where large companies seek employment flexibility by "hiring out" the work. This strategy creates a vulnerable, increasingly feminized work-force, yet it also offers women a new opportunity: rather than being wage-earners, they can become self-employed entrepreneurs.

Official international statistics do not reflect the true situation. Apart from the problem of collecting data, current definitions and classifications group employers and own-account workers together.* In table 7, this category is heterogeneous comprising, in the case of women, very few employers and a large number of own-account workers, their only common feature being that they are not employees. The figures reveal some definite patterns: in developed countries, the proportion of employers and own-account workers in the total employment generally is smaller than that in most developing countries. A comparison between table 7 (showing employment status for all economic sectors) and table 8 (showing employment status for manufacturing only), indicates that in most countries the overall percentage of employer and own-account worker is much lower in the manufacturing sector than in the economy as a whole: it is often easier and less expensive to set up on one's own in the services sector rather than in manufacturing. However, in a number of countries, the percentage of female employer and own-account workers is higher in the manufacturing sector which may be due to the large number of own-account workers. A large proportion of own-account workers are, in fact, contract workers, working either at home or in various workshops on a more or less casual basis. These workers do not enjoy any of the protection of labour legislation that applies to employees in the formal sector, and their earnings are much lower.

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*ILO defines an employer as "a person who operates his or her own economic enterprise or engages independently in a profession or trade, and hires one or more employees" and an own-account worker as "a person who operates his or her own economic enterprise or engages independently in a profession or trade, and hires no employees". Yearbook of Labour Statistics, 1986 (Geneva, 1986), p. 3.

Table 7. Distribution of the male and female work-force a/ by employment status in selected countries, various years

Region and country or area	Year	Sex	Total	Employer and own-account worker	Employee	Unpaid family helper	Other
				(Percentage b/)			
Africa							
Botswana	1981	M	189 070	3.2	47.4	41.1	8.3
		F	127 418	2.9	31.4	51.8	13.8
Egypt	1983	M	10 163 800	27.9	53.4	13.0	5.7
		F	2 174 900	17.0	42.3	30.0	10.6
America							
Bermuda	1980	M	17 232	11.2	85.7	0.1	3.0
		F	14 204	3.4	92.2	0.9	3.5
Canada	1984	M	7 169 000	10.3	88.7	0.4	0.6
		F	5 231 000	6.7	90.3	1.7	1.3
Costa Rica	1984	M	618 866	25.7	67.8	6.5	0.0
		F	175 560	9.1	88.9	2.0	0.0
United States	1985	M	65 967 000	10.0	89.1	0.2	0.7
		F	51 200 000	5.6	92.6	0.7	1.1
Asia							
Bangladesh	1983	M	25 958 000	40.3	41.7	16.1	2.0
		F	2 535 000	15.9	68.6	11.0	4.5
Hong Kong	1985	M	1 681 000	14.1	81.6	0.5	3.8
		F	956 100	2.7	89.6	4.4	3.3
Indonesia	1980	M	34 999 320	56.0	29.4	11.6	2.9
		F	17 110 606	44.9	22.2	28.7	4.2
Japan	1985	M	35 960 000	17.5	76.9	2.8	2.9
		F	23 670 000	12.2	65.4	1.9	2.9
Korea, Republic of	1985	M	9 585 000	35.7	55.1	4.2	5.0
		F	5 969 000	20.7	47.1	29.9	2.4

continued

Table 7 (continued)

Region and country or area	Year	Sex	Total	Employer and own-account worker	Employee	Unpaid family helper	Other
				(Percentage b/)			
Nepal	1981	M	4 479 944	84.1	11.8	1.7	2.4
		F	2 370 942	90.3	3.8	4.0	1.8
Singapore	1985	M	766 133	17.4	77.5	0.9	4.2
		F	437 904	5.4	87.0	3.5	4.1
Sri Lanka	1981	M	3 736 168	29.9	55.2	1.8	13.1
		F	1 280 345	9.6	55.3	3.1	32.0
Thailand	1982	M	13 500 000	39.7	28.3	29.4	2.7
		F	12 248 800	17.4	19.5	58.6	4.6
Europe							
Germany, Federal Republic of	1985	M	16 907 000	11.4	87.3	0.7	0.7
		F	10 775 000	4.8	87.0	7.0	1.3
Greece	1981	M	2 584 580	44.2	47.4	4.8	3.6
		F	959 215	13.0	52.6	28.2	6.3
Portugal	1981	M	2 656 129	21.0	72.9	1.6	4.5
		F	1 478 036	14.9	69.0	3.9	12.2
Oceania							
New Zealand	1981	M	876 609	16.0	79.5	0.2	4.3
		F	455 736	6.9	86.1	1.1	6.0

Source: International Labour Organisation, Yearbook of Labour Statistics, table 2B, various years.

a/ Work-force relates to the economically active population and comprises all persons of either sex who furnish the supply of labour for the production of economic goods and services as defined by the United Nations systems of national accounts and balance, during a specific time period.

b/ Proportion of males or females in each occupational group as a percentage of the total number of males or females employed.

Table 8. Distribution of the male and female manufacturing work-force a/ by employment status in selected countries, various years

Region and country or area	Year	Sex	Total	Employer and own-account worker	Employee	Unpaid family helper
				(Percentage b/)		
Africa						
Botswana	1981	M	3 473	3.4	96.6	-
		F	1 007	20.3	79.7	-
Egypt	1983	M	1 443 100	..	..	..
		F	254 300	..	..	..
America						
Bermuda	1980	M	611	12.9	85.6	--
		F	331	7.3	90.0	--
Canada	1984	M	1 576 000	1.5	98.5	--
		F	636 000	0.9	98.7	--
Costa Rica	1984	M	75 162	17.9	81.1	0.9
		F	30 884	12.9	86.5	0.6
United States	1985	M	15 106 000	1.7	98.2	0.0
		F	7 481 000	1.2	98.6	0.2
Asia						
Bangladesh	1983	M	1 785 000	21.5	69.6	8.9
		F	698 000	24.6	46.0	29.4
Hong Kong	1983	M	503 000	..	..	..
		F	430 000	..	..	..
Indonesia	1980	M	2 520 260	..	..	..
		F	1 840 397	..	..	..
Japan	1985	M	8 790 000	7.6	91.0	1.4
		F	5 740 000	15.3	75.8	8.9
Korea, Republic of	1985	M	2 147 000	14.6	84.4	1.0
		F	1 353 000	6.4	87.4	6.3
Nepal	1981	M	28 115	..	..	..
		F	2 867	..	..	..

continued

Table 8 (continued)

Region and country or area	Year	Sex	Total	Employer and own-account worker	Employee	Unpaid family helper
				(Percentage b/)		
Singapore	1985	M	163 501	8.6	91.1	0.2
		F	130 277	3.1	96.2	0.7
Sri Lanka	1981	M	313 885	17.8	81.6	0.6
		F	94 836	12.5	86.6	0.9
Thailand	1982	M	1 129 800	20.6	72.7	6.6
		F	876 700	22.8	58.1	19.1
Europe						
Germany, Federal Republic of	1985	M	5 938 000	5.1	94.8	0.1
		F	2 542 000	2.0	96.3	1.7
Greece	1981	M	484 082	31.6	65.6	1.7
		F	180 240	9.8	83.2	5.2
Portugal	1981	M	648 812	9.6	89.7	0.5
		F	359 815	6.0	93.3	0.5
Oceania						
New Zealand	1981	M	225 579	3.7	93.7	0.0
		F	85 551	2.9	93.3	0.2

Source: International Labour Organisation, Yearbook of Labour Statistics, table 2A, various years.

a/ Work-force relates to the economically active population and comprises all persons of either sex who furnish the supply of labour for the production of economic goods and services as defined by the United Nations systems of national accounts and balance, during a specific time period.

b/ Proportion of males or females in each occupational group as a percentage of the total number of males or females employed.

Yet the informal sector absorbs the majority of the work-force in many developing countries. In India, 89 per cent of working women are self-employed, and a sizeable proportion of them are engaged in manufacturing activities. 17/ The present economic crisis in the United Republic of Tanzania has led to a rise in the number of self-employed women entrepreneurs

there. 12/ The trend is visible in Latin America as well. The move towards self-employment, one of the consequences of the debt crisis, could become a catalyst for making women better established and more visible in the manufacturing sector. In the light of this development, programmes to assist self-employed women should receive greater attention. Programme designs should include a combination of training (including management, financial skills and assertiveness training) and improved access to raw materials, markets and technology. Such training can put women in a stronger bargaining position in the formal sector as well. It should be noted that many self-employed women are workers who could not find a job in the organized formal sector in the first place, either because of inadequate social and educational opportunities or because of gaps in their skills.

7. Demographic trends, unemployment and work experience

The need to explore the future potential for women workers in industry assumes added urgency in view of current demographic trends. In 1985, there were 542 million women workers in the developing regions (table 9), while in 1950, there were barely 263 million. According to ILO projections, there will be about 1 billion women workers by the year 2025. The present ecological, political and economic crisis will make it impossible for the agricultural sector of the developing world to absorb this swelling female work-force.

The problem of current and future rates of female unemployment assumes an added dimension when the age distribution of the unemployed in the developing countries is considered. In those countries where women and men enter the labour market at an early age, youth* unemployment becomes more acute than in other parts of the world. The preponderance of unemployed young women is especially acute in countries in Latin America and the Caribbean such as Barbados, Costa Rica and Jamaica (see table 10). This trend is all the more serious in the light of overall unemployment rates in the region occurring primarily as a result of the debt crisis. Overall unemployment rates in Barbados, Puerto Rico, and Trinidad and Tobago were over 15 per cent in the mid-1980s and the rates in Chile, Uruguay and Venezuela, were not much lower. 18/

In Africa, about a quarter of the labour force is unemployed in Botswana and Swaziland. The rate of unemployment is particularly high among young women under 20, for example, 44 per cent and 42 per cent in Botswana and Nigeria, respectively (see table 11). In Morocco, the unemployment rates are exceptionally high among young workers (36% for men and 34% for women).

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*For the purpose of this section, youth are classified as persons under 24 years of age.

Table 9. Female population, economically active population and crude activity rate, 1950 and 1985

	Female population a/ (millions)		Economically active female population a/ (millions)		Crude activity rate b/ (percentage)		Female share c/	
	1950	1985	1950	1985	1950	1985	1950	1985
World	1 260	2 403	412	790	32.7	32.9	34.6	36.5
Developing countries	805	1 756	263	542	32.7	30.9	33.6	34.7
Africa d/	106	263	34	71	32.2	27.0	36.4	35.7
Asia and Oceania e/	618	1 290	219	434	35.5	33.6	34.6	35.6
Latin America	82	202	10	37	12.6	18.5	17.9	26.6
Developed countries								
Centrally planned economies f/	157	218	71	100	45.2	46.1	47.7	47.1
Market economies g/	298	429	78	147	26.1	34.3	30.2	37.9

Source: International Labour Organisation, Economically Active Population Estimates and Projections, 1950-2025, vol. 5, 3rd ed. (Geneva, 1986).

a/ Absolute figures have been rounded to the nearest million without adjustment to group totals, which have been rounded independently. Therefore, the sum of the component parts may differ from the totals.

b/ Ratio of total female economically active to total female population. Calculation based on unrounded figures.

c/ Ratio of female economically active to total (both sexes) economically active population.

d/ Excluding South Africa, which is included in the figures for countries with developed market economies.

e/ Excluding Australia, Cyprus, Israel, Japan, New Zealand and Turkey, which are included in the figures for countries with developed market economies.

f/ Albania, Bulgaria, Czechoslovakia, German Democratic Republic, Hungary, Poland, Romania, Soviet Union and Yugoslavia.

g/ Northern America, northern Europe, southern Europe (excluding Albania and Yugoslavia), western Europe, and Australia, Cyprus, Israel, Japan, New Zealand and Turkey.

Table 10. Unemployed a/ by sex and age group in selected countries, 1981 and 1985
(Thousands)

Region and country or area	Sex	1981 Total	1981 Under 20	1981 20-24	1981 Over 24	1985 Total	1985 Under 20	1985 20-24	1985 Over 24
Africa									
Ghana	M	23.135	6.005	7.601	9.529	..	..	..	..
	F	8.595	2.966	3.164	2.455	..	..	..	..
Total		31.720	8.971	10.765	11.984	..	..	..	..
Mauritius	M	39.887	4.799 b/	23.096 c/	11.992	48.777	1.969 b/	25.517 c/	21.291
	F	16.634	0.897	7.618	8.119	16.037	0.358	6.476	9.203
Total		56.521	5.696	30.714	20.111	64.814	2.327	31.993	30.494
Seychelles d/	M	1.974	0.335	0.468	1.171	2.426	0.732	0.702	0.992
	F	2.025	0.363	0.591	1.071	3.287	1.397	0.652	1.238
Total		3.999	0.698	1.059	2.242	5.713	2.129	1.354	2.230
America									
Argentina	M	108.0	18.7	23.1	66.2	150.5	37.2	27.7	85.6
	F	66.8	17.0	14.8	34.9	81.1	24.6	11.6	44.9
Total		174.8	35.7	37.9	101.1	231.6	61.8	39.3	130.5
Barbados	M	4.6	1.8	1.3	1.5	8.6	2.3	2.6	3.7
	F	7.6	1.9	2.4	3.3	12.6	2.5	3.8	6.3
Total		12.2	3.7	3.7	4.8	21.2	4.8	6.4	10.0
Canada	M	494	113	120	261	750	109	166	475
	F	404	91	84	229	578	82	116	380
Total		898	204	204	490	1 328	191	282	855

continued

Table 10 (continued)

Region and country or area	Sex	1981 Total	1981 Under 20	1981 20-24	1981 Over 24	1985 Total	1985 Under 20	1985 20-24	1985 Over 24
Costa Rica	M	47.78	18.44	16.51	12.83	42.49	12.94	16.62	12.93
	F	21.83	8.37	8.70	4.76	18.27	5.55	9.47	3.25
Total		69.61	26.81	25.21	17.59	60.76	18.49	26.09	16.18
Chile e/	M	311.6	52.7	89.6	169.3	351.1	35.5	109.4	206.2
	F	105.4	15.9	43.4	46.1	190.1	19.0	73.0	98.1
Total		417.0	68.6	133.0	215.4	541.2	54.5	182.4	304.3
Jamaica	M	73.5	27.9	22.0	23.6	90.8	27.5	25.6	37.7
	F	180.5	46.0	52.9	81.6	178.0	42.2	56.7	79.1
Total		254.0	73.9	74.9	105.2	268.8	69.7	82.3	116.8
Panama f/	M	26.68	7.07	13.95	5.66	38.92	10.31	19.58	9.03
	F	24.82	5.53	13.79	5.50	29.87	6.68	15.86	7.33
Total		51.50	12.60	27.74	11.16	68.79	16.99	35.44	16.36
Puerto Rico	M	138	19	34	85	156	15	38	103
	F	46	6	13	27	55	5	16	34
Total		184	25	47	112	211	20	54	137
Trinidad and Tobago	M	25.5	8.8	7.8	8.9	46.4	11.8	14.9	19.7
	F	19.9	5.1	5.5	9.3	26.4	6.2	8.1	12.1
Total		45.4	13.9	13.3	18.2	72.8	18.0	23.0	31.8
United States	M	4 577	962	1 144	2 471	4 521	806	944	2 771
	F	3 696	800	833	2 063	3 791	661	794	2 336
Total		8 273	1 762	1 977	4 534	8 312	1 467	1 738	5 107
Uruguay f/	M	20.2	6.2	4.0	10.0	36.2	10.5	7.8	17.9
	F	22.2	4.6	4.9	12.7	47.5	9.5	11.7	26.3
Total		42.4	10.8	8.9	22.7	83.7	20.0	19.5	44.2

continued

Table 10 (continued)

Region and country or area	Sex	1981 Total	1981 Under 20	1981 20-24	1981 Over 24	1985 Total	1985 Under 20	1985 20-24	1985 Over 24
Venezuela f/	M	226.39	62.71	66.56	97.12	533.48	90.14	148.96	294.38
	F	62.66	16.34	23.65	22.67	152.09	24.60	52.60	74.89
Total		289.05	79.05	90.21	119.79	685.57	114.74	201.56	369.27
Asia									
Cyprus	M	3.601	0.272	0.704	2.625	4.614	0.160	0.786	3.668
	F	2.278	0.419	0.711	1.148	3.688	0.419	0.873	2.396
Total		5.879	0.691	1.415	3.773	8.302	0.579	1.659	6.064
Hong Kong	M	62.2	13.8	12.9	35.5	64.0	9.7	16.2	38.1
	F	31.5	9.2	8.0	14.3	31.1	11.3	10.5	9.3
Total		93.7	23.0	20.9	49.8	95.1	21.0	26.7	47.4
Korea, Republic of	M	526	73	126	327	478	39	115	324
	F	135	56	54	25	141	40	65	36
Total		661	129	180	352	619	79	180	360
Philippines	M	418	117	125	176	643	141	207	295
	F	591	136	181	274	672	129	216	327
Total		1 009	253	306	450	1 315	270	423	622
Singapore	M	20.32	3.07	6.95	10.30	31.88	2.05	9.32	20.51
	F	12.83	4.93	3.92	3.98	17.90	4.59	6.64	6.67
Total		33.15	8.00	10.87	14.28	49.78	6.64	15.96	27.18
Europe									
Germany, Federal Republic of	M	616.3	61.7	110.0	444.6	1 132.2	78.1	184.6	869.5
	F	640.1	73.7	129.6	436.8	1 018.7	96.3	204.6	717.8
Total		1 256.4	135.4	239.6	881.4	2 150.9	174.4	389.2	1 587.3

continued

Table 10 (continued)

Region and country or area	Sex	1981 Total	1981 Under 20	1981 20-24	1981 Over 24	1985 Total	1985 Under 20	1985 20-24	1985 Over 24
Italy	M	799	256	278	265	1 054	286	374	394
	F	1 096	323	312	461	1 418	363	455	600
Total		1 895	579	590	726	2 472	649	829	994
Sweden	M	55	10	11	34	65	5	16	44
	F	52	12	10	30	60	5	14	41
Total		107	22	21	64	125	10	30	85

Source: International Labour Organisation, Yearbook of Labour Statistics, 1986 (Geneva, 1986), table 9B.

a/ "Unemployed" comprise all persons above a specified age who during the reference period were: without work, currently available for work and seeking work. For a more detailed explanation, see the source, p. 515.

b/ 15-17 age group.

c/ 18-24 age group.

d/ Figures under the columns for 1981 are for 1983.

e/ Figures under the columns for 1985 are for 1984.

f/ Figures under the columns for 1981 are for 1982 and figures under the columns for 1985 are for 1984.

Unemployment rates are generally lower in Asia than in the other developing regions. As shown in table 12, countries with relatively low female unemployment rates are those that have successfully drawn a sizeable number of women workers into manufacturing production for export. Yet the future of such production is uncertain, and female unemployment rates are rising in the Philippines and Singapore. Current trends towards depressed commodity prices, falling remittances and increasing return migrations from the Middle East are also factors that will affect female and male unemployment in Asia.

A programme of sustainable development for the majority of the developing countries seems essential in this context. Development should be geared to using not only the material resources available to a country, but also its current and potential human resources.

Table 11. Rates of unemployment by sex and age group in Botswana, Malawi and Nigeria, latest year available
(Percentage)

Country	Age group			
	All	Under 20 years	20-24 years	Over 25 years
Botswana (1984)				
Total	25.3	32.8	37.8	20.7
Males	19.3	23.5	28.8	16.3
Females	30.6	44.1	44.1	24.6
Malawi (1983)				
All	5.4	9.8	7.8	3.3
Males	4.9	9.7	6.1	2.9
Females	5.9	9.8	9.2	3.7
Nigeria (1983)				
All	5.7	27.6	16.1	1.8
Males	5.1	22.2	15.2	1.6
Females	6.9	42.0	18.2	2.1

Source: International Labour Organisation, Bureau of Statistics reproduced from Women at Work, No. 2, 1987, p. 10.

C. Factors affecting women's participation in industry

1. Trends in industrial growth

The last three decades have seen an increase in women's share of industrial employment both in developed and developing regions. The

Table 12. Unemployment rates by sex and age group in selected Asian countries and areas, early and mid-1980s

Country or area	Early 1980s				Mid-1980s			
	Total	Under 20	20-24	Over 24	Total	Under 20	20-24	Over 24
Hong Kong	1982				1984			
Total	4.2	12.1	5.6	3.0	3.6	13.3	5.7	2.4
Males	4.3	13.3	6.0	3.2	3.8	11.8	6.4	2.8
Females	4.1	10.8	5.2	2.6	3.3	14.8	4.7	1.4
Indonesia	1982							
Total	3.0	8.5	8.4	1.0	..	..	..	..
Males	2.7	8.0	8.2	0.8	..	..	..	..
Females	3.6	9.1	8.8	1.3	..	..	..	..
Korea, Republic of	1982				1985			
Total	4.4	12.5	8.9	2.9	4.0	10.9	9.7	2.8
Males	5.5	14.5	11.9	4.1	5.0	12.2	13.8	3.9
Females	2.5	10.5	6.0	0.7	2.4	9.9	6.3	0.8
Philippines	1983				1984			
Total	4.1	7.2	9.8	2.5	6.1	9.7	14.5	3.9
Males	3.4	5.6	8.3	2.1	4.8	8.1	11.2	3.0
Females	5.3	9.6	12.2	3.1	8.2	12.2	19.9	5.4
Syrian Arab Republic	1983							
Total	5.1	12.0	7.7	3.0	..	..	..	..
Males	4.3	8.9	7.6	2.9	..	..	..	..
Females	10.6	24.7	8.2	3.9	..	..	..	..
Singapore	1982				1985			
Total	2.6	6.3	3.7	1.6	4.1	7.9	6.6	3.1
Males	2.4	5.3	4.1	1.7	4.2	4.9	7.2	3.4
Females	2.9	7.3	3.2	1.5	4.1	11.0	5.9	2.3
Thailand	1982				1984			
Total	3.6	4.3	5.2	2.9	2.3	2.6	4.9	1.5
Males	2.7	4.0	4.3	1.9	2.0	3.0	4.6	1.0
Females	4.6	4.6	6.1	4.1	2.6	2.2	5.3	2.1

Source: International Labour Organisation, Bureau of Statistics, reproduced from Women at Work, No. 2, 1987, p. 11.

continuation of this trend, however, will depend on the state of technology and developments in the world's industrial restructuring.

In the formal manufacturing sector, where large- and medium-scale firms predominate, women's prospects of employment are likely to continue to be in light industry (textiles, food processing or clothing) or in assembly-line jobs (semi-conductors or consumer electronic goods). However, the informal sector, always a "shock-absorber" during rapid structural adjustment, is likely to absorb the greater number of women seeking manufacturing work in all regions. Women's participation is likely to depend on whether the economy of the country in which they live has a strong or weak links to the world economy. In fact, only a limited number of developing countries have substantial linkages to the world economy through their manufacturing base; these are the ones in which technological innovations designed and implemented in developed countries are more likely to have immediate implications on trade relations and subsequently on female manufacturing employment.

2. Impact of technological changes on employment and skill requirements

A major trend in manufacturing employment in the world's developed countries is the declining importance of manual skills in the production process. The adoption of new production techniques as well as the development of new products, two major outcomes of the introduction of information technology, significantly alter the organization and nature of work in an enterprise. In general, these new techniques and products are predicted to have the following impact on manufacturing jobs:

(a) The proportion of managers, engineers and technicians is expected to increase;

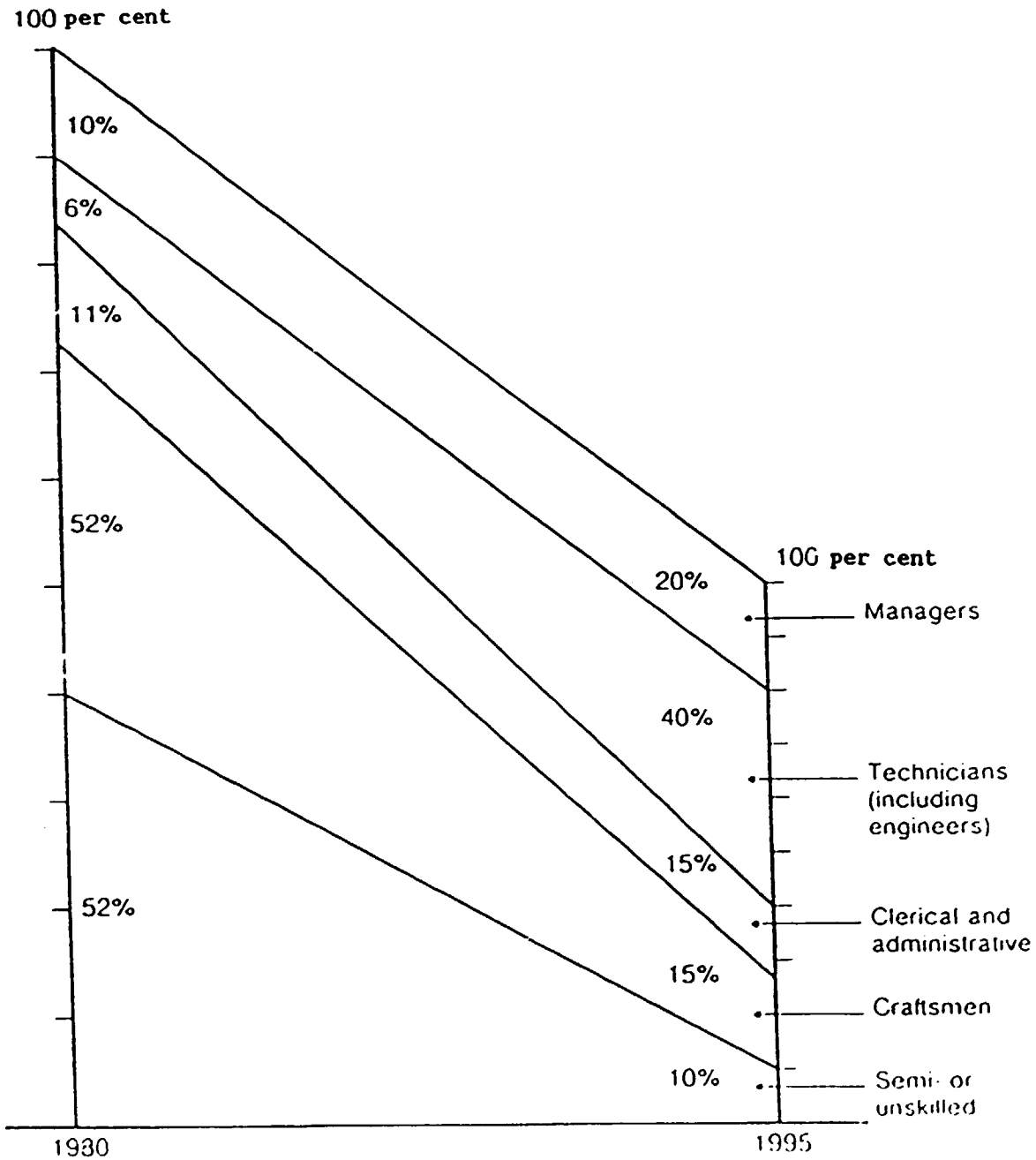
(b) The proportion of unskilled and semi-skilled workers and craftspeople is expected to decrease;

(c) These changes are likely to take place amid a general decline in manufacturing employment resulting from the labour-replacing effects of new technology.

Figure I shows, in schematic form, the future of these changes in the United Kingdom. Similar trends can be noted in some of the newly industrialized countries. In Hong Kong, for example, manufacturers of electronics equipment are now expanding their managerial and, in particular, technical and engineering staff; at the same time, they are reducing operative personnel, as they increasingly automate production and design their own products and manufacturing systems. 19/ In the Republic of Korea, technologists able to manage automated production systems will, by the beginning of the 1990s, dominate the work-force, at the expense of craftspeople and assembly-line workers. 20/

The advances engendered by new technology erode a comparative advantage that developing countries have long held in the international market, namely, a readily available source of cheap labour based on the female work-force. 21/ Consequently, the developing regions have to respond in new and different

Figure I. Projected changes in the volume and occupational structure of employment in the manufacturing industry in the United Kingdom, 1980 and 1995



Source: Commission of the European Communities (in association with the journal Futures, Eurofutures: The Challenges of Innovation, The FAST Report (London, Butterworths, 1984), p. 100.

ways. Among the measures that have been taken by various developing countries are the following: 22/

(a) An intensified shift to strategic up-market activities. The Republic of Korea has begun moving successfully from consumer electronics to sophisticated electronic components, Taiwan Province of China has become an important exporter of machine tools and several countries are developing activities in new fields such as biotechnology;

(b) More use of partnerships with developed countries. Joint ventures, licensing and technical assistance agreements are being used to integrate foreign technologies from multiple sources in order to create indigenous, up-market products;

(c) Investment in developed countries. Examples of this include investments from the Republic of Korea in the electronics sector in the United States, investments from Taiwan Province of China in the plastics industry in the United States and investments from Hong Kong in clothing manufacturing in Europe.

In the new technological environment that is evolving, the competitive advantage of a country on the manufacturing side of international trade depends very much on the speed at which innovations in production processes are adopted. The success of such adoption, however, hinges on the availability of trained personnel. This is because computer-based technology tends to come in an integrated package (hardware and software together) as part of a turnkey system from the developed countries. This situation has been favourable for certain industrializing countries because it is more profitable for multi-national companies to locate more varied and more complex manufacturing activities there. Foreign investments in these countries represent more than mere offshore transfer of assembly activities; they also make an enhanced contribution to the host country's development and to the upgrading of its export package. The production of computer peripherals in several of these countries and investments in the automobile industry to make engines, especially in Brazil and Mexico, exemplify investment carried out according to this more dynamic perspective.

The extent to which these countries can continue in this favourable direction depends largely on their capacity to utilize optimally the technological contributions of the more advanced regions and on the level of resources they are willing to channel into research and development (the levels are rising, especially in the Republic of Korea) and into educational and training improvements.

3. Human resource development as a determinant of economic competitiveness

In the emerging industrial global restructuring, the comparative advantages of national economies will no longer be determined by natural endowments of raw materials and labour but will be primarily based on technology and the skills of the labour force. Exploiting the potential contribution of the female work-force will provide a definite competitive edge, and education and training programmes for women workers therefore need careful planning. As manual skills and physical strength decline in

importance, a country can improve its competitiveness by enhancing and more fully utilizing the cognitive skills of its female work-force. Creating opportunities for women will be a prudent policy, not only on the grounds of equity, but also for economic growth. The increasing advances in and uses of information technology, a field in which there are acknowledged skill shortages, show the importance of training both male and female workers. In the Netherlands, for example, the Group for the Promotion of a Computer Science University estimates that the annual need for people with higher education in computer science is 2,900, while only 1,200 students graduate in this subject every year.* The increase in effective demand for computer and software services was, on average, 22 per cent in the European countries of OECD in 1984/85, a figure that far outpaces the growth in supply. The strategic importance of information technology is also evident in certain industrializing countries of the developing regions. This is demonstrated by the increasing number of joint ventures for software development, especially between Japanese firms and China and the Republic of Korea. Additionally, this technology opens up new export possibilities; software is being exported from Brazil and India. The Republic of Korea and Singapore are similarly encouraging the development and export of software by attracting foreign companies to use them as offshore development centres.

The steady supply of personnel trained in the use and management of information technology is a vital condition for strengthening the manufacturing and trading base of all developing countries and even more important for industrializing countries. 23/ This is important, both for attracting foreign companies and for expanding their domestic productive base. There are no ready-made formulas for training people to manage technological change. Many skills will have to be acquired on the job, as managers learn to work with the technology and the new type of workers in this field. To broaden the base of this management expertise, therefore, women must first be enabled to occupy a substantial number of managerial posts.

The need to receive broad training in mathematics and languages should be stressed as well. 24/ In order to create an environment that could develop the attributes of such personnel, close collaboration between industry and academic training centres will be necessary. In this context, it is important to increase women's representation in industries both as role models and as a new source of cognitive skills.

4. Education and training

(a) Training in the formal sector

The present pattern of education deserves close scrutiny in the light of the above argument. Even with an increase in literacy in most parts of the world, there are universal deficiencies in the number of males and females studying or employed in scientific and technological fields. Engineering

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*Cited in International Labour Organisation, "Training and retraining: implications of technological change", report III, Fourth European Regional Conference (Geneva, 1987), p. 18.

is the field in which women are the least represented, as can be seen in table 13. In some industrialized countries, such as the Federal Republic of Germany, Italy, Japan and Switzerland, the representation of women is particularly low. 25/ This finding reveals that the overall growth of a country alone does not diminish sex-stereotyping in vocational training and occupations. The overall tendency at the academic level, as table 13 shows, is that women are located in the humanities and social sciences and men in the natural sciences and technology. While this pattern of horizontal differentiation is subsequently reflected in the pattern of employment, there is also vertical differentiation, with women mainly at the lower levels of achievement and authority.

The mere introduction of practical technical training as an option in the educational system may not necessarily mean that more girls and women will choose technical subjects. Special encouragement and counselling to counter obsolete stereotypes are urgently needed. The low representation of women in technical and engineering training courses is also the result of women's reluctance to enter male occupations, which are often seen as demanding and incompatible with women's future role in the home and as mothers.

In many countries, government support will be needed to enhance women's industrial participation by ensuring that the training programmes in which women participate impart the skills needed in the labour market and that women have access to jobs upon completion of training.

(b) Training in the informal sector

While it is important to identify the gaps in skills that exist in a country and to orient women's training programmes towards them, in the majority of developing countries more women seek and find jobs in the unorganized or informal sector of the economy. The garment industry in Delhi (accounting for 60% of the country's annual garment export) is an example. According to the official estimate, the 373 production units employ 13,563 workers. The Garment Exports Association, in contrast, places the figure at 100,000 workers, of whom 25 per cent are women. Recent research reveals that even the latter figure is a gross underestimate, as it does not take into account the large number of home-based women workers in the garment industry. 26/

The informal sector is a major source of industrial employment for women in all developing countries, especially those in Africa and Latin America. This sector becomes even more important during times of economic downturn and restructuring, as has been characteristic of most developing countries throughout the 1980s.

A programme for human resource development that focuses on women in the informal sector must adopt different approaches and strategies than one directed towards the formal sector. Such a programme must be based on the following considerations:

(a) Women in the informal sector are not easily identified, and they are not recognized in official statistics. Usually, the first step to develop a programme, a needs assessment, is difficult to undertake. Women must be identified according to the type of work performed, place of residence, age,

Table 13. Enrolment of women in various fields of science by area
(Percentage)

Area	Educational science and teacher training	Social and behavioural sciences	Natural sciences	Mathematics and computer science	Medicine and health	Engineering	Agriculture	Total in scientific fields
Africa a/	30	25	20	20 b/	30	5	15	25
Latin America and the Caribbean c/	60	55	50	45 b/	50	10	20	45
Asia and Oceania d/	55	35	30 e/	30	40	10	20	25
Western Europe f/	65	40	35	30	50	5	25	40
Eastern Europe g/	70	60	50	45	70	25	35	45

Source: Figures compiled from national data contained in Shirley M. Malcom, "The participation of women in policy and decision-making regarding the use and development of technologies", Science and Technology and Women - Proceedings of the Joint Panel of Experts on Science Technology and Women (12-16 September 1983), Shirley M. Malcom, ed. (Washington, American Association for the Advancement of Science, 1984). Malcom has based her own figures on the UNESCO Yearbook 1982 (Paris, UNESCO, 1982).

a/ Algeria, Benin, Botswana, Burkina Faso, Burundi, Central African Republic, Congo, Egypt, Ethiopia, Gabon, Ghana, Côte d'Ivoire, Liberia, Mali, Mauritius, Morocco, Niger, Senegal, Sudan, Togo, Tunisia, Uganda and United Republic of Tanzania.

b/ Mathematics and computer sciences are separately listed only for about half of the countries involved.

c/ Argentina, Chile, Colombia, Ecuador, El Salvador, Guatemala, Guyana, Haiti, Honduras, Mexico, Panama, Paraguay and Uruguay.

d/ Afghanistan, Australia, Bangladesh, Burma, Hong Kong, India, Iran (Islamic Republic of), Iraq, Israel, Japan, Jordan, Kuwait, Lebanon, Malaysia, Nepal, New Zealand, Pacific Islands, Papua New Guinea, Philippines, Republic of Korea, Saudi Arabia, Thailand and Turkey.

e/ Notable single figures are 13.2 per cent for Japan and 64.6 per cent for the Philippines. This, however, raises questions of comparability of the data.

f/ Austria, Belgium, Denmark, Finland, Germany, Federal Republic of, Greece, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom of Great Britain and Northern Ireland.

g/ Albania, Bulgaria, Czechoslovakia, German Democratic Republic, Hungary, Poland, Union of Soviet Socialist Republics and Yugoslavia.

social status and similar characteristics. Special enumeration and evaluation techniques are needed. The large numbers of women that reportedly work in this sector, especially in urban settings, could make programme design and planning tasks difficult;

(b) Women may not consider themselves to be employed and may exhibit a lack of assertiveness. They may lack access to information on assistance or labour market developments. They may therefore have difficulty in articulating their needs or locating assistance, and they often work independently rather than in groups. Even with human resource approaches that include access to credit or marketing assistance, it may be difficult to reach the women who most need such services;

(c) Labour legislation, safety and health regulations and employment benefits do not normally apply to the informal sector. It is thus difficult to keep women from being exploited with regard to hours of work and remuneration. This should be considered when designing and planning programmes.

Informal sector programmes in different developing countries have had some success. The Self Employed Women's Association (SEWA) and the Working Women's Forum of India include the formation of co-operatives for buying and selling, credit access and training programmes. Export production villages in Sri Lanka focus on production and export of agricultural and small items such as hand looms, woodcrafts and electronic equipment. These and similar programmes need to be reviewed and examined to determine innovative practices and to identify areas in which similar programmes could be set up.

Many informal sector programmes have been directed towards income-generating activities; these have been oriented primarily towards lower level skill training to enable women to supplement family income. The concept of entrepreneurship in modern economic terms has not been a feature of these efforts. It has been observed, however, that many women, although motivated to enter the commercial world, cannot do so because of their relative isolation from technical and professional expertise. A small entrepreneur invariably needs to maintain efficiency as a worker and as a manager. Hence, a training programme for female entrepreneurship should include technical assistance, identification of new marketing outlets, participation in trade exhibitions and conferences, and access to credit and business information. The Indian Council of Women Entrepreneurs and the Women's Chamber of Industry and Commerce in Sri Lanka have made some efforts in this direction.

D. Textiles and electronics: two illustrative industries

Two industries feature prominently in any discussion on women and manufacturing employment: textiles and electronics. Despite their similarities, these industries have different images. The textiles and clothing industry is viewed as a "sunset" industry and the electronics as a "sunrise" one, particularly in industrialized countries. With rapid structural adjustments and the introduction of new technology, however, production processes and work organization are changing in both industries. These changes need to be identified in order to formulate women's training or human resource development programmes for the jobs of the future.

1. Factors affecting women in the textiles and clothing industry

The textiles and clothing industry has been an essential promoter of industrial development in developing countries. Export-led growth in several Asian countries during the last two decades has often been synonymous with textile-led growth. Yet recent trends in the international textiles and clothing industry indicate that in the future this industry's contribution to economic development may take a different shape.

Table 14 provides an overview of the changing shares of world exports among countries with developed market economies, countries with centrally planned economies and developing countries. The latter are divided into two subgroups according to the pace and timing of their entry into the world textile and clothing market. The first subgroup, defined as major textile exporters, includes the developing countries and areas that have reached a relatively advanced level of income per capita and that gained a major share in the textile and clothing import markets of the United States or the European Community during the 1970s and 1980s. These include Brazil, Hong Kong, Mexico, the Republic of Korea and Yugoslavia. All remaining developing countries have been included in the second subgroup, other developing countries. As table 14 shows, the share of the major textile exporters increased rapidly in the world export market until the mid 1970s. Between 1975 and 1980, however, they could only marginally improve their international market positions; this is because their exports met with both protectionist barriers in industrialized countries and growing low-cost competition from other developing countries. Between 1975 and 1985, the other developing countries almost tripled their share in the world export markets, from 7.8 per cent in 1975 to 20.9 per cent in 1985. Between 1980 and 1985, there were some market gains for major textile exporters, but the export growth rates of other developing countries, with an annual 11.7 per cent increase, far exceeded the 4.3 per cent growth rate achieved by the major textile exporters.

Table 14. Share of selected country groups in world trade of textiles and clothing, 1965-1985
(Percentage)

Economic grouping	1965	1970	1975	1980	1985
			Exports		
Developed market economy countries	82.0	80.3	72.0	66.0	55.8
Developing countries and areas:					
Major textile exporters	9.6	12.0	17.3	18.0	21.2
Other developing countries	6.8	5.7	7.8	13.4	20.9
Centrally planned economy countries	1.6	2.0	2.9	2.6	2.1

continued

Table 14 (continued)

Economic grouping	1965	1970	1975	1980	1985
			Imports		
Developed market economy countries	70.3	75.6	78.0	77.5	80.1
Developing countries and areas:					
Major textile exporters	5.0	7.5	5.3	6.0	8.2
Other developing countries	21.5	12.5	11.9	13.1	9.1
Centrally planned economy countries	3.2	4.3	4.7	3.4	2.6

Source: Data base of the United Nations Industrial Development Organization.

The future of export-led growth for developing countries, in spite of the recent record, seems less certain in the coming years, because of the following:

(a) A relatively smaller growth rate in the demand for textile products in almost all developed countries (resulting at least partially from lower population growth);

(b) An expected rise in trade barriers;

(c) The entry of countries with low labour costs (Greece, Portugal and probably Turkey) into the European Economic Community.

Hence, it appears that internal markets will have to assume greater importance as a source of growth for the textiles and clothing industry in developing countries in the coming years.

Until recently, the employment structure of the textiles and clothing industry was characterized as having a fairly large share of low-skilled workers. In 1985, in the Federal Republic of Germany, for example, almost 60 per cent of those employed in textiles were low-skilled or semi-skilled, and the share was even higher for clothing. 27/ In all countries, women provide the major work-force in assembly-line jobs of both subsectors; in export processing zones, women operatives may account for 90 per cent of the total work-force.

The importance of low-skilled or semi-skilled labour previously meant that it was cost-effective to produce the textile products, or at least parts of them, in countries with low labour costs. In the past three or four years, however, the textiles side of the industry has become highly capital-

intensive. Consequently, the share of capital in total costs has gained importance, especially in developing and industrializing countries. Cost studies by the International Textiles Manufacturing Federation for Brazil, India and the Republic of Korea show that in spinning and weaving the weight of capital costs is from three to six times that of labour costs; in the Federal Republic of Germany and the United States, by contrast, they have equal weight. 28/ The rising share of capital costs reduces the price competitiveness of the developing countries vis-à-vis the developed countries, and the more countries with low labour costs use the latest machinery, the greater their loss of comparative advantage based on cheap labour. On the positive side, modern technology allows low-wage countries to manufacture products of almost identical quality to those produced in the industrialized countries. The quality of products, however, depends just as much on the availability of skilled labour as on the introduction of technology.

(a) Technological innovations

Technological progress in the manufacturing of fabrics and yarns will alter significantly the quantitative as well as the qualitative demand for labour. It will lead, first of all, to the loss of manual jobs. In spinning, for example, the savings in labour with computer technology can be as high as 50 per cent. There will also be qualitative changes in skill requirements: the demand for unskilled labour will decline and the demand for highly skilled labour will rise. Both trends will reduce women's share in manufacturing employment, unless women are trained in the new skills as rigorously as men.

The impact of new technology will be felt particularly in three stages of production: operating machines; monitoring machines; and repairing and exchanging spare parts. Of these three, operating machines, which is traditionally carried out by female workers, will become simpler, with the result that a lower level of skill will be required. Monitoring and repairing machines, by contrast, will become more complex, and workers required to perform these tasks will require a higher level of skill. Moreover, jobs will increasingly contain elements that previously have been considered marginal, such as planning, preparing and organizing. In other words, there will be a demand for a functionally flexible work-force, with greater emphasis on job enrichment. 29/

To be part of this flexible work-force, women will require training that goes beyond the strict domain of technical knowledge. Training will be necessary in finance, accounting and marketing, and the ability to respond quickly to changes in demand will be considered an important skill. This is because it is possible, with the aid of computers, to set new patterns on machines in a fraction of the time it used to take. 30/

The introduction of computer technology has been more uneven in the clothing industry. By far the most striking innovations in that industry have occurred in the pre-assembly stages, where the greatest progress has been made in computer-aided design (CAD) and computer-aided manufacturing (CAM). Computer-aided systems save fabric and help to construct new patterns by special software. They also reduce a firm's reliance on the craft skills of male cutters and designers.

Important as it may be, the introduction of computer technology in the pre-assembly stages does not affect women's current jobs, which are solely concentrated in the machining stages. However, CAD/CAM potentially opens up a new area of employment for women by reducing the importance of craft and physical skills in designing and cutting.

In the assembly stages, where women workers currently predominate, two types of computerized sewing machine have been introduced, namely, dedicated and programmable machines. The former are designed to do a specific operation, for example buttonholing. The latter require an operator to programme the machine to carry out a job; once it is programmed, the machine can then repeat it.

So far, advances in assembly-line operations have not caused machinists to be replaced by machines, but machinists now need fewer skills. In a recent report, 31/ mention is made of a machine that can be programmed to bluff pockets to jackets, which is one of the critical skilled jobs left in clothing manufacture. Employers still need one operator for each sewing machine; however, the jobs have become extremely boring since the operator only needs to load and unload the garment on to the machine.

Thus, the new technology will not of itself bring a promise of rewarding or highly-paid jobs for women in the clothing industry. High technology, when introduced, has improved the performance of sewing machines, but the basic operation has remained unaltered for the past 150 years.

In Japan, the United States and western Europe, extensive research efforts are under way to automate various tasks and, eventually, to create an automated factory. However, the creation of a completely automated factory remains a dream of the future unlikely to become a reality before the year 2000.

(b) New skill requirements

In the short run, the upgrading of women's jobs in the clothing industry will require new opportunities for them in technical and managerial areas. Before these opportunities can be accurately identified, however, the impact of technology on management tasks and decision making will need to be assessed The following areas of management will need attention:

(a) Implementation of new technology in distribution and warehousing;

(b) Use of new technology in assessing the market;

(c) Subcontracting parts of production to outside firms;

(d) Recruiting appropriate personnel for new tasks.

Before steps are taken to develop the skills of women in developing countries, an assessment must be made of the desirability of adopting the current technical innovations in developing countries. Technological innovations of major machinery manufacturers have traditionally been linked to the needs of the market and the factor costs of industrialized countries. Innovations in textiles and clothing have not been focused on the specific

needs and relative factor endowments of developing countries, and not much research has been devoted to elaborating intermediate technologies that correspond to the specific needs of developing countries. In this context, the potential of the human-centred technology, which aims at enhancing worker skills rather than "deskilling" or reducing the work-force, that has been introduced in the clothing industry in the Federal Republic of Germany is worth consideration.*

(c) New work-place design

New technology changes not only skill requirements but also the design of the work-place. The use of computer-aided machines, in the absence of countermeasures, can lead to new types of stress at work, thus reducing the quality of women's current and future employment. In the textile industry, work is now often organized in such a way that one worker has to monitor a larger number of machines, giving the worker greater responsibility and more mental work. Without proper attention to the layout of work stations and other human factors, increased stress can result. In operating occupations, where women are usually employed, there is an increasing tendency for the work to be more repetitive. This often leads to repetitive strain injuries. The most common form of these injuries is tenosynivitis, a disorder that can result from inadequate training in machine use, excessively fast-paced production schedules, faulty equipment design, rapid and repetitive movements, awkward working postures or a blow to wrists or elbows.

Because of the large proportion of women operatives in the textiles and clothing industry, career development policies should strive to increase their numbers in other than operative functions. There is little evidence, however, that this is happening, except when women rise to the position of line supervisor. The emerging field of fashion and design management is still fairly free of gender stereotyping and hence opens up a new area for women. The creation of a national design and fashion centre, as an essential part of a country's restructuring programme, could facilitate women's prospects for managerial jobs in the industry.

2. Women in the electronics and electronics-related industries

(a) Structural changes

The electronics and electronics-related industries cover a wide range of products, but women find employment only in certain segments of this industry

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*H. J. Braczyk, Christa Gebbert and J. H. Knesebeck, Neue Transport-technologien in der Bekleidungsindustrie (VDI Verlag, 1986). Research on exploiting the potential of human-centred technology around sewing machines is being undertaken by H. J. Braczyk and Christa Gebbert in Arbeitsgruppe für sozialwissenschaftliche Industrieforschung (ASIF) GmbH, Bielefeld, Federal Republic of Germany. Some results have been documented in Christa Gebbert, "Application of technology and working conditions in the German clothing industry", paper presented at the workshop on Information Technology and the Clothing Industry, Brighton Polytechnic, 26-28 February 1988.

and in specific occupations. None the less, over the years, it has become one of the major new sources of employment for women workers in the manufacturing sector. Hence, an analysis of the impact of the current restructuring and technological innovation deserves special attention.

There are four major subsectors in the industry: semi-conductors; software; computer and telecommunication systems; and consumer electronics goods and other applications.

Women are employed primarily in the semi-conductor and consumer electronics goods subsectors, mostly in unskilled, assembly-line jobs. The knowledge-based and high-technology occupations in the electronics industry are still almost entirely occupied by males. Semi-conductors lie at the heart of the production of all electronics-related goods. There are three categories of semi-conducting devices: discrete components, such as transistors and diodes; integrated circuits; and special-purpose devices and circuits.

The production of semi-conductors is dominated by Japan and the United States, and both countries are net producers of semi-conductors. The United States produces nearly two thirds and consumes about one half of the world's production; Japan produces more than one quarter and consumes less than one quarter. Western Europe and the rest of the world are net consumers of semi-conductors: western Europe consumes about one fifth of the total production, but produces less than half of that amount; and the rest of the world consumes less than 10 per cent and produces about 2 per cent of the total world production. The production of semi-conductors in the export-processing zones of Asian countries or by the maquiladoras of Mexico is primarily in offshore facilities of foreign companies owned almost solely by firms from the United States. In fact, the United States imported $US 4 billion worth of semi-conductors in 1982, of which $US 3 billion was from four Asian countries: Malaysia, the Philippines, the Republic of Korea and Singapore. 32/

Although semi-conductors are critical components of electronics systems, they constitute a relatively small fraction of the total equipment and systems cost. Telecommunications equipment, for example, had sales in 1984 of about $US 59 billion, whereas the value of the semi-conductors used in this equipment is only about $US 4.5 billion. The total world market value of electronic equipment is currently more than $US 400 billion and is growing rapidly. The anticipated high growth rates in data processing, office equipment and software are particularly noteworthy. 32/

Despite this expanding market, only a handful of developing countries and areas have made an entry into the electronics equipment industries: Hong Kong, Singapore, Taiwan Province of China and the Republic of Korea together account for 80 per cent of all electronics equipment exports from the developing countries. 33/ Initially, indigenous firms, some of them subcontractors of European, Japanese and United States companies, entered the industry by producing simple consumer products such as radios, black-and-white television sets and audio equipment. The technology for these products was easily obtainable and was changing slowly, so that there were low technological barriers to entry. The firms competed on the basis of prices, taking advantage of their extremely low labour costs. Later, as the firms' technical

capabilities improved by learning the simple technologies, they developed the capability to imitate foreign technologies and to modify the technologies imported through licensing. They were then gradually able to move to more complex consumer products such as colour television sets and cassette players. The larger firms began to develop their own international marketing capabilities, which helped to overcome some of the major problems of peripheral location by feeding back information on market and technology development to the home country.

The industry has grown dramatically in several Asian countries; in the Republic of Korea, for example, employment grew from 30,000 in 1970 to 250,000 (representing 13 per cent of the manufacturing work-force) in 1983. In order to counteract the threats of competition from countries with less expensive female labour, such as the Philippines and Sri Lanka, some Asian countries have gradually moved to products that are at a more advanced stage of the industrial life-cycle. These are the products where the technological barriers to entry are especially high such as colour television sets, video cassette recorders, instruments, telecommunications and computer-related products.

In contrast, Latin American countries, such as Brazil, Mexico and Venezuela, have an indigenous electronics industry that is at a fairly early stage of development. Mexico has an electronics sector that is large but uncompetitive in the consumer-goods subsector. Recently, it has also taken positive steps to attract foreign investment in the non-consumer-goods electronics sector.

In south Asia, the electronic industries are based, for the most part, on simple consumer products such as radios, television sets and tape recorders, which are produced mainly to reduce import reliance. In recent years, a more diversified sector has grown in India involving computers, communication equipment, process control equipment and other instruments. Recently, India has also started production of small volumes of integrated circuits. In general, technology levels lag significantly behind the world state-of-the-art, and rates of indigenous innovation are low.

(b) Technological innovations

The majority of the female work-force in the electronics industry is in Asia. Total employment in Asia's electronics industry, including China and Japan, exceeded 1 million in 1983. 34/ In 1978, over 90 per cent of the total electronics work-force in Asia, not including Japan, were unskilled and semi-skilled production operatives, performing manual and semi-automated assembly line jobs and product testing. Over 90 per cent of these operatives were women. 34/ In 1983, however, there were indications that in some Asian countries the percentage of male operatives employed in electronics had increased, although only slightly. The average electronics worker in Asia, in the 1980s, is 20 years old, female and unmarried. The profile of the United States work-force in the industry has some similarities to that in south-east Asia. About 60 per cent of the United States electronics work-force in 1982 consisted of production and clerical workers. Nearly one quarter were semi-skilled operatives, of whom 69 per cent were women. Over half of the

operatives in the United States at the time were originally from Mexico, the Philippines and Indochina. Most of the engineers, programmers and managers were white males.

The continuing employment prospect for women in the industry depends on a number of factors. From a purely quantitative point of view, women's jobs depend on the demand for electronic goods and the consequent demand for semi-conductors. Apart from cyclical fluctuations, the demand for electronic goods and hence of semi-conductors is expected to rise for the coming years. Booming sales of computers, computer workstations and other electronic goods have already produced a world-wide shortage of computer memory chips. Between 1982 and 1988, as figure II shows, sales of semi-conductors have more than doubled; unless the supply can be increased, the chip shortage will dampen the growth of the entire electronics industry. 35/

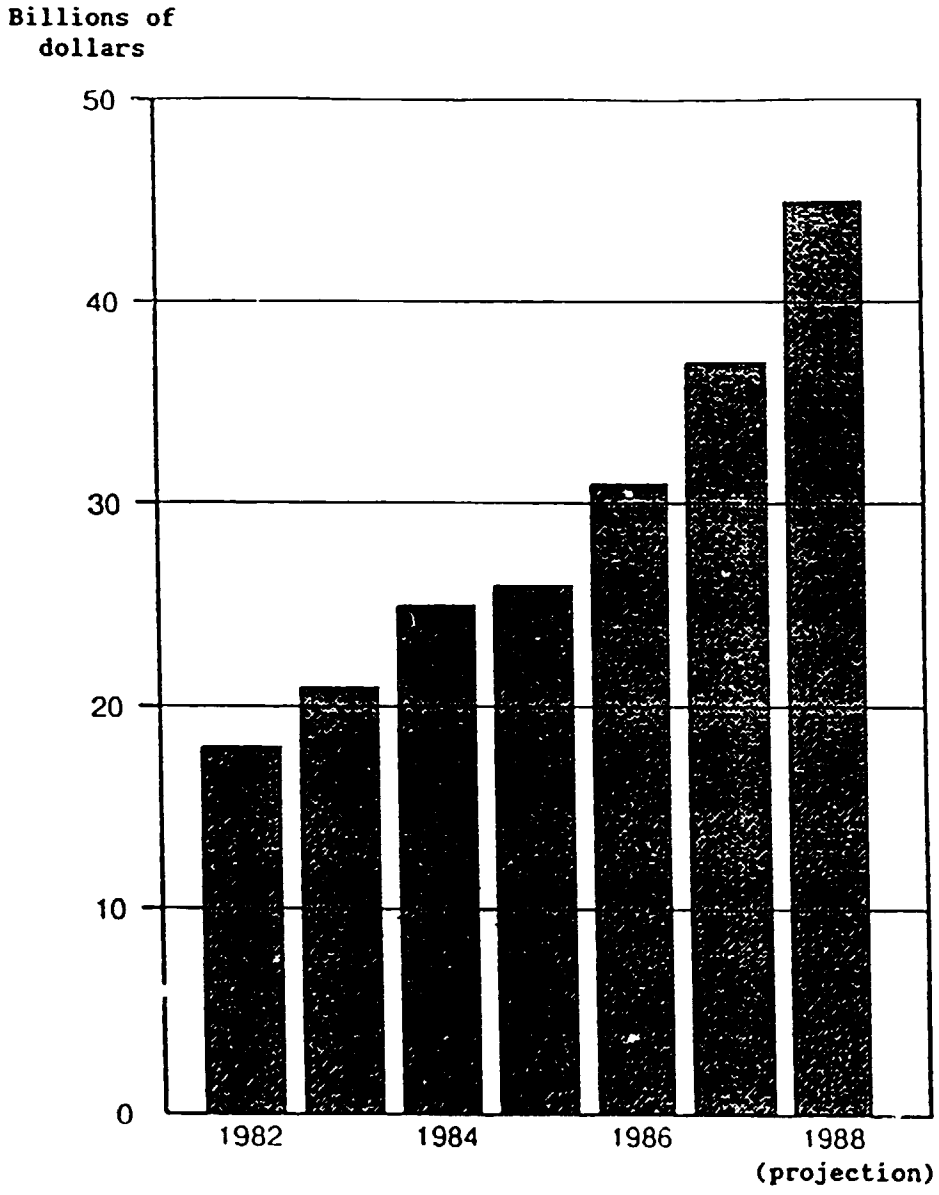
The steady increase in the demand for microchips, however, does not necessarily assure women's share of employment in the industry, particularly in developing regions. There has been a trend towards relocating some of the assembling operations in developed countries. Also, a number of multinational corporations are now investing more, in Ireland or Scotland for example, where unemployment rates are high and where the national Government is willing to give subsidies to attract foreign companies. 36/

Apart from the freedom from tariff barriers and ease of access to major markets, there are technical advantages to be gained from locating assembling operators in Europe. Until recently, this type of work was carried out in two stages: assembly and initial test work was often sent to east or south-east Asia, where labour costs were low and the necessary manual dexterity and visual orientation skills could be bought cheaply; and final tests were done in the semi-conductor company's parent company (often in the United States), where the necessary expensive equipment could be used. Recently, there has been a trend to locate integrated plants in the developed world, where both the assembly and final tests can be done. While progress is being made with assembly robotics, automatic chip-packaging is still some way off, and the trend towards greater on-chip integration means that chip assembly is likely to be a relatively stable or even a growing source of employment within the industry, 37/ but not necessarily in the countries of Asia with low labour costs. With the increased trend towards high-memory and customized chips, quality rather than labour costs is becoming the major criterion for industrial location.

In the electronic consumer goods sector, female employment is also likely to fall because automatic insertion is becoming widely popular in assembly operations. This has been possible because of a redesign in the production process that has resulted in a significant and continuing decline in the number of components involved.

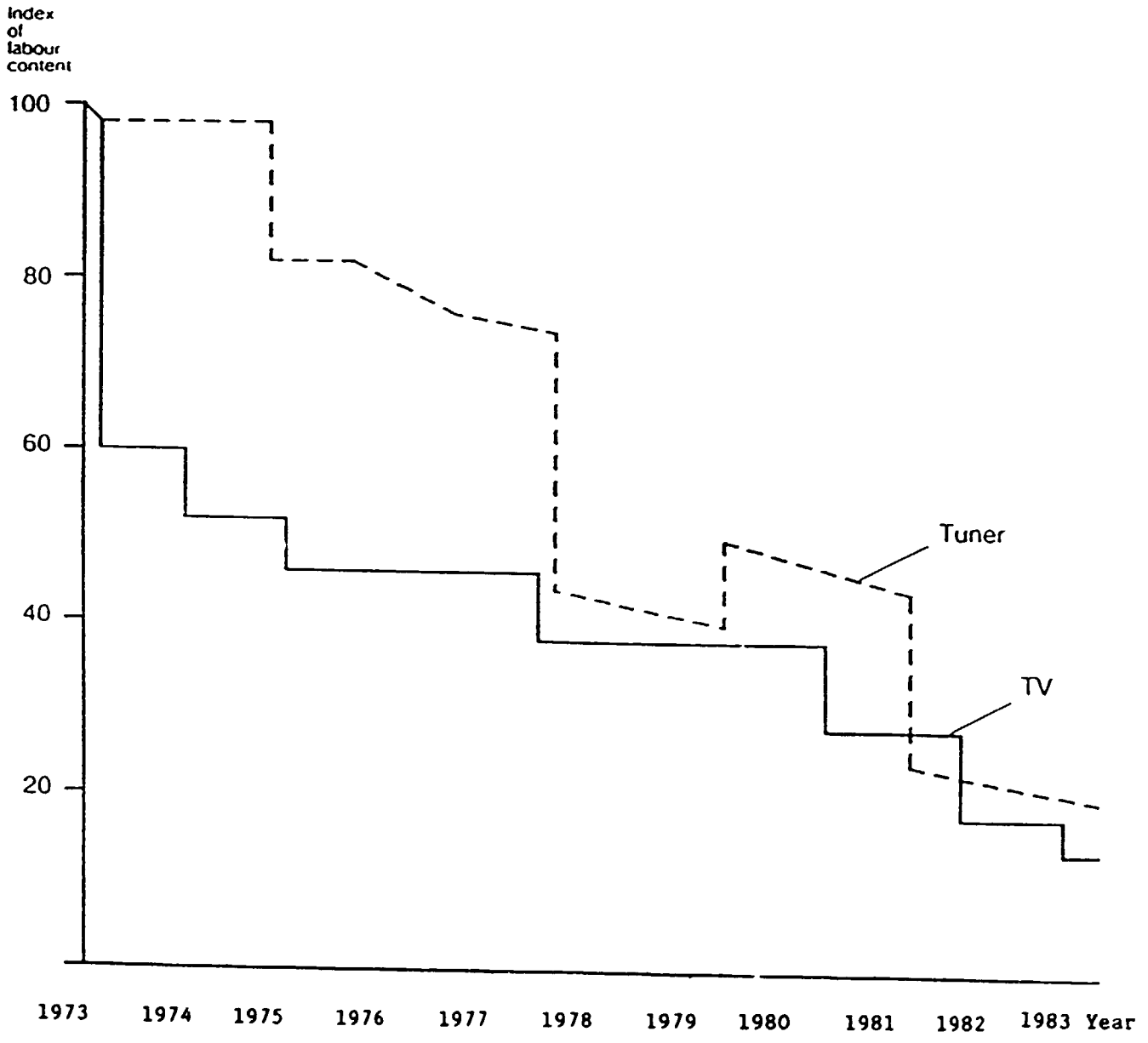
The trends in labour inputs from 1973 to 1983 are illustrated in figure III. Labour costs now represent not more than 10 per cent of the ex-factory costs of all electronic consumer goods. In the case of 14-in. colour television sets, labour costs now account for as little as 5 per cent of ex-factory costs. Differentials in the labour costs are therefore becoming relatively less important in determining decisions on where to locate assembling plants. 38/

Figure II. Semi-conductor market



Source: Dataquest in "World wide shortage of computer memory chips hits manufacturers", The Financial Times, 18 February 1988, p. 6.

Figure III. Trends in the labour content for electronic consumer goods



Source: Based on research by Swasti Mitter, Brighton Polytechnic, and Thannis Chrissafis, University of Sussex.

Relocation back to developed countries is also facilitated by the steady introduction of the "just-in-time" system of inventory control. Because electronic companies produce a variety of products in small batches every day rather than assemble products in large batches for a set period, it is cost effective for component suppliers to adjust the manufacturing requirements of the assembling plant each day. This allows firms to be more responsive to market demand and enables a more uniform flow of production to be achieved. Also, the need for large and expensive storing capacity is drastically reduced. This fine tuning is possible only if the assembling firm can rely on an efficient and reliant network of local subcontractors. Reliance on off-shore suppliers proves to be far less effective.

(c) New skill requirements

Against the background of these technological innovations, it is possible to indicate the changes in skill requirements that will be required of the workers in this industry. Women's access to employment in this sector will depend on their acquiring the relevant skills. While the importance of labour inputs is declining in the electronics industry, the need for expertise is rising in the areas of component integration, manufacturing design, flexible automation and managerial innovations.

The expertise required, as noted above, represents a combination of technical and managerial skills. The occupational breakdown of employment in the electronics industry in the United Kingdom between 1978 and 1984 shows that there have been steady increases in managerial, technical, technological and scientific employment and decreases in less skilled jobs. 39/ The experience of the United Kingdom is typical of the industry in general. While the trend is towards an increased demand for multi-skilled workers in science, technology, design and management, there is little evidence of women making an entry into any of these areas. Even in the developed countries, the occupational breakdown in the electronics industry is similar to that in east and south-east Asia. Ireland is a typical example of a European peripheral region. There, as in Asia and elsewhere, women's representation in the managerial and technological occupations is extremely low (see table 15).

In the age of technology-based comparative advantages, this exclusion of women from occupations that need cognitive skills is wasteful as far as an effective use of human resources is concerned. The consequences are particularly important for the developing countries that are attempting to build a strong indigenous base in computer technology. The Republic of Korea, for example, has a major problem in expanding its electronics industry. Foreign firms refuse to license the relevant technology, since they do not want to encourage direct competition from Taiwan Province of China and the Republic of Korea in products they are producing themselves. This has forced some Asian firms to carry out their own research and development, which is a difficult task because the technologies concerned are changing rapidly. 40/ It also requires a large pool of scarce expertise, which could be developed only by exploiting the latent skills of female and male workers.

Table 15. Gender composition of the electronics work-force in Ireland, 1981

Occupational group	Employees	Percentage of occupational group in electronics work-force	Females	Percentage of females in each group
Managers	725	6.4	32	4.4
Supervisors	581	5.1	141	24.3
Administrative	444	3.9	143	32.2
Professional	607	5.3	45	7.4
Technicians	886	7.8	33	3.7
Clerical	848	7.5	609	71.8
Craftsmen	348	3.1	4	1.1
Non-craft production workers	6 527	57.6	4 695	71.9
Others	372	3.3	93	25.0
Total	11 338	100.0	5 795	
Average				51.1

Source: Graham Day, ed., Diversity and Decomposition in the Labour Market (New York, Gower, 1982), p. 186.

The need to emulate the capital-intensive methods of production of the developed countries may not be so urgent in the current stage of the electronics industry in India. Production there is geared to the national market, and the indigenous industry receives tariff protection. But even so, creating a larger pool of technical and managerial expertise will be of the utmost importance if a developing country, such as India, is to move to the next phase of information technology. Broad-based expertise in the area, drawing upon female and male scientists, will be extremely useful for devising an appropriate information technology from the different vintages of software and hardware currently available on the world market.

In spite of the potential contribution that women can make, there is little evidence so far of their advancement in the electronics industry. Even the numerical gains they enjoyed for a while were transitory. In Japan, the semi-conductor industry changed between 1973 and 1983 from a predominantly female industry to a heavily male one. Similar patterns have been observed in the Federal Republic of Germany and the United Kingdom. 41/ In other words, women's employment prospects in this specific manufacturing sector are extremely limited, unless women are actively encouraged and assisted to be part of the new breed of élite and multi-skilled workers.

E. Human resource planning, policies and options

Introduction

The foregoing discussion has indicated that, numerically, the employment of women in manufacturing has increased in recent years. For some women, increased participation has meant an important first entry into the formal manufacturing sector and new-found economic independence. Also, the increased numbers have engendered a new and growing awareness of women's important contribution to industrialization and shown the need for creative responses from Governments and enterprises to enhance and facilitate women's participation in order to put them into the mainstream of manufacturing and industrial development activities. As illustrated in the previous chapters, women are heavily involved in the production sector of a majority of developing countries, but often without adequate remuneration. Increasingly, Governments and researchers are recognizing that the presence of this supply of labour has enhanced the ability of many countries to create their present industrial base. In order to retain the positions they already have, however, developing countries increasingly need to have a pool of labour that is trained and skilled in new technological and industrial processes.

The number of women entering the labour force is going to increase in coming years. Consequently, the rate of job creation in the manufacturing sectors of developing countries will need to accelerate significantly. Employment will be needed both for women entering the labour force for the first time and for women currently working in production, assembly-line, unskilled jobs that will become redundant owing to new technological developments.

The trends and factors underlying the aggregate increases in women's manufacturing employment reveal a need for the occupational integration of women in all industrial sectors; the large share of female unemployment (especially for younger workers); the rising percentage of female heads of household, the continuing socio-cultural myths regarding women's proper role; and the apparent mismatch that exists between present and future employment, and the training and preparation women receive currently. Such factors point to the need for responses from Governments, employers, trainers and women themselves that can be translated into policies and strategies not only to enhance the integration of currently employed women, but also to prepare women more thoroughly for the technological and organizational changes in the work-place. The aggregate increase in manufacturing employment during the 1980s is positive; however, to retain the present balance and expand it in the future, many measures are needed, including an awareness of major developments that will cause changes in the employment market and an overview of specific implementation measures needed to prepare women for these changes.

1. Responses to technological and organizational changes in the work-place

Laser technology is already affecting the electronics industry, fibre optics the printing and publishing industries and biotechnology is influencing the chemical and food processing industries, while advances in computer technology are major agents of change in all of them, as well, of course, as in the textiles and clothing industries. These are the sectors that, on the

basis of the employment patterns of women in developing countries, merit the immediate and particular attention of policy and decision makers, for they are the industries in which many women are likely to find work. However, other manufacturing sectors too, need to be examined in the present and future interests of women in employment.

(a) Information and computer technology

Many manufacturing industries, including electronics and textiles and clothing, are in a position to adopt fully integrated computer-controlled systems rather than the partial and piecemeal computerized automation adopted so far. In managerial terminology, "islands of automation" can be replaced by an "integrated system" in which one central computer controls machine tools, work stations, the transfer of components and tooling.

Besides the potential overall control that the system offers to management, it has the unique advantage of producing a wide range of goods in small numbers: economies of scale are being superseded by economies of scope, with the help of the flexible manufacturing system. The world economy will be increasingly characterized by an "uncoupling of manufacturing production from manufacturing employment" 42/ starting from the introduction of revolutionary technical changes. As a result, labour costs, and the comparative advantage of the developing countries with low labour costs, will rapidly lose significance.

This transition into the factories of the future will by no means take place overnight. Ample empirical evidence suggests that, while the trend towards higher levels of factory automation is clear, the average level of production automation is still far below what is technologically feasible. In practice, it is still enormously difficult, costly and time-consuming to move from the use of islands of automation to fully integrated systems of production. Even when technically feasible, decisions to invest in high-level automation technology are likely to be held back by economic, social and managerial constraints. 43/ The move towards the factory of the future is already discernible, however, and it is leading to the relocation of automated, previously labour-intensive processes in industries such as textiles and electronics, back in developed countries, although some developing countries are also investing in the new generation of technology.

The implications of this computer technology must be taken into account when designing programmes to train women in new skills. Robots are not likely to replace human labour entirely, but the need for direct operatives will be drastically reduced. At the same time, there will be a need for a new type of core worker, who is functionally flexible, and there is likely to be a greater demand for technical and engineering skills rather than for the dexterity and processing skills needed for assembly-line production that have traditionally made women valuable employees.

The future employment potential for women workers in assembly-line jobs is also threatened by changing market and management strategies. As economies of scope replace economies of scale, companies are relying increasingly on fashion and design management as a prudent market strategy. In some areas, design changes have become a far more important market strategy than price competitiveness. Hence, it has become cost-effective for international

companies to locate the supply near the market in order to reduce turn-around time. Moreover, companies can rely on a supply of cheap labour in the developed world, for example in areas with sizeable immigrant communities or regions hard-hit by unemployment and recession. 21/

Relocation near the market has also been expedited by the adoption of the Japanese "Kan-ban" system of management in other parts of the world. This is a system that relies on an efficient network of local subcontractors that are willing and able to supply material to the main factory "just-in-time"; the system saves the factory the cost and trouble of keeping large inventories of components "just-in-case" they are needed.

Thus, the prospect for attracting foreign investment looks dimmer for a number of developing countries. For investing countries, the size of the domestic market and the quality of the work-force in the prospective host country will be of greater significance than the cheapness of labour, and so they are likely to favour countries such as Brazil, India or Mexico rather than Bangladesh, Sri Lanka or Thailand.

For many of the smaller and less developed countries, therefore, the strategies for human resource development for women workers should be geared more towards diversified patterns of development than towards meeting the needs of export-oriented industries. In spite of the growing publicity about women's employment in export-oriented industries, only approximately 3 million women are engaged in export-led production and, of these, only 1 million are working in export-processing zones. The remainder of the 166 million workers are employed in production activities that are primarily, or to a very large extent, geared to domestic markets. In order to maintain, if not augment, women's share in the world of paid work, education and training programmes should also monitor the gaps in skill needed for this wider section of the market economy.

(b) Biotechnology

The impending spread of biotechnology calls for an effective programme of human resource development, particularly in the context of women's employment. Food processing, pharmaceutical and many other chemical industries, some of the major sources of employment for women in the developing countries, are already undergoing visible changes. The impact of biotechnology is likely to be even more deeply felt than that of computer technology in the late twentieth century, and it will bring revolutionary change to both developed and developing countries. Improved and new methods of agricultural and industrial production in the industrialized countries, for example, will displace more traditional products from the developing countries.

In the sugar industry, for example, the application of biotechnology is displacing workers. Fructose made from maize grown in the industrialized countries is emerging as an economically viable and widely used substitute for cane sugar. This has spelled disaster for cane-sugar-exporting countries, as they can no longer control the price or the quality of their exports. They are losing an export crop and the industrial work-force involved in sugar production and related processing industries is being displaced. 44/

The application of tissue-culture technology may cause further displacement of women from the manufacturing work-force in the developing countries. This technology has distinct advantages over the traditional technique of extracting chemicals from plants. Tissue culture yields products that are more easily purified and ensures that both the quality and the quantity are predictable and planned. Given these advantages, it seems likely that there will be increasing shifts towards tissue-culture production, even in some of the developing countries. This shift, however, will imply the replacement of direct labour, as the number of workers needed for tissue culture production tends to be much lower than that for traditional industries that produce chemicals from plants. Moreover, the tissue-culture factories themselves are unlikely to generate significant employment, since these factories are highly automated through the use of computer-guided production techniques. 45/

It is too early to assess the full implications of the introduction of biotechnology on the structure of employment, yet the emerging evidence indicates that new jobs, in the age of biotechnology, are going to be those that demand a high level of technical skills and managerial competence. 46/ Consequently, women's prospects for retaining their share of employment in industries such as food processing or chemical will depend on the following factors:

(a) The ability of developing countries to create an institutional and educational infrastructure that will promote the necessary skills;

(b) The success of the developing countries in resisting recent moves towards imposing intellectual property law on the fruits of research undertaken in the developed countries;

(c) The willingness and support of national Governments and intergovernmental organizations in extending opportunities to acquire relevant skills to women and men alike.

2. Human resource planning priorities and areas for action

Priority issues for planning human resource measures to further increase women's manufacturing employment, both numerically and qualitatively (i.e. access to jobs at higher occupational levels and more responsible tasks), include the following:

(a) In the short term, identification and monitoring of skill requirements are needed, especially in industrial sectors affected by technological changes. This is especially true for the textiles and clothing and electronics sectors. This information needs to be used as a basis for skill-upgrading programmes for girls and employed women, for career counselling and for instituting skill retraining or employment search assistance for women whose jobs are likely to become redundant;

(b) In both the short and the long term, attention needs to be paid to the overall educational structure for women in developing countries. As part of the human resource planning process, national Governments need to ensure that women have access to education at all levels and to literacy training, in addition to specific industry-related skill training. There is evidence that

inadequate education is more of an obstacle to industrialization and development than lack of physical assets. It is suggested in the World Bank Development report for 1987 that:

> "Returns to investment have generally been higher in education than in physical assets. Economic rates of return to primary education in developing countries have averaged 26 per cent, compared with estimated returns on physical capital of 13 per cent. This suggests that lack of education is a greater obstacle to industrialization and development than lack of physical assets."; 47/

(c) In the medium to long term, women need to acquire more skills in management, technology and science. Training and retraining programmes for girls and adult women are needed. Close attention also needs to be paid to the occupational ladder and career paths for technological and scientific occupations; this includes careful monitoring of the employment market to identify where the demand is growing within an occupational group. In many fields, opportunities for technical support staff outpace those at the professional level, especially in engineering and scientific research. Although the goal should not be to channel women into subordinate technician-level employment, in some countries there may be a greater number of technician-level positions for which women can be trained and at the same time upgrade their occupational standing. In a specific labour market, there should always be a balance between training offered and available jobs;

(d) In both the short and the long term, measures need to be taken at the enterprise level and throughout society to alter gender stereotyping of occupations and workers. Such measures may include closer attention to the content of the curriculum and materials used in occupational and skill-related training, special strategies and materials for guidance and career counselling and attention to affirmative-action and career-path programmes in the work-place;

(e) Attention needs to be given to the social support structure that is needed to enhance women's ability to participate in training and employment-related programmes and to enter employment. Women generally carry the major responsibility for household labour and child care. Additionally, they often face socio-cultural constraints restricting their access to training, market place mobility (i.e. ability to search for better paying jobs in another location) and access to technical assistance and adequate labour market information (e.g. job availability information). A combination of policy responses and strategies geared to the situation of women in a particular labour market are needed. Governments, non-governmental organizations and employers need to collaborate on the development and implementation of appropriate support structures;

(f) Formal-informal manufacturing sector linkages regarding women's participation in the industrial sector need to be examined, understood and utilized when human resource programmes are designed. The number of women working in the informal industrial sector and the tasks they perform need to be identified. The opportunities that the informal sector offers for paid employment should be examined. Technology appropriate for formal sector employment needs to be studied for the development of training and technical co-operation programmes. Additionally, the practice of large firms in the

formal sector subcontracting to small/home-based units in the informal sector needs monitoring as this practice offers opportunities for women as small-scale entrepreneurs.

This list is not a complete set of priorities for planning human resource programmes. In the context of current and anticipated manufacturing-sector trends, however, these are among the important issues requiring consideration. Examples of specific actions that may be needed to translate these priorities into practice, together with the potential implementing bodies, are given below.

3. Role of Governments

The role of Governments in enhancing women's positions could be as follows:

(a) To implement a legislative framework for achieving gender equality;

(b) To provide adequate social infrastructure for facilitating women's entry into manufacturing jobs;

(c) To promote and implement programmes for women's training in science, technology and management;

(d) To monitor carefully the impact of each macro-economic measure on women's employment.

4. Role of international organizations

The role of international organizations could be to assist national Governments in providing women with opportunities to develop their potential so as to increase their contribution to, and accelerate the pace of, industrial development. International organizations could help Governments:

(a) To develop an adequate gender-specific data base to reflect the participation of women in the formal and informal industrial sectors;

(b) To identify areas of future industrial growth so that programmes can be developed to equip women with necessary skills;

(c) To initiate and support studies on the participation of women in industry, including case studies of successful experiences;

(d) To promote the sharing of experience between different countries in running programmes for women in industry;

(e) To ensure that protective legislation is extended to the informal sector as far as possible;

(f) To promote the development of appropriate household and work-place technology and the dissemination of information pertaining to such technology in order:

(i) To reduce the drudgery of women's production work without displacing women;

(ii) To release women from time-consuming household chores to enable them to participate more effectively in industrial development.

International organizations could also:

(a) Support training programmes to meet the demands made by new technologies and to upgrade the skills of women in all industry-related activities, including production, supervision, administration, research and quality control;

(b) Monitor the impact of industrialization on women in developing countries and enter into a dialogue with multinational corporations with a view to improving the situation of women in industry;

(c) Simplify procedures for the identification, implementation and evaluation of projects designed to facilitate women's participation in development;

(d) Use local expertise and work through non-governmental organizations to increase the effectiveness of programmes at national and community level;

(e) Increase the number of professional women working in their own organizations and sensitize their staff to the problems and needs of women in industry.

5. Role of non-governmental organizations and donors

The role of non-governmental organizations and donors could be:

(a) To function as catalysts of change by lobbying national Governments and international agencies to increase the participation of women as equal partners in industrial development; sensitizing employers to the needs of women in industry and to the obstacles to their integration; motivating women to participate in programmes that will enhance their contribution to industry as well as their position in the economy and society; and helping women to be aware of their rights, to improve their self-confidence, to raise their aspirations and to challenge gender role stereotypes and unequal gender relations that limit individual development;

(b) To monitor compliance with United Nations conventions and national labour legislation and to provide feedback on the progress of women in industry; to assess the impact of industrialization of women and to encourage the introduction of measures to ameliorate this and to facilitate women's integration;

(c) To use communication media extensively to disseminate information on emerging trends and gender-related issues in industry;

(d) To mobilize funds and other resources for the support of programmes for women in industry;

(e) To organize and support training programmes that address needs such as basic education, skill upgrading and non-traditional and technical training programmes for younger women; functional literacy programmes for older women and training to improve their productivity and income potential; retraining programmes to prevent the displacement of women from new industry technology; management and marketing skills for women entrepreneurs; and special programmes for disabled women;

(f) To provide a package of services that will help women in low-income families to augment their income in the informal sector. These should include access to capital, credit, technology and industry-related vocational training, and assistance in areas such as quality control, market know-how and entrepreneurship.

(g) To assist in developing credit mechanisms along the lines of the Self-Employed Women's Associations in India, Women's World Banking and the Grameen Bank in order to provide revolving funds and venture capital and to increase the number of women in banking;

(h) To help develop a variety of facilities and services, such as child-care facilities; information and access to appropriate household technology; vocational counselling and guidance services; leadership programmes; and advisory services for entrepreneurs;

(i) To put pressure on trade unions to protect the interests of women, especially factory, piece-rate workers and out-workers;

(j) To mobilize rural and urban women to form producer groups, entrepreneur groups or co-operatives that will help them to achieve self-reliance and sustained economic and human development.

A coherent programme for achieving quantitative and qualitative improvements in women's employment in manufacturing and in other fields will require the direct participation of women themselves at all levels. Hence, the increased representation of women in the decision-making processes of governmental, non-governmental and educational agencies will be a prerequisite for enhancing women's opportunities in the industrial sector. Women's organizations should not relent in demanding such representation, both in the developed and in the developing countries.

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