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DEVELOPMENT AND INTERNATIONAL ECONOMIC CO-OPERATION: LONG-TERM TRENDS IN SOCIAL AND ECONOMIC DEVELOPMENT

Overall socio-economic perspective of the world economy to the year 2000

Report of the Secretary-General

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The term "country" as used in the text of this report also refers, as appropriate, to territories or areas.

For analytical purposes, countries for which relevant data are available have been classified into the following groups:

Centrally planned economies of Europe:	Eastern Europe, Union of Soviet Socialist Republics;
Centrally planned economies of Asia:	Democratic People's Republic of Korea, Mongolia, Viet Nam;
China	China
Developed market economies:	North America, southern and western Europe (excluding Cyprus, Malta and Yugoslavia), Australia, Israel, Japan, New Zealand, South Africa;
Developing countries:	Latin America and the Caribbean, Africa (other than South Africa), Asia (excluding the centrally planned economies of Asia, Israel and Japan), Oceania (excluding Australia and New Zealand), Cyprus, Malta, Yugoslavia;

For particular analyses, the developing countries for which relevant data are available have been subdivided into the following groups:

North Africa:	Algeria, Egypt, Libyan Arab Jamahiriya, Morocco, Tunisia;
Sub-Saharan Africa:	Developing countries in Africa, except North Africa;
Western hemisphere:	Latin America and the Caribbean;
Mediterranean:	Cyprus, Malta, Turkey, Yugoslavia;

West Asia:	Bahrain, Democratic Yemen, Iran (Islamic Republic of), Iraq, Jordan, Kuwait, Lebanon, Oman, Qatar, Saudi Arabia, Syrian Arab Republic, United Arab Emirates, Yemen;
South and East Asia:	Afghanistan, Bangladesh, Bhutan, Burma, Democratic Kampuchea, Fiji, Hong Kong, India, Indonesia, Lao People's Democratic Republic, Malaysia, Nepal, Pakistan, Papua New Guinea, Philippines, Republic of Korea, Singapore, Sri Lanka, Taiwan, Province of China, Thailand;
South Asia:	Afghanistan, Bangladesh, Bhutan, India, Nepal, Pakistan, Sri Lanka;
East Asia newly-industrialized countries:	Hong Kong, Republic of Korea, Singapore, Taiwan, Province of China;
High income oil exporters (countries above $US 11,000 per capita in 1980):	Bahrain, Brunei, Kuwait, Libyan Arab Jamahiriya, Qatar, Saudi Arabia, United Arab Emirates;
Other high income countries and subregions (between $US 2,000 and $US 11,000 per capita in 1980):	Algeria, Argentina, Chile, Gabon, Hong Kong, Iran (Islamic Republic of), Iraq, Mexico, Singapore, Taiwan, Province of China, Uruguay, Venezuela, West Asia oil importers (Jordan and Syrian Arab Republic);
Middle income countries and subregions (between $US 700 and 2,000 per capita in 1980):	Bolivia, Brazil, Central America and the Caribbean, Colombia, Ecuador, Malaysia, Morocco, Nigeria, Paraguay, Peru, Philippines, Republic of Korea, Thailand, Tunisia;
Low income countries and subregions (below $US 700 per capita in 1980):	Developing Africa and South and East Asia (except as included in the three preceding income groups);
Other oil-exporting countries:	Angola, Algeria, Cameroon, Congo, Ecuador, Egypt, Gabon, Indonesia, Iraq, Iran (Islamic Republic of), Nigeria, Oman, Syrian Arab Republic, Trinidad and Tobago, Venezuela;
Major exporters of manufactures:	Brazil, Hong Kong, India, Republic of Korea, Singapore, Taiwan, Province of China, Yugoslavia;

Other manufacturing-oriented countries:	Argentina, Chile, Colombia, Costa Rica, Cuba, Cyprus, El Salvador, Guatemala, Côte d'Ivoire, Malaysia, Malta, Mexico, Morocco, Nicaragua, Pakistan, Paraguay, Peru, Philippines, Sri Lanka, Swaziland, Thailand, Turkey, Uruguay, Zambia, Zimbabwe;
Least developed countries:	Afghanistan, Bangladesh, Benin, Bhutan, Botswana, Burkina Faso, Burma, Burundi, Cape Verde, Central African Republic, Chad, Comoros, Democratic Yemen, Djibouti, Ethiopia, Equatorial Guinea, Gambia, Guinea, Guinea-Bissau, Haiti, Kiribati, Lao People's Democratic Republic, Lesotho, Malawi, Maldives, Mali, Mauritania, Nepal, Niger, Rwanda, Samoa, Sao Tome and Principe, Sierra Leone, Somalia, Sudan, Togo, Tuvalu, Uganda, United Republic of Tansania, Vanuatu, Yemen;
Primary commodity and services exporters (other than the least developed countries):	Bolivia, Caribbean and Central America, Democratic Kampuchea, Fiji, Ghana, Guyana, Jordan, Kenya, Lebanon, Liberia, Madagascar, Mozambique, Namibia, Papua New Guinea, Reunion, Senegal, Seychelles, Solomon Islands, Suriname, Tunisia, Zaire;
Highly indebted developing countries:	Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Côte d'Ivoire, Ecuador, Jamaica, Mexico, Morocco, Nigeria, Peru, Philippines, Uruguay, Venezuela, Yugoslavia.

I. INTRODUCTION

A. Mandate and background

1. The overall socio-economic perspective of the world economy to the year 2000 is a periodic assessment of long-term trends in world economic and social development. The present report is intended to serve as a quantitative and qualitative framework for considering a number of long-term issues that the international community will have to address in the 1990s.

2. The first comprehensive report on long-term trends in economic development was submitted to the General Assembly in 1982 at its thirty-seventh session (A/37/211 and Corr.1, 2 and 4 and Add.2). Pursuant to General Assembly resolution 37/249 of 21 December 1982, the report was revised and updated in May 1984 in connection with the review and appraisal of the International Development Strategy. Subsequently, a comprehensive report was prepared in 1985 and submitted to the Assembly at its fortieth session (A/40/519). In its resolution 40/207 of 17 December 1985, the General Assembly requested that the next comprehensive report be prepared in 1987 and submitted to it at its forty-second session, but it later agreed that the report should be postponed and submitted to it at its forty-third session, through the Economic and Social Council.

3. The present report was prepared in the Department of International Economic and Social Affairs, and contributions were provided by relevant units of the United Nations Secretariat and specialized agencies. At an early stage in its preparation, several units contributed their assessments of the prospects for the world economy to the year 2000 at meetings of the Task Force on Long-term Development Objectives of the Administrative Committee on Co-ordination and its Technical Working Group, in June and September 1987.

4. The authors of the report subsequently benefited from comments and suggestions made by the Committee for Development Planning, which reviewed work in progress at a meeting of its Working Group on the Changing Global Economy, in December 1987, and at its twenty-fourth regular session in April 1988. The summary of the report 1/ was submitted to the Economic and Social Council at its second regular session, held from 6 to 29 July 1988.

5. The report attempts to place recent events in historical perspective by reviewing a number of trends. A baseline scenario to the year 2000, prepared on the assumption of essentially unchanged policies, is presented. A number of sectoral issues of special importance to international development are then briefly reviewed.

B. Summary

6. The following broad themes are developed in the report:

(a) The world economy as a whole has grown more slowly in the 1980s but there has been remarkable progress in some countries - notably in Asia - along with

st gnation or even serious setbacks in Africa and Latin America. The gap between the richest and the poorest countries in the world has widened, and so have the differences among the developing countries. The majority of the world population live in countries where average economic conditions have been improving, especially when account is taken of the very rapid growth of the Chinese economy. But, for the majority of developing countries, the 1980s have been years of falling per capita incomes and standards of living;

(b) The reasons for the state of the world economy include the slowdown of growth in developed economies, the volatility in international financial and foreign exchange markets, and the uncertainty that prevails with regard to the manner and timing of the resolution of the international debt problem;

(c) The model of the world economy that underlies the baseline scenario projecting major macro-economic variables to the year 2000 incorporates the currently prevailing constraints on world economic growth. In that scenario, the developed market economies would grow at 2.5 to 3 per cent in the 1990s, and the centrally planned ones, at 4 per cent. In South and South-East Asia, overall gross domestic product (GDP) growth would be in the order of 5 per cent, substantially faster than the rate of population; and in China it would be even faster. However, in Latin America and Africa, per capita growth would be negligible;

(d) Alternative scenarios exploring the impact of realistic economic policy changes have been studied. These might add about one half of a percentage point to the rate of growth in developed market economies and as much as one or two percentage points to the rate of growth of developing countries;

(e) Governments will, however, have to anticipate many structural changes and difficult policy issues in the next decade. Demographic trends are fairly predictable and provide a good starting-point for their analysis. The fastest growth (3 per cent) will occur in Africa, where the task of recovery and restoration of self-sustained growth will be particularly difficult. The labour force in developing countries will generally grow by 2.5 to 3 per cent, while it will grow by less than 1 per cent in developed market economies. Employment is likely to grow more slowly than the labour force in most countries, and unemployment will be a concern for all groups of countries;

(f) On the one hand, the use of energy - in particular, of hydrocarbons - is expected to continue to grow more slowly than GDP for the remainder of the century. On the other hand, growth of energy consumption in developed market economies will be met by imports, which will contribute to changes in the structure of world trade, and real prices of oil may rise;

(g) Heavy pressures on the global ecological system have given rise to a range of critical issues of ecological degradation and pollution, which are rapidly coming to a head. As in this decade, new and unexpected threats may also emerge, and there will be a need for a capability of quick international response;

(h) Relentless population growth and rural-to-urban migration raise a need for shelter, water, sanitation and other public amenities in urban and rural

habitats, which has to be met in innovative ways that generate employment and draw on local resources;

(i) Human resources have long been neglected in development strategies or approached in a piecemeal fashion. Problems of education, health, social integration, the status of women, and crime and drug abuse will call for a clearer vision of the objectives of development;

(j) One of the outstanding characteristics of the world economy at the present time that will persist in the next decade is the pressure of structural change. A major cause of the need for structural adjustment is the rapid emergence of new technologies, which destroy old capital and require new capital formation. This is hampered by uncertainties about future monetary and financial conditions, which influence patterns of comparative advantage;

(k) The growth of capital formation has slowed down in all regions of the world in the 1980s. However, the evident success of some developing countries has directed attention to the role of entrepreneurship. Efforts to stimulate entrepreneurship and managerial capacity in order to improve capital efficiency have attracted great interest, and there are enough instances of successful local experiences to put such programmes on the agenda for the next decade.

7. Past experiences of attempting to forecast and project long-term trends have not been very successful. The expectations at the beginning of the 1970s were overthrown by the turbulence of the world economy, and the expectations for the 1980s proved to be even more misplaced. There is no generally agreed explanation for the slowdown in the 1980s, although many of its elements seem reasonably clear. The present projections for the 1990s should be seen in this light. Unanticipated shocks and policy responses will probably make for a different outcome, for better or for worse. The purpose of contemplating the outlook for the 1990s is not to predict the future but to prepare for the issues that will arise - to the extent that they can now be foreseen.

II. WORLD ECONOMIC PERFORMANCE AND POLICY IN THE 1980s

8. The world economy has grown more slowly and with greater disparities in national performance in the 1980s than in the previous decade. Gross world product measured in real terms rose 2.5 per cent a year from 1980 to 1985, while population increased by 1.7 per cent. As may be seen in table 1, rapid inflation and high unemployment in the economically advanced countries continued into the early 1980s and were followed by a severe slowdown in economic activity in 1982. This recession was transmitted to many developing countries.

9. For many countries, the decade of the 1980s has been a critical period. Some have rapidly adjusted to new conditions, while others have suffered continued disappointments and mounting difficulties. Except for during the recession early in the decade, rapid growth continued in the newly-industrialised countries in South-East Asia, where output increased at 7.6 per cent a year. A key element in their success has been the ability to adjust to significant declines in their terms of trade and to expand export sales in both traditional and new markets. The

Table 1. Growth of production and per capita gross domestic product in the world economy a/

(Percentage)

Region	1961-1965	1966-1970	1971-1975	1976-1980	1981-1985	1986-1987 b/
Growth of gross domestic product						
World	5.3	5.2	3.8	3.6	2.5	3.1
Developed market economies	5.3	4.6	3.0	3.4	2.2	2.8
North America	4.8	3.0	2.6	3.3	2.5	3.0
Europe	4.9	4.6	3.0	3.0	1.4	2.6
Other developed countries	8.2	9.6	4.3	4.5	3.6	3.1
Centrally planned economies of Europe c/	6.0	7.4	6.2	3.9	3.3	3.4
China	-2.9	7.2	5.5	6.0	9.4	8.3
Developing countries	6.0	6.3	5.7	4.2	1.8	2.8
North Africa	12.0	10.6	0.0	7.3	2.8	-1.0
Sub-Saharan Africa	3.4	5.0	4.4	1.3	0.9	0.0
Western hemisphere	6.6	5.6	4.7	4.9	0.7	3.0
West Asia	8.7	7.2	9.9	0.5	-0.6	-2.4
South and East Asia	3.8	6.2	6.0	6.3	4.8	5.5
Mediterranean	5.4	5.8	6.8	4.6	2.7	4.1
Growth of gross domestic product per capita						
World	3.2	3.1	1.8	1.9	0.7	1.4
Developed market economies	4.0	3.7	2.0	2.6	1.5	2.2
North America	3.2	1.9	1.6	2.3	1.5	2.1
Europe	3.9	4.0	2.3	2.7	1.2	2.4
Other developed countries	6.8	9.1	2.7	3.2	2.5	2.0
Centrally planned economies of Europe c/	4.6	6.6	5.3	3.0	2.4	2.5
China	-5.2	4.5	3.2	4.5	8.1	7.1
Developing countries	3.4	3.6	3.1	1.8	-0.5	0.5
North Africa	8.8	7.6	-2.6	4.3	-0.2	-2.0
Sub-Saharan Africa	0.9	1.9	1.6	-1.7	-2.1	-3.6
Western hemisphere	3.8	2.8	2.2	2.4	-1.7	1.0
West Asia	4.9	3.8	6.6	-2.9	-3.8	-5.6
South and East Asia	1.4	3.5	3.5	4.0	2.6	3.5
Mediterranean	3.4	3.9	4.8	3.0	1.0	2.4

Source: Department of International Economic and Social Affairs of the United Nations Secretariat.

a/ Average annual rates of growth measured in 1980 prices and exchange rates; differing country coverage within some regional groupings and a more recent cut-off date for data revisions may result in small differences between these figures and those shown in other reports of the Department.

b/ Preliminary and based on incomplete country coverage.

c/ Net material product.

petroleum-exporting developing countries, benefiting from the large rise in oil prices that occurred in 1979, experienced a large increase in their export earnings and increased their imports correspondingly. However, as the demand for oil declined and the supply increased in response to the higher price, their trade surplus fell sharply. Growth in the least developed countries was especially poor; per capita income fell in most of them, in particular, in sub-Saharan Africa, which was also ravaged by drought, pestilence, war and famine.

10. In highly indebted developing countries, falling prices for export commodities, rising real interest rates, and rapidly growing debt service have led to a need for austerity programmes to restore conditions for sustainable growth. Their initial response was to adjust their international accounts by reducing domestic demand and curtailing import-intensive investment. In addition, they have generated large trade surpluses in order to service their foreign debt, even as their terms of trade declined. A strong dollar made it even more difficult for them to service dollar-denominated debt. As their capacity to import declined, adjustment costs rose and the real cost of debt repayment increased. Because the export cost of their debt service became much higher than when the debt was undertaken, they could meet their repayment obligations only by going further into debt. Hence, despite a marked slowdown in growth, external debt continued to rise in the capital-importing developing countries, reaching 53 per cent of gross domestic product and 230 per cent of export earnings during the period from 1985 to 1987.

11. These adjustments worsened the distribution of income and lowered living standards. In Africa and Latin America, where the setback to economic growth has been most pronounced, unemployment and underemployment became more severe as firms and Governments faced declining demand and financial and material shortages. During the period from 1983 to 1985, for example, of 15 Latin American countries that collect such data, 12 recorded urban unemployment rates of between 10 and 19 per cent. Real wages fell as devaluations, wage restraints and inflation in many countries reduced the purchasing power of the poorest segments of the population. Of major concern was the increase in real food prices, in particular, in the countries that rely on food imports.

12. Reflecting the growing numbers of absolute poor and a loss of productive capacity, it is estimated that during 1981-1987 per capita income fell at an average annual rate of 1 per cent in Latin America and 2.5 per cent in sub-Saharan Africa. In addition to deteriorating external conditions, the Sahel countries were devastated by several years of drought, with consequent losses of livestock and arable land, widespread malnutrition and outright famine.

13. In response to the shortfalls in national income and government revenues, Governments were forced to reduce expenditures. Many reduced them for essential social services as well as for capital investment. Real per capita spending for health, education and housing has declined in many countries.

14. Uncertainty about the manner in which unsustainable trends will ultimately be resolved clouds the prospects for the world economy. Uncertainty prevails as to how the problem of developing-country debt will be resolved, how the fiscal and current account imbalances among the developed market economy countries will be

reduced, whether the international trading environment will become more or less protectionist, and what the level and composition of net capital flows to developing countries will be. These uncertainties and the prospect of continued volatility in exchange rates and interest rates discourage investment and retard economic development.

III. QUANTITATIVE SCENARIOS FOR THE WORLD ECONOMY TO THE YEAR 2000

A. Baseline scenario

15. As a starting-point for analysing the prospects for long-term world economic development, a baseline scenario has been elaborated. Its purpose is to describe the most likely evolution of the world economy on the assumption of unchanged government policy stances. Since policies will, in fact, change in response to events, the baseline scenario is not meant to be a prediction of the future, but rather a point of departure for the consideration of appropriate policies. Even under the assumption that no major policy initiatives will be introduced to deal with the unprecedented economic imbalances that have arisen during the present decade, significant changes would take place in the allocation, composition and distribution of world production and incomes. Populations in many of the poorest developing countries would, however, continue to experience acute poverty with little prospect for improvement. Later in the present section, and in other sections, the impacts of alternative policies are examined. This analysis indicates that substantial improvements in the prospects for world economic growth could be realised through enhanced international co-operation and stronger domestic policies aimed at overcoming structural obstacles of growth.

16. Consistent with the concept of a "surprise-free" scenario, the long-term growth performance in all countries (e.g., investment effort, investment efficiency, interest rates and saving behaviour, oil prices and inflation rates, employment and productivity trends, changes in the terms of trade, the rate of growth of world trade) remain largely unchanged from recent and forecast trends. As a result, a state of fundamental disequilibrium continues to describe the course of world economic activity into the foreseeable future, with large internal and external deficits and surpluses in most world regions and marked contrasts in the pace of economic expansion in different areas of the world. Despite large imbalances and relatively slow growth, however, sufficient adjustment is assumed to take place to avoid a major economic downturn or financial crisis. As assessed under these circumstances, the world economy of the year 2000 presents a picture of both economic advance and decline, of structural change and stagnation, and of rapid improvements in levels of living in some countries and rising numbers of people living in absolute poverty in others.

17. In preparing the baseline scenario, the principal macro-economic variables of the world economy were projected separately for two subperiods. For the period from 1986 to 1990, preliminary estimates for 1986 and 1987 and baseline forecasts for 1988 to 1990 based on Project LINK and Secretariat assessments were used. 2/ Beginning in 1991, world economic growth has been projected using the Global econometric model of the Secretariat on the basis of the assumptions mentioned

above. In terms of projected long-term production performance, these assumptions have been translated country by country into expected magnitudes for investment effort and investment efficiency, and GDP growth derived as the share of investment in GDP divided by the incremental capital output ratio. Given the projections for GDP and estimated behavioural relationships, macro-economic patterns of resource allocation, trade flows, and output by industrial origin have been derived separately for each country included in the model and summarized over region groups.

1. Domestic and foreign resource mobilization

18. The share of investment in GDP computed on the basis of national income accounts is an indicator of the formation of physical capital, such as equipment, buildings, and other physical infrastructure. A high rate of investment facilitates technological change, since adding new equipment to the existing stock or rapidly replacing aging equipment increases the proportion of output produced with improved technologies. It neglects, however, investment in human resources, which is a major contributor to total factor productivity.

19. The capacity to invest, in turn, depends upon the ability of countries to mobilize internal savings and to attract a net inflow of savings from abroad. During the period from 1971 to 1985, major changes occurred in investment trends and their sources of financing.

20. Historical and projected figures relating to real consumption and saving patterns and levels per capita in different world regions are shown in table 2. Given the modest growth expected to take place under the baseline, the percentage share of government and private final consumption expenditure in the gross product of the developed market economies is not expected to change; similarly, the share of gross national saving in their GDP is projected to change little during the next decade. In contrast, the share of total consumption in the GDP of developing countries is expected on average to fall slightly, but with sharp differences among developing country regions. In the high income oil exporters and heavily indebted countries, on the one hand, where policy makers are constrained from expanding domestic demand, the share of consumption is projected to fall noticeably; on the other hand, in South and South-East Asia, domestic policies are expected to be more stimulative in nature, partly in response to a need to correct substantial surpluses in the current account of their balance of payments. For the highly indebted countries in the first two regions, the slower growth and reduced consumption shares projected under the baseline illustrate the real costs of adjustment to the large real and financial imbalances which have accumulated during the present decade.

21. Although the adjustment measures already taken in many countries have been incorporated in the baseline, it is expected that they will yield only limited results in the near term in changing prevailing macro-economic spending patterns. One key problem requiring a substantial period of adjustment is the elimination of the large internal and external imbalances that arose in the late 1970s and early 1980s. With improved policy co-ordination among all countries and appropriate fiscal and monetary policies, however, the baseline projection assumes that saving-investment imbalances will be progressively reduced over the period to the

Table 2. World resource allocation and saving: historical and projected under a baseline scenario a/

Country group	Share of group total gross domestic product: Government consumption	Private consumption	Saving	Investment	Internal balance	Levels per capita in 1980 United States dollars: Private consumption	Gross domestic product
1970							
World	15.2	59.9	24.4	24.3	0.1	1 305	2 178
Developed market	17.7	59.5	23.0	25.3	-2.3	4 521	7 596
Centrally planned economies of Europe b/	4.0	70.0	26.0	24.8	1.2	1 526	2 227
Developing countries	10.0	56.7	29.3	18.0	11.3	442	779
High income oil exporters	5.3	9.8	71.8	4.5	67.3	1 259	12 884
Other high income	10.0	48.9	36.7	20.0	16.7	1 367	2 795
Middle income	10.8	70.5	16.0	18.5	-2.6	655	928
Low income	10.7	72.4	15.7	19.3	-3.7	190	275
Least developed	12.3	80.5	7.1	14.7	-7.6	251	312
China b/	6.0	60.7	33.3	33.4	-0.1	89	147
1980							
World	15.1	61.5	23.6	23.6	0.0	1 622	2 636
Developed market	17.1	61.0	22.4	22.7	-0.4	5 836	9 563
Centrally planned economies of Europe b/	4.7	70.6	24.8	24.4	0.4	1 825	2 587
Developing countries	13.0	59.6	26.7	25.2	1.5	595	999
High income oil exporters	19.1	26.4	57.8	20.2	37.5	3 576	13 562
Other high income	13.8	56.6	28.7	28.5	0.2	1 833	3 237
Middle income	10.8	66.1	21.2	24.8	-3.5	886	1 340
Low income	12.1	69.3	18.2	22.2	-4.0	256	369
Least developed	12.0	83.1	5.4	16.2	-10.8	279	336
China b/	8.1	60.6	31.3	31.8	-0.5	150	247
1985							
World	15.4	62.6	21.6	22.6	-0.9	1 705	2 725
Developed market	17.4	61.3	21.4	22.2	-0.7	6 266	10 225
Centrally planned economies of Europe b/	4.9	72.3	22.8	23.6	-0.8	2 109	2 915
Developing countries	14.2	61.7	22.1	22.1	0.0	600	971
High income oil exporters	29.7	41.5	27.6	34.2	-6.6	3 747	9 019
Other high income	14.0	56.5	22.7	22.7	3.9	1 703	3 011
Middle income	11.3	66.0	20.8	19.3	1.5	879	1 332
Low income	14.4	69.4	15.8	21.6	-5.8	256	369
Least developed	12.2	83.8	4.4	16.1	-11.7	272	325
China b/	8.7	68.1	23.3	33.0	-9.8	235	346
Average 1990-2000						2000	
World	14.5	61.6	23.4	23.6	-0.2	2 128	3 438
Developed market	16.9	60.6	22.1	22.4	-0.3	8 322	13 551
Centrally planned economies of Europe b/	4.6	69.9	25.5	23.8	1.7	3 250	4 632
Developing countries	12.8	61.7	23.7	22.5	1.2	764	1 233
High income oil exporters	15.0	36.8	50.8	31.1	19.6	3 494	8 674
Other high income	13.9	53.6	30.2	23.5	6.7	1 875	3 464
Middle income	11.9	67.3	18.6	20.8	-2.2	1 168	1 757
Low income	12.6	70.9	16.0	21.8	-5.8	355	498
Least developed	12.0	82.9	5.4	16.9	-11.4	267	325
China b/	7.2	56.6	36.2	45.4	-9.2	418	797

Source: Department of International Economic and Social Affairs of the United Nations Secretariat.

a/ Measured in 1980 prices and exchange rates.

b/ Based on data for net material product.

year 2000. In the developed market economies, this adjustment is largely accomplished through an expected slowdown in capital formation. In the developing countries, however, investment effort is assumed to increase, with the adjustment process centred on reducing government spending. As the share of government consumption expenditure is reduced, savings will be released for productive investment, with the result that the pace of growth in these countries under the baseline accelerates slightly as the year 2000 approaches. Nevertheless, the expected rate of economic growth, in particular, in the low income and least developed countries, remains slow when compared with its long-term trend.

22. During the period from 1971 to 1980, most groups of developing countries increased their shares of investment in GDP, but that trend was reversed during the period from 1981 to 1985. In the developed economies, investment shares tended to fall during the 1970s and, with the exception of North America, did not recover during the first half of the 1980s. In the centrally planned economies of Europe, investment shares first rose, then fell, during the 1970s and fell further during the period from 1981 to 1985.

23. Among the developing countries, the increases in investment shares before the 1980s were due to increased export earnings in the case of oil-exporting countries and fast-growing exporters of manufactures, and the access to international capital markets in the case of many others. In those countries with buoyant export earnings, domestic savings ratios rose, while they fell in most of the major borrowing countries. The higher rates of investment during the 1970s were associated with higher GDP growth rates and considerable structural change. The abrupt deterioration of the world economy in the early 1980s depressed export earnings and then led to a negative net transfer of financial resources to the developing countries. Domestic savings ratios first tended to fall but have since risen in response to the implementation of balance-of-payments adjustment programmes. The improved savings performance has not, however, led to increased investment shares, since the savings have been used to service the external debt.

24. In the developed market economies, the decline in investment/GDP ratios was due to a combination of factors: higher interest rates, fiscal constraints, the two oil-price shocks, lower GDP growth and profits, and greater uncertainty generally. In the centrally planned economies of Eastern Europe, lower investment shares were due to rising consumption shares and balance-of-payments constraints.

25. Falling investment shares were not the only factor affecting economic growth in the developing countries. Other measures of productivity, such as the incremental capital output ratio, labour productivity and the net rate of return on fixed capital, have all tended to worsen.

26. Recent commitments to increasing the resources available to multilateral development institutions and increasing bilateral official development assistance suggest that official development finance can be expected to increase at an annual average rate of 2 to 3 per cent in real terms in the medium term. Private capital flows, comprising mainly private direct investment but also international bank lending to countries without debt difficulties and - in the context of concerted lending - to others, may also continue to grow slowly in real terms. Thus, current

account deficits as a share of GDP in the developing countries could probably continue to be financed at present levels.

27. The projected investment shares for the 1990s are based on those observed during the 1983-1985 period, and consequently reflect the internal and external financing constraints currently impeding investment in many countries. In some economies, the degree of prospective investment effort has been further adjusted to reflect likely financing constraints associated with debt repayment obligations. By assuming a return to the 1983-1985 average, the baseline projection incorporates a somewhat higher investment share than at present, but considerably lower than those recorded during the 1970s and 1980s. In the case of the developed market economies, this assumption results in a projected average investment/GDP ratio of 22.4 per cent - slightly higher than the 21.8 per cent registered in the 1981-1985 period but significantly below that recorded during the 1970s (see table 3). Much of this projected rise in investment effort may be traced to an upturn in investment in North America during the economic recovery which began in 1984 and is expected to continue over the medium and longer term. In many developing country regions, however, persistent or emerging internal and external constraints are seen as continuing to impede the pace of their capital formation and reducing its productivity, especially in the highly indebted countries in Latin America and Africa. In the centrally planned economies of Eastern Europe and the Soviet Union, investment shares are expected to stabilise at about 24 per cent of net material product, following a secular decline in investment effort dating from the late 1970s. Finally, in China, substantial increases in investment outlays are projected as these countries expand and become more outward-oriented.

Table 3. Investment trends and world economic growth: historical and projected under a baseline scenario a/

(Percentage)

Period	Average investment share	Implicit ICOR b/	Growth rate of GDP	Growth rate of population	Growth rate of GDP per capita	Average investment share	Implicit ICOR b/	Growth rate of GDP	Growth rate of population	Growth rate of GDP per capita
World						**Developing petroleum-exporting countries**				
Historical										
1971-1980	23.6	6.4	3.7	1.8	1.9	20.8	4.0	4.2	3.0	1.2
1981-1985	21.9	9.8	2.3	1.6	0.7	27.5	53.1	0.5	2.7	-2.2
Preliminary and forecast										
1986-1990	23.0	8.2	2.8	1.6	1.2	25.2	20.9	1.4	2.6	-1.2
Projected										
1991-2000	22.3	7.2	3.3	1.5	1.8	24.0	6.5	3.7	2.4	1.3
Developed market economies						**Major exporters of manufactures**				
Historical										
1971-1980	23.9	7.6	3.2	0.9	2.3	26.7	3.7	7.0	2.2	4.8
1981-1985	21.7	10.3	2.1	0.7	1.4	23.8	7.0	3.6	1.9	1.7
Preliminary and forecast										
1986-1990	23.3	9.9	2.4	0.7	1.8	22.4	4.6	4.9	1.8	3.1
Projected										
1991-2000	22.3	8.2	2.7	0.6	2.1	24.2	5.0	4.8	1.5	3.2
Centrally planned economies of Europe c/						**Highly indebted developing countries**				
Historical										
1971-1980	25.7	5.0	5.1	0.8	4.3	22.7	4.5	4.9	2.6	2.2
1981-1985	23.6	6.8	3.5	0.8	2.7	19.4	136.5	0.6	2.5	-2.0
Preliminary and forecast										
1986-1990	23.7	6.2	3.8	0.8	3.0	16.3	7.5	2.3	2.4	0.0
Projected										
1991-2000	23.8	6.1	3.9	0.7	3.2	18.3	5.6	3.2	2.2	1.0
Developing countries						**Least developed countries**				
Historical										
1971-1980	22.5	4.2	5.0	2.5	2.5	14.8	4.1	3.6	2.5	1.1
1981-1985	22.9	13.6	1.8	2.4	-0.5	16.4	8.0	2.0	2.9	-0.9
Preliminary and forecast										
1986-1990	21.5	6.5	3.3	2.2	0.9	15.0	5.1	3.1	3.0	0.1
Projected										
1991-2000	22.7	5.5	4.1	2.1	2.0	16.6	5.4	3.1	3.0	0.1
China b/						**Primary commodity and services exporters**				
Historical										
1971-1980	33.6	5.6	6.0	1.8	4.2	12.5	7.5	2.8	2.9	-0.1
1981-1985	30.5	3.6	8.3	1.2	7.1	18.9	17.0	1.2	3.0	-1.8
Preliminary and forecast										
1986-1990	36.7	4.6	7.8	1.2	6.6	16.5	7.4	2.3	3.0	-0.7
Projected										
1991-2000	46.4	7.0	6.6	1.1	5.5	19.3	7.9	2.4	3.0	-0.6

Source: Department of International Economic and Social Affairs of the United Nations Secretariat.

a/ Measured in 1980 prices and exchange rates.

b/ Incremental capital-output ratio.

c/ Based on data for net material product.

2. Capital efficiency

28. In the turbulence of the 1980s, when output in many economies in some years has actually fallen in spite of continued investment, it is difficult to assess the contribution of investment to growth. It is clear, however, that all cases of rapid growth have been associated with high rates of capital formation, and also that setbacks in output ex post, as compared to the expectation when investments were made, have been linked to such factors as unexpected worsening of international market conditions and mismanagement of resources.

29. The assumption made in the baseline scenario is that the efficiency of capital in most countries will improve from the historically low levels registered during the early 1980s, but will none the less remain below those observed during the decade of the 1970s. Thus, for the developed market economies, it is assumed that about $8 of investment must be undertaken to increase the productive capacity of these economies by $1 in the 1990s, as compared to an average of $7.60 in the 1970s and over $10 during the first half of the 1980s. Capital efficiency is expected to be higher in the case of the developing countries, with only $5.50 of investment expenditure required on average to increase productive capacity by $1 in the 1990s, but with significant variations in expected performance among individual countries.

30. Under these assumptions, debt indicators, such as the ratio of debt service to exports and of debt to GDP, would slowly improve in the case of developing countries. Major imbalances among the major industrialised countries would also continue to improve. GDP growth, however, would be modest and, in many developing countries, it would not permit increases in per capita income.

3. World GDP growth

31. World economic growth is expected to be significantly below its longer-term trend but higher than recent experience. During the 1970s, aggregate gross world product rose at an annual rate of 3.7 per cent, with the increase output in the developing countries exceeding 5 per cent each year on average. The world-wide recession of the early 1980s saw a marked decline in economic growth in all major world regions, with the rate of expansion in the developing countries falling precipitously to less than 2 per cent a year on average from 1981 to 1985. A continuing recovery in world economic growth has been forecast for the period until 1990, but it is expected to be very uneven, with absolute declines in GDP per capita for many African developing countries and only small increases in developing countries in the Western hemisphere. 3/

32. For the developed market economies, following an expected recovery to an average rate of growth of 2.4 per cent a year in the late 1980s, the baseline projection is a growth rate of 2.7 per cent on average during the decade of the 1990s, 4/ while the centrally planned economies of Europe would recover to a rate of 3.9 per cent annually over the same period. On a per capita basis, both of these figures imply steady improvements in average living standards. In the developing countries, the average growth rate of gross domestic product would be only 4.1 per cent a year. Although this represents considerable improvement over recent trends, it remains considerably less than the 5.1 per cent annual expansion achieved from 1971 to 1980, and, given the marked diversity of expected performance in different developing country regions, it implies negligible growth or absolute declines in per person output levels in most of the heavily indebted and least developed countries (see table 4).

33. The per capita income per capita of the developing countries, in 1980 United States dollars, is expected to increase from $971 in 1985 to $1,233 in the year 2000, under the baseline scenario. However, differences among country groups are large and will increase. The average per capita income of the developing countries in the western hemisphere is projected to be $2,362 in the year 2000, whereas the average for 49 countries in Africa is expected to be only $697. Within Africa, average per capita income is projected to range from under $100 to over $4,000 in the year 2000; in many countries it will be lower than in the mid-1980s. The least developed countries are projected to exhibit no change in average per capita income by the year 2000, remaining with the 1985 figures of $325.

Table 4. Gross domestic product, per capita levels and growth rates

	Growth rates				GDP per capita in 1980 United States dollars	
	GDP		GDP per capita			
	1986-1990	1991-2000	1986-1990	1991-2000	1985	2000
World	2.8	3.3	1.2	1.8	2 725	3 438
Developed market	2.4	2.7	1.8	2.0	10 225	13 551
North America	2.3	2.6	1.4	1.8	12 274	15 749
Europe	2.3	2.4	1.9	2.0	9 010	12 024
Other developed	3.1	3.7	2.1	2.7	9 116	13 207
Centrally planned a/ economies of Europe	3.8	3.9	3.0	3.2	2 915	4 532
China a/	7.8	6.6	6.6	5.5	346	797
Developing countries	3.3	4.1	0.9	2.0	971	1 233
North Africa	4.8	4.6	2.2	2.4	1 468	2 078
Sub-Saharan Africa	3.2	3.3	0.0	0.0	483	483
Western Hemisphere	2.0	3.2	0.1	1.0	2 129	2 362
West Asia	4.4	4.3	1.1	1.3	3 431	4 129
South and South-East Asia	4.3	4.1	2.4	2.4	454	644
Mediterranean	2.9	2.8	1.2	1.4	2 037	2 487

Source: Department of International Economic and Social Affairs of the United Nations Secretariat.

a/ Based on net material product.

4. World distribution of income

34. Although the process of world development extends beyond rapid economic growth and structural transformation in the developing countries, swift progress in raising their labour productivity and per capita income levels is an essential prerequisite for their full economic and social development. As is well known, the alleviation of poverty, greater employment opportunities, good nutrition and health and better living conditions, all contribute to increasing the level of productivity of the labour force. Furthermore, many aspects of the income distribution process, such as the allocation of world income over countries, the proportion of income received by different income groups within any one national economy, and the division of income among factors of production, are affected by changing production technologies and changes in final expenditure patterns and the pattern of trade.

35. As can be seen in table 5 the extent of inequality, whether measured as output produced per economically active person engaged in production or as output per person in the population, has worsened historically and is likely to become significantly more unequal under the assumptions of the baseline scenario. Measured in constant 1980 prices and exchange rates, income ratios between the developed and developing areas of the world have worsened significantly during the last 15 years and under baseline conditions may be expected to continue to do so. The relative income gap between the developed market economies and the developing countries, which was 10 to 1 in 1970, became 10.9 to 1 by 1985 and may be expected to exceed 11 to 1 by the year 2000. A similar increase in the difference in relative income between the developed market economies and developing countries occurs when measured for all main income groups of developing countries. The deterioration in the relative incomes of the least developed countries, both historically and projected, is particularly marked, reflecting not only differences between the poorest and richest areas of the world, but also the widening disparities between the richer and poorer groups of developing countries.

36. The reason for the increased inequality in the global distribution of income lies, of course, in the differences in growth rates per person among the different regions of the world. In spite of the fact that over the last 25 years GDP growth in the developing countries has exceeded that of the developed market economies, the relative per capita income gap - not to mention the absolute gap measured in dollar terms - between the two groups has widened. Indeed, the difference in relative incomes between some of the more rapidly growing groups of developing countries and the developed market economies improved somewhat in terms of their productivity and income levels, but the difference in relative income between the poorer developing countries and all other groups increased over the last two decades. Hence, not only is the absolute level of productivity and income lower in the least developed and low-income countries, but it tends to increase at a slower pace over time, further increasing the inequality in the distribution of world income.

37. Even those averages do not fully reflect the widespread incidence of poverty. Using estimates of the size distribution of income in countries accounting for 83 per cent of the population of the developing countries, over 1 billion people would have per capita income less than $300 per year (in 1980 dollars) by the year 2000 (see table 6). In 1985, this income group represented about one quarter of

Table 5. Absolute and relative productivity and per capita income 1970-2000 a/

Country group	Gross domestic product per active person	Relative productivity b/	Gross domestic product per capita	Relative per capita b/
Developed market economies				
Historical for 1970	17 163	1	7 439	1
1985	21 754	1	10 024	1
Forecasted for 1990	23 550	1	10 935	1
Projected for 2000	29 006	1	13 429	1
Developing countries				
Historical for 1970	1 988	8.6	746	10.0
1985	2 481	8.8	919	10.9
Forecasted for 1990	2 580	9.1	960	11.4
Projected for 2000	3 080	9.4	1 167	11.5
Major petroleum exporting				
Historical for 1970	51 924	0.3	14 420	0.5
1985	29 223	0.7	8 592	1.2
Forecasted for 1990	23 854	1.0	6 957	1.6
Projected for 2000	27 900	1.0	8 045	1.7
Other petroleum exporting				
Historical for 1970	3 239	5.9	1 127	6.6
1985	3 455	6.3	1 190	8.4
Forecasted for 1990	3 243	7.3	1 125	9.7
Projected for 2000	3 521	8.2	1 251	10.7
Major manufacturing exporters				
Historical for 1970	1 134	15.1	444	16.8
1985	1 967	11.1	762	13.2
Forecasted for 1990	2 322	10.1	908	12.0
Projected for 2000	3 102	9.4	1 247	10.8
Other manufacturing oriented				
Historical for 1970	3 393	5.1	1 186	6.3
1985	3 990	5.5	1 441	7.0
Forecasted for 1990	4 072	5.8	1 493	7.3
Projected for 2000	4 633	6.3	1 773	7.6
Leant developed				
Historical for 1970	523	32.8	213	34.6
1985	573	38.0	217	46.2
Forecasted for 1990	586	40.2	219	49.9
Projected for 2000	609	47.6	225	59.7
Primary commodity and services exporters				
Historical for 1970	1 947	8.8	778	9.6
1985	1 961	11.1	739	13.6
Forecasted for 1990	1 905	12.4	703	15.6
Projected for 2000	1 825	15.9	656	20.5

Source: Department of International Economic and Social Affairs of the United Nations Secretariat.

a/ Measured in 1980 United States dollars per person and percentage ratio to average for developed market economies.

b/ Level in developed market economies as a multiple of corresponding level in groups of developing countries.

Table 6. Number of people with per capita income below $300 a/ in 1985, 1990 and 2000, baseline scenario

Region	1985 b/ Number (millions)	1985 b/ Percentage of sample	1990 Number (millions)	1990 Percentage of sample	2000 Number (millions)	2000 Percentage of sample
Western hemisphere	31	8.5	38	9.3	38	7.6
Africa	176	44.0	211	45.3	2[illegible]3	44.6
Asia	834	60.0	879	56.0	776	42.8
Total	1 041	48.3	1 128	47.0	1 096	37.3

Source: Department of International Economic and Social Affairs of the United Nations Secretariat.

a/ Constant 1980 United States dollars.

b/ Based on the sample populations outlined below:

Region	Number of countries	Sample size, 1985 (millions)	Total population 1985 (millions)	Sample as percentage of total
Western hemisphere	17	365.6	436.8	83.7
Africa	22	399.2	522.5	76.4
Asia	17	1 436.3	1 701.0	84.4
Total	56	2 201.1	2 660.3	82.7

the world's population and in the year 2000 would still be about one fifth. Furthermore, all the improvement comes from the Asian countries, where the trend growth rates of GDP are quite high. For Africa and the western hemisphere, the number of people in this category is actually projected to increase.

5. World trade and external balances

38. The outlook for international trade during the decade of the 1990s, as assessed under the baseline, is less favourable than in any decade since the Second World War. While some degree of policy co-ordination is expected to take place among the major industrial countries, the baseline scenario assumes that a principal concern is to make their economies less vulnerable to competition from abroad. Similarly, in developing countries, strong measures are assumed to be taken to deal with a heavy debt burden leading to greater efforts to increase exports in some cases. But less favourable external environments may cause other countries to seek to limit imports by adopting more inward-orienting growth strategies over time. Under baseline scenario assumptions, therefore, world trade would grow at slightly less than 4 per cent, a modest figure by historical standards. An exception to this general picture is the likely increase of trade in energy products, for reasons explained in section IV.

39. With regard to imports in the developed market economies, competition from abroad is seen as a potential source of income loss and labour displacement, as well as a main cause of imbalance in the external accounts. Consequently, the thrust of domestic policy in some countries is to limit import absorption and, in others, to rely on domestic demand rather than exports as the main source of growth. For this reason, the projected expansion of trade for these countries under the baseline implies a significant reduction in the elasticity of exports and imports with respect to the projected growth in their domestic economic activity (see table 7). In developing countries, efforts are initially directed at restoring external balance by limiting the growth of import demand while attempting to ensure that exports increase faster than imports, 5/ but a more rapid pace of import absorption by most groups of developing countries is foreseen in the latter 1990s. Under these assumptions, external deficits in both groups of countries are reduced over the course of the 1990s as balance-of-payments positions slowly improve. However, economic growth and welfare enhancement stemming from specialization in production and diversification in consumption remain less than they would be under a set of more expansive policies. Moreover, these policies may be expected to contribute to a slower pace of capital formation, and persistently low prices for primary commodities. 6/

40. With regard to exports, slower growth in world import demand necessarily implies dampened export possibilities. Despite the weak outlook for trade, the baseline scenario assumes that world exports will continue to increase at a more rapid rate than GDP. Considerable changes are envisioned, however, in the source of world exports, with a relative slowdown in the rate of increase of exports from the developed market economies and a relative increase in that of the developing countries. These projections may, however, underestimate the growth of trade in Western Europe arising from the decision to create a unified internal market by 1992. In part, this shift is caused by an adjustment designed to ease the debt

Table 7. Growth of world import demand and export possibilities: historical and projected under a baseline scenario a/

Period	Average annual rate of growth: Exports	Imports	Gross domestic product	Average annual rate of growth: Exports	Imports	Gross domestic product
World				Petroleum-exporting countries		
Historical						
1971-1980	5.5	6.0	3.7	1.2	16.2	4.9
1981-1985	3.6	3.9	2.3	-4.0	-0.3	0.5
Preliminary and forecast						
1986-1990	4.0	3.9	2.8	3.5	2.1	1.3
Projected						
1991-2000	3.9	3.8	3.3	4.0	4.6	3.7
Developed market economies				Major exporters of manufactures		
Historical						
1971-1980	6.0	4.8	3.2	10.3	8.9	7.0
1981-1985	3.8	4.1	2.1	7.1	2.7	3.8
Preliminary and forecast						
1986-1990	3.9	3.7	2.4	5.1	5.6	4.9
Projected						
1991-2000	3.8	3.2	2.7	4.7	5.2	4.8
Centrally planned economies of Europe b/				Highly-indebted countries		
Historical						
1971-1980	7.8	8.2	5.1	2.1	7.0	4.9
1981-1985	6.6	7.8	3.5	1.9	-9.9	0.2
Preliminary and forecast						
1986-1990	4.2	4.7	3.8	3.4	2.8	2.2
Projected						
1991-2000	4.3	4.8	3.9	3.5	4.1	3.2
Developing countries				Least developed countries		
Historical						
1971-1980	3.5	10.2	5.2	1.7	5.1	3.6
1981-1985	0.9	0.5	1.8	9.6	7.9	2.0
Preliminary and forecast						
1986-1990	4.2	4.1	3.3	3.3	4.0	3.1
Projected						
1991-2000	4.1	4.8	4.1	3.4	3.8	3.1
China b/				Primary commodity and services exporters		
Historical						
1971-1980	15.4	17.8	6.0	1.3	3.4	2.8
1981-1985	22.2	30.8	8.3	1.9	-2.0	1.2
Preliminary and forecast						
1986-1990	5.1	8.8	7.8	3.0	2.6	2.3
Projected						
1991-2000	5.2	7.4	6.6	3.0	2.7	2.4

Source: Department of International Economic and Social Affairs of the United Nations Secretariat.

a/ Average annual rates of growth and percentage shares in gross domestic product measured in 1980 prices and exchange rates.

b/ Based on net material product.

/...

burden of heavily indebted developing countries. In part, it is also in recognition of the fact that the extraordinary pace of export growth of the group of major developing country exporters of manufactures cannot be sustained at past rates over the long time period reviewed here.

41. External and internal balances shown in tables 2 and 8 have been measured in constant 1980 prices, and consequently do not take into account large-scale changes that have occurred in relative prices before and after that year. Were these balances to be measured in nominal terms, their magnitude and perhaps even their sign would be different; indeed, real external balances shown in table 8 for 1985 for some groups of developing countries, notably, the highly indebted countries, differ significantly from the nominal balance computed at current relative prices. When the projections of world trade were being prepared it was assumed that there would be no further changes in the terms of trade - that is, future movements in export prices would be the same as import prices. Under these circumstances, movements in the real balances projected here would be indicative of the direction and movement in nominal balances that might prevail under the baseline.

Table 8. Degree of world trade orientation and external balances: historical and projected under a baseline scenario a/

Year	Percentage share in GDP			Percentage share in GDP		
	Exports	Imports	External balance	Exports	Imports	External balance
World				Petroleum-exporting countries		
Historical						
1970	17.6	17.0	0.1	49.9	9.6	33.9
1985	22.3	22.9	-0.9	27.1	24.3	0.4
Preliminary and forecast						
1990	23.3	23.3	-0.4	40.7	23.2	15.7
Projected						
2000	24.8	24.4	-0.1	41.7	25.5	14.5
Developed market economies				Major exporters of manufactures		
Historical						
1970	15.3	17.8	-2.3	15.5	20.5	-5.3
1985	22.0	22.9	-0.7	25.3	24.2	0.4
Preliminary and forecast						
1990	23.1	23.9	-1.0	25.1	26.8	-2.7
Projected						
2000	25.6	25.0	0.3	24.6	27.7	-4.1
Centrally planned economies of Europe b/				Highly-indebted countries		
Historical						
1970	14.7	13.5	1.2	18.6	12.1	3.1
1985	20.3	21.1	-0.8	16.6	10.9	3.3
Preliminary and forecast						
1990	20.4	18.7	1.7	18.6	13.8	2.1
Projected						
2000	21.2	19.8	1.4	19.1	15.0	1.4
Developing countries				Least developed countries		
Historical						
1970	31.4	16.1	11.3	13.3	20.8	-7.6
1985	25.7	23.8	0.0	16.6	28.7	-11.7
Preliminary and forecast						
1990	28.8	25.1	2.0	14.4	25.7	-11.0
Projected						
2000	28.7	26.8	0.4	14.8	27.3	-12.0
China b/				Primary commodity and services exporters		
Historical						
1970	2.9	3.0	-0.1	37.5	35.6	-1.3
1985	14.3	24.1	-9.8	33.6	31.1	-1.0
Preliminary and forecast						
1990	7.7	14.2	-6.6	39.3	33.7	+1.3
Projected						
2000	6.8	16.4	-9.6	42.0	34.7	3.1

Source: Department of International Economic and Social Affairs of the United Nations Secretariat.

a/ Percentage shares in gross domestic product measured in 1980 prices and exchange rates.

b/ Based on net material product.

B. Alternative scenarios

42. Some of the premises of the baseline scenario may be modified by policy changes. These may be grouped into three different categories:

(a) Accelerated structural change in the developed market economies may ensue from the widespread concern with productivity including more efficient use of energy, from the effort to create a European internal market by 1992, and from the implementation of the agreement for free trade between the United States and Canada. This might be estimated to raise GDP growth rates by one half of a percentage point or somewhat more;

(b) Improved co-ordination of macro-economic policies among major developed market economies could result in lower world real interest rates, and new arrangements for the channelling of surplus savings towards developing countries could substantially enhance the import and investment capacity of developing countries. The lowering of protectionist barriers against new and competitive producers would also be an essential boost to growth in the world economy;

(c) Developing countries have a large agenda for improvement of their own economic performance and also have much to gain from reducing trade barriers among themselves.

43. When those things are taken into account, the baseline scenario of 4 per cent GDP growth for the developing countries for the rest of the century can be modified. In the more favourable circumstances, the baseline scenario, which holds out little hope for the most disadvantaged parts of the world economy, could be modified quite substantially. Instead of a rate of growth of GDP for developing countries of 4 per cent, one might count on as much as 5 to 6 per cent, which would be enough to make a significant dent in world poverty.

44. In the 1980s, the growth of the world economy has been too uneven. The gaps between rich and poor countries have on the whole deepened, and the prospects for the 1990s seem to be balanced on a knife's edge. Present trends point to the worsening of absolute and relative disparities, but relatively minor changes in policies throughout the world could produce significant improvement.

45. In analysing the sensitivity of the baseline scenario to changes in policy assumptions, the Secretariat made use of three global models: global econometric model (GEM) 7/ and systems for interlinked global modelling and analysis (SIGMA), 8/ developed and maintained by the Department of International Economic and Social Affairs and the United Nations Conference on Trade and Development (UNCTAD), respectively, and future of global interdependence (FUGI), 9/ developed and maintained by Professor Akira Onishi and associates at Soka University, Japan.

46. These models differ significantly, inter alia, in terms of the numbers of regions or countries identified separately, the types of production functions used, the level of sectoral detail, the extent to which money, prices and exchange rates are incorporated and the level of detail included on external transactions. None the less, much of the economic logic underlying the models' specifications is similar, especially in the modelling of the developing countries. Production in

developing countries is heavily dependent on fixed capital formation, but may also depend on labour force (SIGMA, FUGI), import of intermediate goods (SIGMA), or cumulative government expenditures on education (FUGI). Each model incorporates import capacity as a constraining influence in one form or another: directly in the aggregate full-capacity production function (SIGMA), in the investment equation (FUGI), or indirectly, as a determinant of the trade gap (GEM). Ultimately, import capacity depends upon real exports, the commodity terms of trade, and the composition and terms of capital flows (FUGI, SIGMA). In all three modelling systems, the exports of developing countries are determined by the import elasticities and GDP growth rates of partner countries (dominated by developed market economies), based on shares computed from trade matrices.

47. As this sketchy description implies, several different types of policy simulations can be implemented with any of these models. However, the degree of sophistication of the proxies for policy instruments varies quite considerably among models, as does the strength of the transmission effects from one country or group of countries to others.

48. None the less, as table 9 shows, experiments with these three models produced results suggesting a significant impact on GDP growth in developing countries of feasible improvements in policies for international economic co-operation, but only if several of them were to be implemented simultaneously.

49. In scenario A, the efficiency of capital in developing countries, as measured by the incremental capital/output ratio was reduced by 10 per cent. This was accomplished in the GEM model by changing only the incremental capital-output ratios in developing countries which exhibited values greater than the world median of 4.5. The effect on GDP shown in the table may, however, be overstated, since higher GDP growth would normally lead to higher imports requiring either greater exports or larger capital inflows.

50. In scenario B, it was assumed that growth in the developed market economies could be accelerated by 0.5 per cent per year (i.e., from 2.7 per cent per annum in the baseline to 3.2 per cent). This acceleration might be brought about by greater policy co-ordination, leading to more emphasis on expanding demand in surplus developed market economies, rather than by demand contraction in deficit countries, by greater efficiency in energy use, or by higher investment rates in response to further trade liberalisation within the European Economic Community (EEC), the trade agreement between the United States of America and Canada, or in the context of the Uruguay round of the General Agreement on Tariffs and Trade (GATT). Its impact on developing countries would come about by increased import demand on the assumption of no loss in developing country shares in the imports of developed market economies.

51. In scenario C, further improvement in the trade shares of developing countries is assumed to allow their exports to increase by about 0.5 per cent more per year than would otherwise be the case (GEM) or by increasing trade shares in the imports of purchaser countries by 1 per cent (SIGMA) or by a 5 per cent reduction of tariff on manufacturing goods (FUGI). The scenario also assumes no deterioration in the terms of trade and should therefore be assumed to take place mainly in manufactured exports.

Table 9. Additional average annual growth in the GDP of developing countries associated with different policy initiatives, 1990-2000

	Scenarios	Global econometric model	System for interlinked global modelling and analysis	Future of global interdependence
A.	Improved capital efficiency in developing countries	0.6		
B.	Accelerated growth in developed market economies	0.4	0.3	
C.	Increased trade shares of developing countries	0.3	0.4	0.3
D.	Improved savings performance in developing countries			0.3
E.1	Increased official development assistance ODA (selected donors)			0.5
E.2	Increased ODA (all donors)		0.3	
E.3	Increased ODA and other financial flows	0.4		
F.	Reduced interest rates		0.1	

52. Scenario D assumes a 10 per cent increase of investment by developing countries through increased mobilisation of their domestic saving.

53. Scenarios E.1, E.2 and E.3 are each concerned with increasing capital flows. The first includes an increase of capital flows from Japan by $30 billion, one half of which would be on highly concessional terms (ODA) and the other half on commercial terms, full funding of the World Bank's recently agreed capital increase leading to an additional $75 billion of lending, an increase of $6 billion in the structural adjustment facility of the International Monetary Fund (IMF) and a doubling of its compensatory finance facility. Scenario E.2 is less explicit, but

involves somewhat larger flows by assuring a doubling of ODA to 0.70 per cent of the GDP of the developed market economies. The third scenario, E.3, assumes still greater capital flows, or the equivalent in debt relief, such that total capital flows from developed countries would reach about 1 per cent of their own GDP.

54. Scenario F shows the effect of a 2 per cent point reduction in international interest rates, as represented by the London inter-bank offer rate. The impact on the GDP growth of developing countries in the aggregate is small because the effect of lower interest rates would be felt primarily by those developing countries with large debts contracted at floating interest rates. For those countries, the effect would be to increase GDP growth by about 0.3 per cent per year. This still underestimates the effect of lower interest rates, since the impact is assumed by the nature of the model used to be confined to the debt service on the external debt of developing countries. Lower real interest rates could, of course, be expected to accelerate growth in all regions of the world, beginning with the developed market economies, and would probably be a necessary ingredient in the acceleration of GDP growth in the developed market economies (scenario B).

55. Finally, although not simulated in the models described, an improvement in energy efficiency in developing countries, along the lines described in section V below, would be an important means of accomplishing part of the increase in the efficiency of investment simulated in scenario A and part of the reduced trade deficit (through a reduction in the import coefficient), which would be the counterpart of the improved saving performance simulated in scenario D.

IV. DEMOGRAPHIC AND LABOUR FORCE TRENDS AND ISSUES

56. Demographic trends are fairly predictable and provide a good basis for the analysis of structural change and the associated policy issues of the next decade. Against a background of generally slower population growth, which will result in a world population of 6 billion just before the turn of the century, there will be considerable regional diversity. The fastest growth (an annual rate of 3 per cent) will occur in Africa, where the task of economic recovery and restoration of self-sustained growth will be particularly difficult. There will, however, be less dispersion in labour force growth rates in the developing world, which will average 2.5 to 3 per cent. In contrast, labour force growth rates in developed countries will be less than 1 per cent. Employment is likely to grow more slowly than the labour force in most countries, and unemployment will be a concern for all groups of countries.

57. For the world as a whole, the dependency ratio is expected to fall, but this is the result of opposing trends in major world regions. In the developing countries, the total dependency ratio is expected to fall as fertility declines, whereas in the developed countries it is expected to rise, mainly as a result of the increase in the elderly population, which will raise the level of the real and financial resources needed for their care.

58. Urban population will continue to grow faster than rural population in all world regions, due principally to rural-urban migration, and the number and size of "megacities" is expected to increase rapidly in developing countries.

59. Finally, the pressure for international migration is expected to accelerate in the 1990s as income differentials increase and the cost of transportation declines relative to incomes.

A. Population trends and structure

1. New growth trends

60. The world's population surpassed 5 billion in the middle of 1987 and is projected to grow to 6 billion just before the turn of the century. In the previous 13 years, it grew from 4 to 5 billion. The quarter century from 1975 to 2000 will have witnessed the greatest absolute expansion of the global population in such a short time. The annual rate of population growth fell to 1.7 per cent in the period from 1980 to 1985, from the peak rate of 2.0 per cent in the period from 1965 to 1970, and is expected to continue to decline slowly in the future. However, a significant decline in the size of the net annual increments to the world total will be seen only in the next century. 10/

61. In the 1960s, there was a clear dichotomy between rapid growth of populations in the developing regions (the average annual rate was about 2.5 per cent) and slow growth in the developed countries (the average annual rate was 1.1 per cent), and little diversity among the major developing regions, ranging from 2.4 per cent in Asia (excluding Japan) to 2.7 per cent in Latin America (see table 10). Since the 1960s, however, the rates of population increase have become more diverse among developing regions and their constituent countries and the divergence is expected to increase in the 1990s. Population growth in Africa began to accelerate in the 1950s and continued to do so through the 1980s, while in other major developing regions it began to decelerate in the 1970s. The drop in the growth rate was particularly notable in the Asian planned economies (especially China); the drop is expected to continue in the 1990s, reaching a level 50 per cent below that of the 1960s. Presently projected population growth rates for the 1990s are about 3 per cent in Africa and West Asia, 2 per cent in Latin America, 1.7 per cent in the developing countries of South and East Asia, and 1.2 per cent in the Asian planned economies. 11/ The growth rate in the developed countries as a whole has fallen to 0.7 per cent in the 1980s and is projected to be only 0.56 per cent in the 1990s (0.8 per cent or less in North America and Eastern Europe and 0.3 to 0.5 per cent in the European market economies and Japan). These differential growth rates will result in quite different age structures and this, in turn, will affect many aspects of development.

62. The shift in the regional shares of global population is dominated by the growth of developing Africa and West Asia. Their combined share, which was 10 per cent in 1960 and 12 per cent in 1980, is projected to reach 16 per cent in 2000. In contrast, the proportion of world population accounted for by the developed countries declined from 31.4 per cent in 1960 to 25.8 per cent in 1980, and is projected to be only 21.3 per cent in 2000 (see table 11).

Table 10. Total population, in millions, and annual growth rates, 1960-2000

(Percentage)

Country groups	1960	1960-1970	1970	1970-1980	1980	1980-1990	1990	1990-2000	2000
Developing countries									
North Africa	54	2.53	69	2.54	89	2.60	115	2.17	142
Sub-Saharan Africa	208	2.60	268	3.02	361	3.15	493	3.29	681
South and East Asia	796	2.40	1 009	2.27	1 263	2.01	1 541	1.70	1 823
West Asia	46	3.23	63	3.36	87	3.26	121	2.92	161
Mediterranean	47	1.92	57	1.82	68	1.62	80	1.43	92
Western hemisphere	216	2.72	282	2.46	360	2.25	450	1.94	545
Subtotal, developing countries	1 366	2.50	1 748	2.46	2 228	2.30	2 798	2.10	3 444
China and Asian planned economies	704	2.36	889	1.88	1 070	1.28	1 215	1.18	1 367
Developed market economies	634	1.07	705	0.87	768	0.60	816	0.56	863
Centrally planned economies of Europe	313	1.05	347	0.85	378	0.83	410	0.69	439
World total, 150 countries	3 015	2.04	3 689	1.88	4 444	1.66	5 239	1.55	6 114
Least developed countries	200	2.41	253	2.56	326	2.72	426	2.68	555

Source: Department of International Economic and Social Affairs of the United Nations Secretariat. Based on country data in World Population Prospects - Estimates and Projections as Assessed in 1984, United Nations publication, Sales No. E.86.XIII.3. The projections for 1990 and 2000 are based on the "medium variant" projection for each country.

Table 11. Population as percentage of world total, 1960-2000

Country groups	1960	1970	1980	1990	2000
Developing countries					
North Africa	1.8	1.9	2.0	2.2	2.3
Sub-Saharan Africa	6.9	7.3	8.1	9.4	11.1
South and East Asia	26.4	27.4	28.4	29.4	29.8
West Asia	1.5	1.7	2.0	2.3	2.6
Mediterranean	1.6	1.5	1.5	1.5	1.5
Western hemisphere	7.2	7.6	8.1	8.6	8.9
Subtotal, developing countries	45.3	47.4	50.1	53.4	56.3
China and Asian planned economies	23.3	24.1	24.1	23.2	22.4
Developed market economies	21.0	19.1	17.3	15.6	14.1
Centrally planned economies of Europe	10.4	9.4	8.5	7.8	7.2
World total, 150 countries a/	100.0	100.0	100.0	100.0	100.0
Least developed countries	6.6	6.9	7.3	8.1	9.1

Source: Department of International Economic and Social Affairs of the United Nations Secretariat, based on table 10.

a/ Totals may not add to 100 per cent because of rounding.

63. In the least developed countries, 12/ population growth has accelerated, from an average rate of 2.4 per cent in the 1960s to 2.7 per cent in the 1980s, compared with a deceleration in the developing countries as a whole, from 2.5 per cent in the 1960s to 2.3 per cent in the 1980s, and a dramatic drop in the Asian planned economies (especially China), from 2.4 per cent to 1.3 per cent. The difference is expected to be even greater in the 1990s - 2.7 per cent in the least developed countries versus 2.1 per cent in the developing countries as a whole, and only 1.2 per cent in China and the Asian planned economies.

2. Mortality and life expectancy

64. Population growth rates are affected by trends in mortality and fertility. Mortality has declined in most countries during recent decades, but unevenly. Though it remains high in most developing countries, the mortality rate has declined very rapidly in some and has reached levels as low, or nearly as low, as those in developed countries. In the past decade, there have been decreases in infant mortality rates in nearly 150 countries, but more than one quarter, representing 29 per cent of world population, still have rates above 10 per 1,000 live births. Between 1985 and 1990, the average in the least deve oped countries is estimated at 124 per 1,000, and in Africa as a whole, it is 101, while the average in the developed countries is about 14 (18 including South Africa).

65. Mortality levels and trends are influenced by many social, economic and cultural factors, including policies and programmes outside the health sector. Economic development is usually associated with mortality decline, since improved economic conditions imply higher living standards and increased financial resources for health services. But low mortality levels have also been achieved in some poor societies where Governments are committed to reducing mortality; China, Costa Rica, Cuba, Sri Lanka and the state of Kerala in India are well-known examples.

66. In developing countries, deaths of young children constitute a large share of all deaths, and children are considered the major target in efforts to reduce overall mortality. The factors having the greatest effect on the mortality of children are those related to parental education, especially that of mothers. Analysis of data from the World Fertility Surveys show that infant and child mortality generally decreases as the average number of years of education of the mother increases. 13/ Survey results suggest that the impact of parental education may be greater than that of income-related factors and access to health facilities combined. 14/

67. One of the most important findings from the World Fertility Surveys concerns the exceptionally high mortality rates among children born after a short birth interval. 15/ This suggests that family planning programmes aimed at spacing births and avoiding high-risk pregnancies could help to reduce infant, child and also maternal mortality. Other interventions that can lower mortality in developing countries include efforts to improve the nutritional level of the population, immunization programmes and other health measures, some of which are discussed in section VI below.

68. The mortality assumptions underlying the population projections shown in table 10 are given in the form of life expectancy at birth, and age and sex patterns of survival probabilities. In general, mortality trends followed the assumption of a quinquennial gain of 2.5 years in the expectation of life at birth until life expectancy reaches 62.5 years, followed by a slow-down in the gain thereafter. However, for some developing countries for which recent evidence has indicated a retardation or an acceleration in the improvement of mortality levels, the assumed future quinquennial gains were adjusted accordingly. For example, the anticipated quinquennial gain in life expectancy was lowered from 2.5 years to two years or less for some sub-Saharan African countries. For those countries in which

life expectancy at birth has already reached a high level, the maximum level of expectancy at birth was assumed to be 75 years for males and 82.5 years for females. 16/

69. In the developed countries, life expectancy at birth has increased from 66 years in the early 1950s to 73 years in the early 1980s, while in the developing countries as a whole, it has increased from 41 to 57. The largest regional increase was in East Asia, reflecting a dramatic increase in China from 41 years in the early 1950s to 68 in the early 1980s; in Africa, it increased from 35 years to 49. The average life expectancy in the least developed countries in the period from 1985 to 1990 is estimated as about 48 years, which is even below the estimate of 49.5 for sub-Saharan Africa. The low life expectancy and high infant mortality rate reflect the unfavourable living conditions in the least developed countries and imply that their population may increase even more rapidly in the future if mortality conditions improve and fertility remains unchanged.

70. Life expectancy at birth is generally several years longer for women than for men, especially in the developed countries: 76 years for women versus 68 years for men in the early 1980s; in the developing countries, it was 58 years for women and 56 years for men. The region where expectancy for women was an average about the same as for men in the early 1980s is South Asia, although improvements in female life expectancy in Sri Lanka in the past two decades have resulted in a more normal pattern in that country (see table 12). The larger differential in the developed countries reflects their lower maternal mortality rates. By the year 2000, the difference is projected to increase to three years in the developing countries as a whole, and to remain constant in the developed countries.

Table 12. Life expectancy at birth, number of years, 1970-2000 a/

Country group	Number of countries	Male				Female			
		1970-1975	1980-1985	1990-1995	2000-2005	1970-1975	1980-1985	1990-1995	2000-2005
Developed market economies	25	67.3	69.4	70.6	71.6	73.6	75.9	77.1	78.0
Centrally planned economies of Europe	8	66.0	66.9	69.1	70.9	73.9	75.1	77.2	78.7
Developing countries									
North Africa	5	51.6	57.4	62.3	66.1	54.1	60.2	65.3	69.9
Sub-Saharan Africa	44	42.4	45.8	49.9	53.9	45.5	49.0	55.3	57.3
South and East Asia	19	50.2	54.3	58.3	62.3	49.7	54.7	59.3	63.7
South Asia	7	49.8	53.6	57.6	61.5	48.1	53.0	57.7	62.2
East Asia newly-industrialized countries	3	60.1	65.5	68.3	70.2	65.0	71.8	74.4	76.5
Others	9	50.3	55.2	59.6	63.8	53.0	58.4	62.9	67.2
West Asia	13	54.5	58.0	62.1	65.7	55.6	59.8	64.5	68.9
Mediterranean	4	58.1	61.8	65.2	68.0	62.0	65.5	69.7	73.1
Western hemisphere	28	58.6	61.8	64.5	66.7	63.0	66.6	69.6	72.0
Subtotal, developing countries	113	50.4	53.9	57.4	60.6	51.5	55.8	59.8	63.4
China and Asian planned economies	4	61.6	65.8	68.3	70.2	63.3	68.3	72.0	74.6
World total, 150 countries	150	55.6	58.2	61.0	63.6	57.7	61.0	64.3	67.2
Least developed countries	34	42.9	45.6	49.3	53.2	44.3	47.3	51.2	55.3

Source: Department of International Economic and Social Affairs of the United Nations Secretariat, based on five-year averages for individual countries in World Population Prospects - Estimates and Projections as Assessed in 1984 (United Nations publication, Sales No. E.86.XIII.3, annex II), and supplementary data bank.

a/ Country group averages are calculated from individual country life expectancies weighted by number of births.

3. Factors affecting fertility trends

71. In the 1950s and 1960s, the level of fertility provided a generally reliable means of distinguishing the developed from the developing countries, but in the last two or three decades, the distribution has become less prominently bimodal. With substantial fertility declines in a number of developing countries of Latin America and Asia and persisting high fertility in most of Africa and West Asia, the fertility differentials currently observed within the developing world are now as wide as those formerly found between the developing and the developed countries. 17/

72. The most rapid fertility declines have occurred in developing countries with a combination of profound improvements in child survival, increases in educational levels and strong family planning programmes. Since the early 1960s, total fertility rates have declined by 2 to 3 children per woman in China, the Republic of Korea, Thailand, Malaysia, Sri Lanka, Brazil, Mexico, and Colombia. In all these countries, the proportion of married women of childbearing age currently using contraception grew rapidly since at least the mid-1960s, gaining 2 to 3 percentage points a year and, in the 1980s, reached levels of 50 to 70 per cent. Simultaneously, infant and child mortality rates declined in China from 240 per thousand to 55, and from a range of 120 to 190 per thousand in the other seven countries, to a range of 40 to 90. Gross enrolment ratios of females for the second level of education rose from less than 15 per cent in all these countries to between 30 and 35 per cent in Thailand, Brazil and China, about 50 per cent in Sri Lanka, Malaysia, Mexico and Colombia and 90 per cent in the Republic of Korea.

73. Conversely, low rates of child survival, low levels of education and insufficient access to birth control methods impede the transformation to lower fertility in most countries of sub-Saharan Africa, as well as in such Asian countries as Pakistan, Bangladesh, Nepal and Afghanistan. In these countries, total fertility rates average 6 or 7 children per woman and show few signs of decline. 18/ Infant and child mortality rates are still well above 150 per 100 in most of them and often exceed 250; the female gross enrolment ratio for the second level of education and the proportion of married women currently using contraception are typically below 10 per cent and rarely above 20 per cent.

74. Recent studies confirm the strong negative relationship between development and fertility but they also show that, within groups of countries at similar levels of development, fertility decline has been greatest in those countries with the most aggressive family planning programmes. 19/ Without deliberate government fertility intervention, the diffusion of development is likely to induce fertility decline first among the more economically advanced population groups; at a later stage, declines are observed across all groups. (Variations among countries at similar levels of development are also likely to be related to differences between social settings in household organization and institutional arrangements for the rearing of children.)

75. Improvements in child survival increase the predictability of the family's life cycle and thus create an appropriate environment for the adoption of family planning practices. 20/ The "insurance effect" operates at a later point in the demographic transition when family size desires are clearly formulated. Since, in

many countries, family planning methods other than sterilisation are not yet widely accessible, there still is considerable potential for large reductions in fertility. 21/

76. Education may affect fertility through acquired skills and knowledge, including the ability to provide safe child care and to use contraception effectively. Advanced education usually delays marriage and thus reduces the length of the childbearing lifespan. In the developing countries, women with seven or more years of schooling marry, on average, nearly four years later than women with no education. Education may also convey the influence of residence, income or socio-economic status, or be jointly determined with variables of this type. In addition, women's education is often positively associated with the opportunity costs of childbearing.

77. Although fertility decline due to education tends to be quite large in relatively advanced developing countries, in the least developed countries, women with just a few years of education bear more children than those with no education. This may be due to the effect of reduced breast-feeding on the part of the more educated women, which outweighs the effect of possible initial efforts by those women to use contraception.

78. Although fertility decline may be assisted by changes in marriage patterns or by maintenance of lengthy breast-feeding, efficient practice of birth control is essential to achieve and sustain low levels of reproduction. Most of the inter-country variation in current national fertility levels is explained by differences in contraceptive use. Though contraceptive use varies according to the level of development, population policies have a strong independent effect, as seen in the high levels of contraceptive use achieved by some poor countries with strong family planning programmes.

79. In preparing the population projections shown in table 10, past and current fertility trends for each country are evaluated and placed within the social, economic and political context of each country. Trends and anticipated changes in the socio-economic structure and cultural values of the society, as well as policies and programmes directed towards family planning are considered vis-à-vis expected trends in fertility. For many low-fertility countries, fertility levels are assumed to decline or to remain below replacement level until about the end of the century, after which they are expected to be close to replacement level. For high-fertility and moderate-fertility countries, the level is expected to decline as countries advance in their social and economic development, which is generally assumed to progress as time passes. It is also assumed, for those countries, that existing or anticipated governmental policies and programmes for family planning and related-governmental activities would accelerate or expedite the process of fertility decline. Once the decline in fertility starts, it is expected to begin slowly, gain momentum and then slow down. 22/

4. Changing population structure

80. The population age structure and the pattern of changes in it differ greatly among major regions of the world. Children under the age of 15 formed 22 per cent of total population in the developed regions in 1985 and 37 per cent in the developing regions - 47 per cent in Africa. The elderly population (aged 60 years and older) comprised 16 per cent of the total population of the developed regions but only 7 per cent in the developing regions - 4 per cent in Africa. In the middle range of the age distribution, the developed regions had a relatively small proportion (16 per cent) of youth aged 15 to 24, and a relatively large proportion aged 25 to 59 (46 per cent), while in the developing regions, youth comprised 21 per cent of the total population, and those in the 25 to 59-year-old group, only 36 per cent of the total.

81. Changes in fertility and mortality in the past 40 years have introduced bulges and troughs in the age structure, with predictable time lags. Especially noteworthy are the baby booms that occurred shortly after the Second World War in many developed countries and the drop of fertility rates with varying speed and timing among many developed countries in the past 30 years. Significant reductions of infant and child mortality rates, or increases in fertility rates, resulted in a sharp increase in the child and school-age populations during the 1950s and 1960s, when 40 to 50 per cent of the world's population increase was composed of children under 15 years of age. With a time lag, these inflated population cohorts moved to the youth category. As they reach adulthood, the main working-age population, aged 25 to 59, has begun to increase rapidly in the 1980s and will continue to accelerate in the 1990s.

82. The primary and secondary school-age populations are defined by the United Nations Educational, Scientific and Cultural Organisation (UNESCO) for statistical purposes as children aged 6 to 11 and 12 to 17, respectively. In the developed regions and East Asia, the school-age populations declined in the 1980s as a result of the fertility decline in the 1970s. The reduction of the school-age population in the developed regions was about 0.4 per cent per year, and in East Asia, affected strongly by the sharp decline in Chinese fertility, the school-age population has declined almost 1.85 per cent per year in the 1980s. As a result of the gradual fertility decline in recent years, the school-age populations (6 to 17 years of age) of Latin America and the other developing countries in Asia will increase more slowly in the 1990s than before, i.e., at an annual rate of 1.2 per cent in Latin America, down from 1.5 per cent in the 1980s, and at an annual rate of 0.8 per cent in Asia, down from 1.3 per cent in the 1980s. 23/

5. Aging of populations

83. Recent demographic trends suggest that from 1985 to 2000 the populations of both the developed and the developing regions will grow older, in the sense that the median age and the proportion of elderly (60 and over) will increase. Between 1985 and 2000, the median age in the developed countries is projected to increase by 3.6 years, almost the same as in the developing regions (3.5 years), with the exception of Africa, where it is expected to remain virtually constant. There will

be very large increases in the number of the elderly in all regions, reflecting growth rates considerably greater than the growth rates of the total population. Between 1985 and 2000, the world's elderly population will grow by 2.36 per cent annually, compared with 1.57 per cent annually for the total population. The annual rate of growth of the number of elderly in the developing countries will be about 3 per cent, almost twice as high as in the developed countries. None the less, the share of the elderly in the total population will not increase very much between 1985 and 2000. In the developed countries, it will rise from 16 to 18 per cent and, in the developing countries, from 7 to 8 per cent (in Africa it will remain at 5 per cent). For the world as a whole, it will rise from 9 to 10 per cent.

84. Dependency ratios seek to capture the changes in the relative proportions of the economically active population, which is conventionally defined as the age group between 15 and 64, and those which are younger or older. This is obviously a gross simplification. In many countries, the young contribute to production before the age of 15 and in others, only much later. Similarly, some retire from active economic life before the age of 65 and others, only later. Therefore, minor differences should not be regarded as significant, but major changes will reflect economically important aspects of a changing population structure.

85. For the world as a whole, the old-age dependency ratio (the ratio of those over 65 to those between the age of 15 and 64) will not change much between 1985 and 2000, rising from 10 to 11 per cent (see table 13). This will be more than offset by a 7 per cent decline in the child dependency ratio, and the total dependency ratio is projected to fall from 65 to 59 per cent. This corresponds closely to the overall trend in the developing regions, where the old-age dependency ratio is expected to rise by 1 per cent and the child dependency ratio to fall by 10 per cent, so that the total dependency ratio would fall from 70 to 61 per cent. In the developed regions, however, the old-age dependency ratio is expected to rise by 3 per cent and the child dependency ratio to fall by only 1.4 per cent; thus the total dependency ratio would rise from 51 to 53 per cent.

86. There is little likelihood of the projected changes in age structure being nullified, either by unforeseen events or by policy-induced changes in fertility or mortality patterns. As the twenty-first century approaches, the aging of the world's population is a virtual certainty, and thus provides a firm foundation for long-range planning. Projections for the long period from 1985 to 2020 indicate that, in the more developed regions, the elderly proportion would increase by 6.6 percentage points, of which 5.8 points could be attributed to the initial age structure in 1985. In the less developed regions, the proportion of elderly is projected to increase by 4.3 percentage points by the year 2020, of which 2.4 points are attributable to the initial age structure. 24/

87. Increased life expectancy and lower fertility, which, in the process of modernisation tend to be accompanied by a weakening of the extended family, raise new demands for the support of the older age group. This has, until recently, been an issue primarily in industrialized countries, but is now a world-wide concern that calls for wide attention. Policies of mandatory ages of retirement, which were regarded as socially progressive when work was regarded as painful and

Table 13. Dependency ratios, 1970-2000

(Percentage)

Country group d/	Child dependency ratio a/					Old-age dependency ratio b/					Total dependency ratio c/				
	1970	1980	1985	1990	2000	1970	1980	1985	1990	2000	1970	1980	1985	1990	2000
Developing countries															
North Africa	87.0	79.1	75.5	72.0	59.2	8.1	7.4	7.0	6.7	6.8	95.1	86.6	82.5	78.7	66.0
Sub-Saharan Africa	86.3	89.7	91.0	92.5	93.2	5.2	5.3	5.3	5.4	5.4	91.5	95.0	96.4	97.9	98.7
South and East Asia	76.6	70.6	65.9	60.5	51.1	6.2	6.6	6.7	6.9	7.7	82.9	77.2	72.7	67.5	58.8
South Asia	75.5	71.0	67.0	61.9	52.2	6.4	6.8	6.9	7.1	7.8	82.0	77.8	73.9	69.0	60.0
East Asia newly-industrialized countries	74.8	51.7	45.8	43.5	38.4	6.0	6.5	6.8	7.4	9.3	80.9	58.3	52.7	50.9	47.4
Others	80.3	72.5	66.1	59.2	49.8	5.6	6.1	6.2	6.3	7.2	85.9	78.6	72.3	65.6	57.0
West Asia	90.1	86.2	84.0	81.6	73.3	6.2	6.0	5.7	5.6	5.7	96.3	92.2	89.8	87.2	79.1
Mediterranean	61.8	56.4	51.8	48.8	44.8	9.7	10.2	8.9	9.1	11.8	71.6	66.6	60.8	58.0	56.7
Western hemisphere	79.0	69.7	65.7	62.1	54.1	7.2	7.6	7.7	7.9	8.4	86.3	77.4	73.4	70.0	62.6
Subtotal, developing countries	78.8	73.8	70.3	66.6	59.7	6.4	6.7	6.7	6.8	7.4	85.2	80.5	77.1	73.5	67.2
China and Asian planned	71.8	60.4	47.2	38.7	36.1	7.7	7.8	8.0	8.4	10.1	79.5	68.3	55.3	47.2	46.3
Developed market	41.3	35.4	32.8	31.7	31.6	16.0	17.9	17.7	18.6	20.2	57.8	53.4	50.5	50.3	51.9
Developed planned	43.1	37.1	37.4	37.7	35.3	13.3	16.1	14.6	15.1	18.6	56.5	53.2	52.0	52.8	53.9
Total developed	42.2	36.0	34.3	33.6	32.8	15.1	17.3	16.7	17.4	19.7	57.4	53.4	51.0	51.1	52.6
World total	65.5	59.7	54.9	51.3	48.0	9.5	10.0	9.7	9.9	10.8	75.0	69.8	64.6	61.2	58.9
Least developed countries	83.3	85.5	84.0	83.4	78.6	5.8	5.9	5.7	5.6	5.6	89.1	91.5	89.8	89.1	84.2

Source: Department of International Economic and Social Affairs of the United Nations Secretariat, based on country data in World Population Prospects - Estimates and Projections as Assessed in 1984, (United Nations publication Sales No. E.86.XIII.3). The projections for 1990 and 2000 are based on the "medium variant" projection for each country.

a/ Population age 0-14 / Population age 15-64.

b/ Population age 65+ / Population age 15-64.

c/ Population age 0-14 and 65+ / Population age 15-64.

d/ Country group averages are weighted by population age 15-64.

retirement could be appropriately financed, have to be rethought in countries where rising wealth standards have prolonged potential working life. In many developing countries, there will be a need to develop social institutions to compensate for the declining role of the extended family. Developed countries face growing tax burdens on the economically active population, competition for resources to provide for the needs of children and the elderly and a need to allocate costs and responsibilities of caring for the elderly between Governments, individuals and families. These challenges may be magnified by declines in the productivity and mobility of the labour force.

6. Labour force - quantitative outlook*

88. The trends in labour force growth are determined by changes in population structure and participation rates. The growth of the labour force in the 1990s is projected to slow significantly in the developed regions and China, but to remain fairly stable in the developing regions. For the world as a whole, the average annual rate of labour force increase will decline dramatically to 1.5 per cent during the period from 1990 to 2000, compared with 2.1 per cent during the period from 1970 to 1980 and 1.9 per cent between 1980 and 1990 (see table 14). The average annual increase will decline slightly from 41 million in the 1980s to 39 million in the 1990s; over 35 million of the increase will occur in the developing countries. Whether or not growth in the demand for labour will be able to absorb this increasing supply will be an important policy question for the 1990s.

89. In 1980, about 58 per cent of the world's population aged 10 and over were members of the labour force (including those without jobs who were looking for employment); overall, the participation rate was 73 per cent among males and 43 per cent among females. The rates varied significantly among regions, especially for females, ranging from about 60 per cent in the centrally planned economies to about 10 per cent in North Africa and West Asia (table 15). The apparent diversity between the high female participation rate in sub-Saharan Africa (51 per cent) and the lower rates in Latin America and South Asia (25 per cent) may reflect cultural differences in the definition of female work.

90. Persons aged 25 to 59 comprised 65 per cent of the world labour force in 1985 and will account for virtually all of the labour force increase in the 1990s. That group is projected to increase in the 1990s at the same rate as in the 1980s - or higher - in most regions, except for Latin America, where the annual growth rate is projected to decline from 3.2 to 2.9 per cent. The projected annual rates of increase for other regions are between 2.7 for the developing countries in Asia and 3.0 per cent for Africa. The increased concentration of the labour force in the group will tend to increase overall labour productivity, as this group is more experienced, on average, than the labour force under 25 years of age.

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* Selected qualitative aspects of labour force participation by several social groups are discussed in section VI.C.

Table 14. Total labour force, in millions, and annual growth rates, in percentages, 1970-2000

	1970	1970-1980	1980	1980-1990	1990	1990-2000	2000
Developing countries							
North Africa	18.0	2.79	23.7	3.02	31.9	3.01	42.9
Sub-Saharan Africa	121.1	2.55	155.8	2.44	198.2	2.70	258.7
South and East Asia	390.8	1.99	475.9	2.19	591.0	1.99	719.6
South Asia	277.8	1.82	332.8	2.14	411.1	2.00	501.1
East Asia newly-industrialized countries	13.8	2.92	18.4	2 30	23.1	1.68	27.3
Others	99.2	2.31	124.7	2.32	156.8	2.00	191.2
West Asia	17.3	3.54	24.5	3.48	34.5	3.44	48.4
Mediterranean	25.6	1.43	29.5	1.72	35.0	1.57	40.9
Western hemisphere	90.4	3.12	122.9	2.52	157.6	2.37	199.1
Subtotal, developing countries	663.3	2.30	832.3	2.33	1 048.1	2.25	1 309.6
China and Asian planned economies	455.1	2.47	580.6	2.24	724.3	1.23	818.4
Developed market economies	304.4	1.34	347.9	0.91	380.9	0.52	401.3
Centrally planned economies of Europe	172.4	1.21	194.5	0.65	207.6	0.58	219.9
World total, 150 countries	1 595.2	2.06	1 955.3	1.90	2 360.9	1.53	2 749.3
Least developed countries	103.9	2.09	127.8	2.39	161.9	2.54	208.1

Source: Department of International Economic and Social Affairs of the United Nations Secretariat, based on country population data in World Population Prospects - Estimates and Projections as Assessed in 1984, (United Nations publication, Sales No. E.86.XIII.3), and labour force participation rates from the International Labour Organisation (ILO), Economically Active Population, 1950-2025, Geneva, 1986. The projections for 1990 and 2000 are based on the "medium variant" population projection for each country.

Table 15. Labour force participation rates, a/ male and female, 1960-2000

(Percentage)

	1960		1970		1980		1990		2000	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Developing countries										
North Africa	77	6	70	7	67	9	67	11	67	12
Sub-Saharan Africa	82	57	81	54	79	51	76	46	74	42
South and East Asia	83	34	79	32	76	29	75	27	75	26
South Asia	85	32	80	28	77	25	76	22	76	21
East Asia newly-industrialised countries	73	26	68	32	67	35	71	36	71	37
Others	80	41	75	42	72	41	72	39	73	38
West Asia	79	7	74	9	71	12	70	14	68	16
Mediterranean	80	51	75	45	73	40	72	39	71	40
Western hemisphere	77	18	72	20	69	25	69	25	68	26
Subtotal, developing countries	82	34	77	32	74	31	74	29	73	28
China and Asian planned economies	87	60	84	61	80	61	82	63	81	63
Developed market economies	77	36	69	36	66	41	67	42	67	41
Centrally planned economies of Europe	59	56	63	60	64	60	64	58	62	56
World total, 150 countries	79	43	75	42	73	43	74	42	73	40
Least developed countries	86	39	81	38	79	37	78	34	76	32

Source: Department of International Economic and Social Affairs of the United Nations Secretariat, based on country data from ILO, Economically Active Population, 1950-2025, Geneva, 1986.

a/ Labour force divided by population aged 10 and over, weighted by population aged 10 and over.

91. The proportion of the labour force in the 10 to 14 age group is negligible for the developed regions but averages 5 per cent in the developing regions, reaching 7.9 per cent in Africa. This proportion is in sharp decline in every region of the world, except for Africa, and this trend is projected to continue through the 1990s.

92. Decelerating growth of the number of youth (aged 15 to 24) in the labour force will be a new phenomenon in the 1990s in several regions of the world, and there will be absolute declines in some countries. These changes will be caused primarily by declines in the size of the youth population and also by its declining rate of labour force participation. According to the projections made by the International Labour Office 25/ the number of youth in the labour force in East Asia (including Japan and China) will decline at an annual rate of 3 per cent in the 1990s, compared with a positive growth rate of 2.3 per cent in the 1980s. In southern Asia (including West Asia and South-East Asia), the annual growth rate will fall from 2 per cent in the 1980s to 1.1 per cent in the 1990s. In the more developed regions, the youth labour force will decline 0.2 per cent per year in the 1990s, compared with an annual increase of 1.0 per cent in the 1980s. Overall, the total number of youth in the world labour force will grow much more slowly in the 1990s (at an average rate of 0.5 per cent) than the 1.1 per cent rate of the 1980s.

93. The elderly labour force, aged 60 years or older, comprises 5.4 and 5.0 per cent of total labour force in the developed and the developing regions, respectively. Its projected rates of annual increase in the 1990s are relatively modest: 1.2 per cent for Latin America, 1.5 per cent for the developed regions, 1.7 per cent for Asia and 2.1 per cent for Africa.

94. In both developed and developing regions, the percentage of women in the economically active population has increased since 1950; in 1985, women represented 36.5 per cent of the world's labour force. Relatively little change is expected in women's average labour force participation rate in most regions in the 1990s (see table 15). Moderate increases in participation by middle-aged and older women in some regions will be offset by lower participation by younger women, as they spend more years in full-time education. However, the projected trends do not take into account possible policy changes. Some changes with a large potential impact are already visible in 1988: legal equality has been achieved in many countries and more affirmative actions favouring women's participation are being implemented. If it is encouraged by further policy initiatives, women's overall economic participation in the year 2000 may well be greater than currently projected (see related discussion in section VI.C below).

B. Urbanization

1. Urban population

95. In 1985, 41 per cent of the world's population resided in urban areas - 71 per cent in the developed regions, 69 per cent in Latin America and less than 30 per cent in Africa and Asia. 26/ The definition of urban areas differs from one country to another. The smallest areal units that are classified as urban range

between 200 and 30,000. The process of urbanisation, defined as an increase in the proportion of population living in urban areas, is largely a one-way process leading to a concentration in the pattern of population distribution.

96. A cross-sectional analysis shows that during the 1960s and 1970s, the higher the level of urbanisation, the lower the rate of urban population growth. 27/ In the 1970s, for example, the rate of increase in the urban proportion averaged 2.3 per cent per year in those countries where the level of urbanisation (urban proportion) was under 25 per cent. Where the level of urbanisation exceeded 75 per cent, the rate of increase in that proportion decreased to as low as 0.3 per cent.

97. The dynamics of population growth, industrialisation and agricultural modernisation are expected to keep urban population growth rates above the rural growth rates in all regions. The urban population of developed countries is expected to rise from 71 per cent in 1985 to 74 per cent by the year 2000. In Africa, it is expected to increase from 30 to 39 per cent, in Asia (including Japan) from 28 to 35 per cent, and in Latin America, from 69 to 77 per cent. The number and size of "megacities" will increase rapidly in developing countries (as discussed in section V.C, below).

2. Rural population

98. Despite the continuing exodus to the urban areas, the population residing in rural areas still comprises a majority in most developing countries, and approximately one third of the total population increase in the developing countries in the 1990s will occur in rural areas. In the developed countries, the rural population accounted for less than 30 per cent of the total population in 1985, and it is projected that their share in the total population will fall to 26 per cent in the year 2000.

99. The total rural population of the developing countries is expected to increase at an average annual rate of 1.0 per cent during the period from 1990 to 1995 and at 0.8 per cent per year between 1995 and 2000. In Latin America, the growth of the rural population nearly halted after 1980 and the size of its rural population (125 million in 1985) is projected to be practically unchanged through the year 2000. Rural population growth in Africa, however, was 2.2 per cent per year in the period from 1980 to 1985 and in Asia, it was about 1.3 per cent per year. By the year 2000, the rural growth rate is projected to fall slightly in Africa, to about 1.9 per cent, and substantially in Asia, to about 0.4 per cent, due to migration and declining rates of natural increase. Nevertheless, the rural population will still comprise a large majority in these regions: Africa, 61 per cent, East Asia (including Japan), 67 per cent and southern Asia (including South-East and West Asia), 64 per cent.

3. Internal migration

100. Rural-to-urban migration is only one type of population movement within a country. There are movements from urban to rural areas, among urban areas and among rural areas. All types of migration are intimately related to social and economic changes and have significant policy implications. However, it is difficult to assess the situation, due to lack of statistical data.

101. An analysis of data from 57 countries, both developed and developing, indicates that the annual rate of net in-migration in urban areas (the number of in-migrants net of out-migrants divided by the urban population) ranged between 0.9 and 4.6 per cent in the developing countries and between 0.03 and 2.9 per cent among the developed countries. 28/ In Latin American countries and in the developed countries, there is a tendency for female rural-to-urban migrants to outnumber their male counterparts. Male migrants are relatively more numerous in Africa and Asia. Among the 57 countries surveyed, 24 had sex ratios of the migrants (number of males per 100 females) smaller than 80, while migrants in 10 countries had sex ratios over 110. These migrants tend to be young. In the developing countries, around 25 per cent of the migrants were aged 15 to 24 and in the developed countries more than 20 per cent were in that age bracket; in some countries, the proportion was much higher. Another 20 to 40 per cent were children under the age of five.

C. International migration

102. Throughout history, international migration has been motivated by economic considerations. In recent times, migration for resettlement, labour migration and flows of undocumented migrants have all been associated with significant economic disparities between sending and receiving countries. Although the forces giving rise to the movement of refugees are often non-economic in nature, the presence of refugees has economic repercussions.

103. During the past 30 years, the two main destinations of labour migration in the world have been the industrialized countries of Western Europe and the oil-producing countries of the Middle East. In both regions, immigration was promoted by the Governments of receiving countries to satisfy the labour needs of their growing economies. In recent years, the labour-importing countries of Western Europe and the Middle East have experienced a period of expansion followed by a recession. During the former period, inflows of foreign labour served to fuel or maintain the expansion. During the latter period, some migrants departed (often as a result of measures taken by the receiving country), while other migrants tended to remain and opt for family reunification.

104. Labour migration to Western Europe was officially stopped around 1974, but migration to the Middle East increased rapidly at about that time and peaked around 1983. The discontinuation of labour immigration in Western Europe did not, however, stop total migration. The adoption of policies favouring family reunion fueled the continued growth of the foreign population in most receiving countries, except Switzerland. It is estimated that by 1982 there were nearly 13.2 million

foreign residents in the main receiving countries of Western Europe (Federal Republic of Germany, France, the United Kingdom of Great Britain and Northern Ireland, Switzerland, Belgium, the Netherlands, Sweden, Austria and Luxembourg). 29/ By 1980, it was estimated that there were approximately 2.8 million foreign workers in the Middle East. 30/ Lack of reliable data makes that estimate a tentative one and precludes definite assertions about the evolution of migration during the early 1980s. Data on work permits issued by the United Arab Emirates, Bahrain, Kuwait and Qatar indicate a decline as of 1983 and 1984. 31/ Although the inflow of migrant workers may be declining, it appears that an increasing proportion of them are remaining after the completion of their initial contracts. 32/ Thus, as in Europe, the total foreign population in the Middle East may not decline even if the inflow of foreign labour is stopped.

105. During the period of expansion, in addition to the benefits accruing to the workers themselves, employers in the receiving countries benefited from the importation of labour that tended to prevent sharp rises in domestic wages. In periods of contraction, however, unemployment in the receiving countries was mitigated by the departure or expulsion of foreign workers, whose return tended to reduce wages, increase unemployment and underemployment and reduce foreign exchange earnings in their home countries.

106. The selectivity of migration has had undesirable impacts on some sending countries whose emigrants have tended to be better educated and to possess higher skills than the average population. 33/ In these countries the depletion of the pool of local skilled labour has been a serious impediment to the expansion of modern economic activities. In other countries, opportunities for migration have encouraged some people to invest in their own education. Although returning migrants tend to bring back some of their foreign earnings, other benefits that might be expected from the return of migrants have not always materialised. While abroad, migrants have generally experienced negligible occupational upgrading, 34/ and those choosing to return seem to be negatively selected in terms of skills, age or health. In addition, some sending countries often lack the open and flexible socio-economic environment that stimulates the success of the innovating individual.

107. Among the factors responsible for immigration to the United States, satisfaction of the need of the economy for workers plays only a minor role. It is interesting to note, none the less, that the number of foreign-born persons enumerated in the United States in 1980, 14.1 million, is of a similar order of magnitude to the number of foreigners in the former labour-importing countries of Europe. This foreign-born population included the survivors of permanent immigrants (which amounted to some 9.2 million during the period from 1956 to 1980), a small number of temporary workers and trainees about 300,000 of whom were admitted since 1971, and an estimated 2 million undocumented immigrants. Since 1981, the United States has admitted 2.8 million permanent immigrants and about 400,000 temporary workers and trainees, and may legalise up to 1.5 undocumented immigrants who presented applications during the regularisation drive that ended in May 1988.

108. Predicting likely trends in international migration is a precarious task, because international migration is greatly affected by unpredictable political, economic and social circumstances in the countries of origin as well as of destination. International migration can change dramatically, even reversing direction, in comparatively short spans of time. In the conservative approach taken in the United Nations projections, net international migration has been assumed to have occurred for over 70 countries or areas. For some countries, net migration is relatively small and, consequently, in the preparation of estimates and projections at the national level, no migration was assumed. For those countries that have a long history of international migration, a simple constant net migration flow was assumed. For other countries it was generally assumed that the current migration flows would decline and reach zero at around the year 2000. For countries in which migration has been of a temporary nature resulting from either civil conflicts, sudden change in the national economy or specific governmental policies, migration was assumed only for the period from 1980 to 1985. 35/

109. Refugee movements form a most dramatic type of international migration. Conventional refugees are those who have crossed an international border to avoid being persecuted or to escape war-like conditions in their home countries. De facto refugees include those who have left their country under normal departure procedures but are prohibited from returning home without risking their lives owing to intervening events there.

110. The current global refugee population is estimated to be about 12 million. Some three quarters are found in developing countries, including about one third in Africa. 36/ During the past few years some Western countries have tended to restrict the granting of asylum, and there is reason to believe that the proportion of refugees accommodated in the developing countries will be increased in coming years, even though developing countries have experienced serious socio-economic problems with hosting large refugee populations.

111. Approximately half of the global refugee population is presently assisted through official schemes, such as reception centres, holding centres, camps, or designated land settlements and villages. The remainder have found a place to stay on their own or in consultation with local people and authorities, legally or illegally, often in areas bordering their home countries. In addition to relief supplies, these schemes often include social infrastructure, such as schools and health centres, to which local people may also have access. But distribution of food and other relief items is limited to refugees, even in areas with groups of destitute local people. With the exception of land settlements, where refugees are given plots to cultivate, income-generating activities have only been developed for a small percentage of refugees in most official schemes. In some cases, refugees in official schemes do not always receive their entitlements; distributions are irregular and they must find supplementary sources of income. They thus often provide labour and services for surrounding host populations. Barter systems involving the exchange of donated relief items for items of local production between refugees and their hosts have developed in some areas. A recent large-scale survey of the socio-economic conditions of refugees in Pakistan, which hosts about one fifth of the estimated global refugee population, found that new

arrivals have less means at their disposal per household member than those who arrived earlier, and are most frequently subject to irregular food distributions. Some refugees have experienced conflict with local citizens when seeking employment or agricultural land, or when collecting firewood and other natural resoures. 37/ Similar friction has been reported in other countries as well.

112. In areas with relatively abundant resources and a buoyant local economy, refugees are well received by many. They are willing to engage in menial tasks despised by others, including unskilled manual work for local farmers. Refugees will search for vacant land and develop their own agriculture, or supply unskilled and semi-skilled labour to local building contractors and manufacturers. Some take up crafts and trade and increase the varieties and quantity of locally available goods. But because more of the casual and unskilled work is undertaken by the refugees, their activities may indirectly worsen the conditions of some members of local vulnerable groups such as female heads of households, the disabled, and the elderly, who depend on this work for their incomes. Over time, friction between refugees and these groups may materialize, and some refugees or local destitute groups may leave the area. The refugee inflow on balance, however, contributes positively to the general development of areas with adequate resources and economic growth.

113. In poorer areas, refugees are resented by many. As they flood the labour market, wages drop for casual labour and even for semi-skilled and skilled jobs. Local prices for food, fuel, medical supplies and commodities may rise. Refugees may collect firewood for fuel in neighbouring areas and further afield, contribute to deforestation in some areas and impede the access of local people to common property resources. Although employers benefit from the ready labour supply provided by refugees, many workers and destitute groups do not. The resentment may lead to violence, with the result that a part of the refugee population may be relocated and have to start again in a new setting.

114. It is, of course, impossible to predict whether or not the size of the refugee population will tend to increase over time, because of the unpredictability of conflicts that give rise to them and of solutions to ongoing ones. None the less, in countries that presently host large numbers of refugees, budgetary provisions will have to be made for the foreseeable future.

V. TRENDS AND PROBLEMS IN THE PHYSICAL STATE OF THE WORLD

A. Energy

115. Notwithstanding the current excess of production capacity in the world oil industry, energy remains a central concern for medium-term and long-term economic analysis. The harnessing of energy to enhance human labour is, in a sense, the essence of economic development. Prospects for energy consumption, production, and prices are, therefore, essential to the formulation of development strategies. Moreover, many environmental issues are directly related to energy questions.

1. Historical trends and the changing stances of energy policies

116. The period from 1973 to 1985 witnessed large changes in the demand for energy and the composition of supply. Adaptation to the large increases in oil prices in 1973-1974 and 1979-1980 took many forms. In the industrialized countries, large increases in energy efficiency resulted from, inter alia, the development of less energy-intensive capital goods and consumer durables, the retrofitting of heating systems and reduction of heat losses in residential and non-residential structures. At the same time, shifts in the pattern of final demand increased the share of less energy-intensive industries in GDP. The combination of these factors caused the energy intensity of output to decline very substantially, from about 3.85 barrels of oil equivalent per $1,000 of real GDP in 1973 to about 2.80 in 1985. While the rate of growth of real GDP averaged 2.25 per cent annually over that period, primary energy consumption declined by 0.23 per cent per year.

117. A large part of improved energy efficiency in the developed market economies was the result of changes in policy after the oil price rise of 1973 and 1974. By the end of 1980, most of the developed market economies had begun to decontrol domestic oil and natural gas prices. In addition, taxes, subsidies, and regulations governing energy use were introduced or strengthened. Thus, fuel efficiency standards for automobiles were implemented, gasoline taxes were raised, and speed limits were lowered. In the residential-commercial sector, insulation codes for new buildings, tax incentives for the insulation of existing structures, and room temperature standards were widely employed. Tax incentives and mandatory rules regarding substitution of other fuels for oil in industrial boiler firing and electricity generation were in effect in several countries.

118. Market responses to changes in relative prices and to measures undertaken by Governments led to major shifts in the level and composition of energy production between 1973 and 1985. Coal, natural gas and nuclear energy and renewable sources (such as hydropower, solar and geothermal energy) increased their share in total production of primary energy from 51 to 57 per cent during the period, while the share of liquid hydrocarbons fell from 49 to 43 per cent. Production of oil increased rapidly in the developed market economy countries, most notably in Alaska and the North Sea, in the developing countries that are not members of the Organization of Petroleum Exporting Countries (OPEC), and in the Union of Soviet Socialist Republics. Those trends had a major impact on the pattern of world trade. In 1975 the share of OPEC in world exports of crude oil was 61 per cent; it was 40 per cent in 1985 and has since declined further.

124. The maintenance of oil prices below roughly $15 per barrel (in 1987 dollars) for extended periods is also unlikely, since this would require key producers to expand rates of output toward levels at which marginal operating costs equalled marginal revenues, behaviour which is at variance with present institutional arrangements. Hence, both scenarios considered in the analysis are based upon the assumption that real oil prices will vary between the mid-teens and mid-twenties (in United States dollars) over the remainder of the century.

3. Baseline scenario of the world energy economy

125. Baseline scenario A depicts the future evolution of the world's energy economy on the basis of present policies. While not simply an extrapolation, this scenario embodies trends that are rooted in the events of the past - in the pattern of relative energy prices now prevailing in the marketplace and in the policy measures already in effect?

(a) Future trends in consumption

126. Energy consumption of the industrialised market economies would rise from 1986 to 2000 at an average annual rate of about 1.4 per cent, a very modest rate by historical standards. This is consistent with a rate of growth of gross domestic product of about 2.5 per cent per year and a further decline in the energy elasticity from its current level of about 0.60 to an average of 0.55 over the remainder of the century. 44/

127. The figures on energy consumption by end-use (table 17) show that the price and policy changes of the past are expected to alter considerably the pattern of energy consumption in the developed market economies by the year 2000. The increase in the share of the transformation sector reflects mainly the increase of the share of primary energy being devoted to electricity generation, from 30 per cent in 1987 to 32 per cent in the year 2000. Within final energy consumption, the share of industry would rise, largely at the expense of the transportation and the residential-commercial-agricultural sectors. Transportation would be especially affected as the impact of mandatory fleet efficiency standards continue to make themselves felt. The industry sector is also expected to change internally as the shift away from energy-intensive industries continues.

128. Under scenario A, the next decade would witness continuing adaptations in energy use in the developing countries to past rises in energy prices and to conservation measures already in effect. As a result, the energy elasticity in oil-importing developing countries would drop to an average of about 1.00 over the next decade, from a present level of about 1.10. Energy consumption would thus increase at the same average annual rate as GDP. The absolute level of energy consumption in the developing countries as a whole would rise from about 46 million barrels per day of oil equivalent in 1986 to 79 million in the year 2000.

Table 17. Distribution of the primary energy requirements of the developed market economies by end-use, and percentage share, 1986 and 2000

	1986		2000 (scenario A)		2000 (scenario B)	
	mbdoe a/	Per-cent-age	mbdoe a/	Per-cent-age	mbdoe a/	Per-cent-age
Energy transformation b/	22.5	30.5	28	32	29	32
Final consumption	50.7	69.5	60	68	61	68
Industry	17.4	23.9	22	25	23	26
Transportation	15.0	20.6	17	19	17	19
Residential, commercial, agricultural	16.8	23.0	19	22	19	21
Non-energy uses	1.5	2.0	2	2	2	2
Total primary energy requirements	72.9	100.0	88	100	90	100

Note: Figures may not add to totals because of rounding.

Sources: 1986: Energy Statistics Yearbook, 1986, to be issued as a United Nations publication;

2000: United Nations Secretariat estimates.

a/ Million barrels per day of oil equivalent.

b/ Energy conversion losses, internal use by energy industries, and distribution losses.

129. As shown in table 18, the pattern of energy use in the developing countries at the end of the century would also be quite different from its present pattern. The share of final consumption represented by the residential-commercial-agricultural sector in developing countries would decline, reflecting the faster growth of industry and transportation relative to agriculture.

130. In the centrally planned economies, a 1 per cent rise in net material product output at present requires a rise in energy input of about 0.77 per cent. Under scenario A, which incorporates the sort of normal efficiency improvement one might expect on the basis of past trends, the energy elasticity declines to an average of 0.70 over the period from 1987 to 2000. Given the rate of growth of net material product assumed in the baseline scenario, such an elasticity would imply a rise in energy consumption of about 2.45 per cent annually.

124. The maintenance of oil prices below roughly $15 per barrel (in 1987 dollars) for extended periods is also unlikely, since this would require key producers to expand rates of output toward levels at which marginal operating costs equalled marginal revenues, behaviour which is at variance with present institutional arrangements. Hence, both scenarios considered in the analysis are based upon the assumption that real oil prices will vary between the mid-teens and mid-twenties (in United States dollars) over the remainder of the century.

3. Baseline scenario of the world energy economy

125. Baseline scenario A depicts the future evolution of the world's energy economy on the basis of present policies. While not simply an extrapolation, this scenario embodies trends that are rooted in the events of the past - in the pattern of relative energy prices now prevailing in the marketplace and in the policy measures already in effect?

(a) Future trends in consumption

126. Energy consumption of the industrialised market economies would rise from 1986 to 2000 at an average annual rate of about 1.4 per cent, a very modest rate by historical standards. This is consistent with a rate of growth of gross domestic product of about 2.5 per cent per year and a further decline in the energy elasticity from its current level of about 0.60 to an average of 0.55 over the remainder of the century. 44/

127. The figures on energy consumption by end-use (table 17) show that the price and policy changes of the past are expected to alter considerably the pattern of energy consumption in the developed market economies by the year 2000. The increase in the share of the transformation sector reflects mainly the increase of the share of primary energy being devoted to electricity generation, from 30 per cent in 1987 to 32 per cent in the year 2000. Within final energy consumption, the share of industry would rise, largely at the expense of the transportation and the residential-commercial-agricultural sectors. Transportation would be especially affected as the impact of mandatory fleet efficiency standards continue to make themselves felt. The industry sector is also expected to change internally as the shift away from energy-intensive industries continues.

128. Under scenario A, the next decade would witness continuing adaptations in energy use in the developing countries to past rises in energy prices and to conservation measures already in effect. As a result, the energy elasticity in oil-importing developing countries would drop to an average of about 1.00 over the next decade, from a present level of about 1.10. Energy consumption would thus increase at the same average annual rate as GDP. The absolute level of energy consumption in the developing countries as a whole would rise from about 46 million barrels per day of oil equivalent in 1986 to 79 million in the year 2000.

Table 17. Distribution of the primary energy requirements of the developed market economies by end-use, and percentage share, 1986 and 2000

	1986		2000 (scenario A)		2000 (scenario B)	
	mbdoe a/	Percentage	mbdoe a/	Percentage	mbdoe a/	Percentage
Energy transformation b/	22.5	30.5	28	32	29	32
Final consumption	50.7	69.5	60	68	61	68
Industry	17.4	23.9	22	25	23	26
Transportation	15.0	20.6	17	19	17	19
Residential, commercial, agricultural	16.8	23.0	19	22	19	21
Non-energy uses	1.5	2.0	2	2	2	2
Total primary energy requirements	72.9	100.0	88	100	90	100

Note: Figures may not add to totals because of rounding.

Sources: 1986: Energy Statistics Yearbook, 1986, to be issued as a United Nations publication;

2000: United Nations Secretariat estimates.

a/ Million barrels per day of oil equivalent.

b/ Energy conversion losses, internal use by energy industries, and distribution losses.

129. As shown in table 18, the pattern of energy use in the developing countries at the end of the century would also be quite different from its present pattern. The share of final consumption represented by the residential-commercial-agricultural sector in developing countries would decline, reflecting the faster growth of industry and transportation relative to agriculture.

130. In the centrally planned economies, a 1 per cent rise in net material product output at present requires a rise in energy input of about 0.77 per cent. Under scenario A, which incorporates the sort of normal efficiency improvement one might expect on the basis of past trends, the energy elasticity declines to an average of 0.70 over the period from 1987 to 2000. Given the rate of growth of net material product assumed in the baseline scenario, such an elasticity would imply a rise in energy consumption of about 2.45 per cent annually.

Table 18. Distribution of the primary energy requirements of the developing countries by end-use, and percentage share, 1986 and 2000

	1986		2000 (scenario A)		2000 (scenario B)	
	mbdoe a/	Percentage	mbdoe a/	Percentage	mbdoe a/	Percentage
Energy transformation b/	17.8	38.9	32	40	30	37
Final consumption	28.0	61.1	47	60	52	63
Industry	8.7	19.0	16	20	19	23
Transportation	5.3	11.6	10	13	11	13
Residential, commercial, agricultural	12.5	27.2	19	24	20	25
Non-energy uses	1.5	3.3	2	3	2	2
Total primary energy requirements	45.8	100.0	79	100	82	100

Note: Figures may not add to totals because of rounding.

Sources: 1986: Energy Statistics Yearbook, 1986, to be issued as a United Nations publication;

2000: United Nations Secretariat estimates.

a/ Million barrels per day of oil equivalent.

b/ Energy conversion losses, internal use by energy industries, and distribution losses.

131. Table 19 presents estimates of the structure of final energy consumption in the centrally planned economies. The dominant category, industrial energy, accounted for over one half of final energy use in 1986; its share is expected to fall only marginally by 2000.

Table 19. Distribution of the primary energy requirements of the centrally planned economies by end-use, and percentage share, 1986 and 2000

	1986		2000 (scenario A)		2000 (scenario B)	
	mbdoe a/	Per-cent-age	mbdoe a/	Per-cent-age	mbdoe a/	Per-cent-age
Energy transformation b/	14.2	35.5	21	37	21	36
Final consumption	26.3	65.0	36	63	37	64
Industry	13.6	33.6	17	30	17	29
Transportation	3.0	7.4	6	11	7	12
Residential, commercial, agricultural	8.4	20.8	12	21	12	21
Non-energy uses	1.3	3.2	1	1	1	2
Total primary energy consumption	40.5	100.0	57	100	58	100

Note: Figures may not add to totals because of rounding.

Sources: 1986: Energy Statistics Yearbook, 1986, to be issued as a United Nations publication;

2000: United Nations Secretariat estimates.

a/ Million barrels per day of oil equivalent.

b/ Energy conversion losses, internal use by energy industries, and distribution losses.

(b) Trends in production and inter-fuel substitution

132. Considerable inter-fuel substitution is expected to occur over the next decade or so. Table 20 presents figures on energy consumption and production by fuel for the developed market economies in 1986 and in the year 2000. The most striking feature is the drop in the share of the group's energy requirements satisfied by primary liquid hydrocarbons from 39 to 36 per cent. For energy production 45/ in developed market economies, the figures for conventional oil and natural gas liquids assume that there would be a considerable degree of success in finding oil in the United States over the remainder of the century and may be somewhat optimistic. Efforts to raise reserves through extensions of known fields may, if

Table 20. Consumption and production of primary energy in the developed market economies by primary energy source, by volume and percentage share, 1986 and 2000

	Consumption a/						Production			
	1986		2000 (scenario A)		2000 (scenario B)		1986		2000 (scenario A)		2000 (scenario B)	
	mbdoe b/	Percentage	mbdoe b/	Percentage	mbdoe b/	Percentage	mbdoe b/	Percentage	mbdoe b/	Percentage	mbdoe b/	Percentage
Coal and lignite	20.0	27.4	22	25	24	27	20.0	35.0	21	33	24	39
Liquid hydrocarbons c/	28.4	39.0	31	36	30	33	14.3	25.0	11	18	12	17
Natural gas	13.8	18.9	15	17	15	17	12.1	21.1	12	19	12	16
Nuclear power	5.1	7.0	10	11	10	11	5.1	8.9	10	15	10	14
Hydro and geothermal power	4.3	6.6	7	8	7	8	4.8	8.4	7	11	7	9
Other renewable energy	0.8	1.1	3	3	4	4	0.8	1.4	3	4	4	5
Total primary energy	72.9	100.0	88	100	90	100	57.1	100.0	64	100	69	100

Note: Figures may not add to totals because of rounding.

Sources: 1986: Energy Statistics Yearbook, 1986, to be issued as a United Nations publication;

2000: United Nations Secretariat estimates.

a/ Primary energy requirements.

b/ Million barrels per day of oil equivalent.

c/ Mainly conventional crude oil and natural gas liquids.

reasonably successful, limit the decline in production there to about 2 per cent per year. Nevertheless, the 11 million barrels per day of oil produced in industrialized countries in the year 2000 under scenario A probably represents the upper limit for oil production that would be feasible under present policies. Natural gas production, although apparently offering good geological prospects, is expected to continue to be impeded by price controls in some principal producing areas under scenario A, but a gradual rise in coal and lignite production is expected by the year 2000.

133. The outlook for nuclear power in the developed market economies is uncertain. Scenario A embodies the assumption of about 2.7 per cent per year growth in electricity consumption in the developed countries, less than half the pre-1974 rate. Notwithstanding present concerns regarding reactor accidents, the absence of permanent storage facilities for spent fuel rods, high capital costs, diversion of nuclear fuel, and decommissioning costs, nuclear power is expected to represent at least 15 per cent of total energy production in the year 2000 simply because of the need for expansion of future electricity supplies and the absence of acceptable alternatives to nuclear power on a large enough scale in some countries. The scenario also includes the assumption of some expanded production of energy from renewable sources. About 90 per cent of the hydro-geothermal category is accounted for by hydroelectricity. Other renewable energy includes 0.5 million barrels per day of oil equivalent of alcohol used for stretching gasoline supplies, and about the same oil equivalent contributed by solar water and space heating.

134. Table 21 presents the distribution of energy consumption and production by energy source in developing countries in the year 2000. Achieving a rough balance among modern energy sources is more difficult in developing countries than in the developed market economies and the centrally planned economies because current production is very heavily skewed towards traditional non-renewables. Thus, they would still be heavily dependent on liquid hydrocarbons at the end of the century. Of the approximately 50 million barrels per day of oil equivalent of crude oil and natural gas liquids produced by developing countries, in scenario A, members of OPEC would account for about 39, and other developing countries, for about 11. To rise from approximately 19 million barrels a day of oil equivalent in 1987 to 39 in 2000, OPEC production would have to grow by about 5.5 per cent per year. Assuming that, to prevent reservoir damage, OPEC Governments would, on average, require a reserve equal to 10 years' production at the beginning of the year 2001, the total amount of oil required for extraction and final year's reserve would be about 275 billion barrels. On 1 January 1988, the proven reserves of OPEC were about 670 billion barrels. Thus, even assuming no additions to reserves over the entire period and 10 years of production left over at the end of the period, the proven reserves of OPEC are nearly two and one half times as large as that required to sustain the terminal year's production under scenario A. The estimation of the production rate for non-OPEC developing countries assumes that there is no further international action to spur oil production in the developing countries beyond the current oil programmes of bilateral development agencies and multilateral development banks. Natural gas production in the developing countries is expected to more than double with much of the increment being exported.

Table 21. Consumption and production of primary energy in the developing countries by primary energy source by volume and percentage share, 1986 and 2000

	Consumption a/						Production					
	1986		2000 (scenario A)		2000 (scenario B)		1986		2000 (scenario A)		2000 (scenario B)	
	mbdoe b/	Percentage	mbdoe b/	Percentage	mbdoe b/	Percentage	mbdoe b/	Percentage	mbdoe b/	Percentage	mbdoe b/	Percentage
Coal and lignite	15.7	34.6	22	28	24	30	15.1	25.9	23	22	24	24
Liquid hydrocarbons c/	17.0	37.1	28	35	28	34	29.1	49.8	50	49	46	46
Natural gas	3.1	6.8	12	15	13	16	4.2	7.2	13	13	14	14
Nuclear power	0.4	0.9	1	2	2	2	0.4	0.6	1	1	2	2
Hydro and geothermal power	3.7	8.1	8	10	9	11	3.7	6.3	8	8	9	9
Other renewable energy	5.9	12.9	8	10	6	7	5.9	10.1	8	8	6	6
Total primary energy	45.8	100.0	79	100	82	100	58.4	100.0	103	100	101	100

Note: Figures may not add to totals because of rounding.

Sources: 1986: Energy Statistics Yearbook, 1986, to be issued as a United Nations publication;

2000: United Nations Secretariat estimates.

a/ Primary energy requirements.

b/ Million barrels per day of oil equivalent.

c/ Mainly conventional crude oil and natural gas liquids.

135. Table 22 shows the distribution of energy consumption and production by source in the centrally planned economies in 1986 and 2000. Although the heavily oil-dependent transportation sector would rise relative to less oil-dependent sectors, inter-fuel substitution and greater efficiency would diminish the relative role of liquid hydrocarbons by the end of the century. Natural gas is regarded as a transitional fuel in the group, easing the changeover from oil to coal. By the year 2000, it is expected that natural gas dependence in centrally planned economies will decline and that coal will take its place as the most important fossil fuel. The contribution of electricity to final consumption is also expected to increase but the centrally planned economies will rely on nuclear reactors for their electricity supplies more than the developed market economies. Nuclear power is thus expected to account for 12 to 13 per cent of total primary energy use by the year 2000.

(c) The pattern of energy trade

136. The differences between the consumption and production figures for certain energy sources in the earlier tables are reflected in net trade, especially in fossil fuels, as presented in table 23. Under scenario A, the current balance of international trade in coal between developed market and developing countries is expected to be reversed. Thus, a net import of 0.3 million barrels per day of oil equivalent by the developing countries and China in 1986 would become a net export of 1.0 million such barrels in the year 2000. The latter would consist of exports of coal from China, mainly to Japan. Net imports of liquid hydrocarbons by developed market countries from developing countries would rise precipitously from 12.3 million barrels per day of oil equivalent to 20, a rate of gain of 3.5 per cent per year. Nearly half of these would flow to the United States, where the oil import dependence level would reach nearly one half. Of great significance is the reversal of the role of the centrally planned economies in oil trade, from a net exporter of 1.6 million barrels per day of oil equivalent in 1986 (mainly to Western Europe) to a net importer of 2 million barrels per day of oil equivalent (mainly from developing countries) in the year 2000. Such net imports would be largely offset (in energy terms) by exports of natural gas from centrally planned economies to the market economies of Western Europe. These imports, from the point of view of the developed market economies, would be augmented by 1 million barrels per day of oil equivalent of natural gas from developing countries. Much of the latter would be imports into Western Europe by pipeline, although purchases of sea-born liquefied natural gas by Japan and the United States would also play a role.

Table 22. Consumption and production of primary energy in the centrally planned economies by primary energy source by volume and percentage share, 1986 and 2000

	Consumption a/						Production					
			2000						2000			
	1986		(scenario A)		(scenario B)		1986		(scenario A)		(scenario B)	
	mbdoe b/	Percentage	mbdoe b/	Percentage	mbdoe b/	Percentage	mbdoe b/	Percentage	mbdoe b/	Percentage	mbdoe b/	Percentage
Coal and lignite	15.7	38.7	19	34	21	36	16.0	37.7	19	33	21	35
Liquid hydrocarbons c/	11.1	27.4	15	26	14	24	12.7	30.0	13	23	14	23
Natural gas	11.0	27.1	12	22	12	20	11.5	27.1	14	25	14	23
Nuclear power	1.0	2.4	7	12	7	13	1.0	2.4	7	12	7	12
Hydro and geothermal power	1.3	3.1	3	5	3	5	1.3	3.1	3	5	3	5
Other renewable energy	0.5	1.2	1	1	1	2	0.5	1.1	1	2	1	2
Total primary energy	40.5	100.0	57	100	58	100	42.9	100.0	57	100	60	100

Note: Figures may not add to totals because of rounding.

Sources: 1986: Energy Statistics Yearbook, 1986, to be issued as a United Nations publication;

2000: United Nations Secretariat estimates.

a/ Primary energy requirements.

b/ Million barrels per day of oil equivalent.

c/ Mainly conventional crude oil and natural gas liquids.

/...

Table 23. Net trade in fossil fuels, by major region, in million barrels per day of oil equivalent, 1986 and 2000 a/

	1986			2000					
				Scenario A			Scenario B		
	Developed market economies	Developing countries b/	Centrally planned economies c/	Developed market economies	Developing countries	Centrally planned economies	Developed market economies	Developing countries	Centrally planned economies
Coal and lignite									
Developed market economies	-	-0.3	0.0	-	1	0	-	0	0
Developing countries	0.3	-	0.3	-1	-	0	0	-	0
Centrally planned economies	0.0	-0.3	-	0	0	-	0	0	-
Liquid hydrocarbons									
Developed market economies	-	12.3	1.6	-	20	0	-	18	0
Developing countries	-12.3	-	0.0	-20	-	-2	-18	-	0
Centrally planned economies	-1.6	0.0	-	0	2	-	0	0	-
Natural gas									
Developed market economies	-	1.1	0.5	-	1	2	-	1	2
Developing countries	-1.1	-	0.0	-1	-	0	-1	-	0
Centrally planned economies	-0.5	0.0	-	-2	0	-	-2	0	-

Sources: 1986: Energy Statistics Yearbook, 1986, to be issued as a United Nations publication;

2000: United Nations Secretariat estimates.

a/ A positive value is a net export of the country group identified in the column heading; negative value is net import. A value of 0.0 means a net trade of less than 100,000 barrels per day oil equivalent. Net trade of a given country group in a given fuel in 1986 may not equal production minus consumption because of (non-zero) stock change.

b/ Including China.

c/ Excluding China.

4. Scope for improved energy policies and their possible impact

137. The effect of enhanced policies for energy efficiency and greater inter-fuel substitution are shown in scenario B. Such policies could reduce the energy elasticity by about 10 per cent in the developed market economy countries, leading to a reduction in the rate of growth of energy consumption to about 1.4 per cent and permitting GDP growth to proceed at a rate of about one half a percentage point higher than in the baseline scenario. Similar or slightly larger improvements in elasticities appear to be feasible in the developing countries and the centrally planned economies; the amount of energy saved would be equal to that associated with increasing growth of gross domestic product by a full percentage point in the developing countries and by one half a percentage point in the centrally planned economies.

(a) Policy options to increase energy efficiency

138. In the developed market economies, pricing policy will play the dominant role among those measures designed to encourage energy efficiency.

139. One area in which large improvements in energy efficiency can be made in developing countries is in the energy transformation sector. This sector includes electricity generation, petroleum refining, the use of energy by the energy industry itself, and transporation of fuels and transmission of electricity. In developing countries, energy lost in transformation activities in 1984 amounted to 39 per cent of total primary energy available, i.e., 39 per cent of primary energy available never reached final consumers. For comparison, the corresponding figure for the developed market economies for the same year was 30 per cent. 46/ A large share of such losses occurs in electricity generation and transmission. To some extent, losses in this area are physically unavoidable. Nevertheless, there is great room for improvement in developing countries. The ratio of primary energy inputs to electricity outputs is about 2.6 in developed market economies, but about 3.1 in developing countries. In developed market economies, about 8 per cent of electricity produced is lost in transmission, compared to about 10 per cent in developing countries.

140. Data developed by the World Bank several years ago suggested that as much as 15 per cent of total energy consumption in developing countries could be saved without any reduction in the rate of growth of gross domestic product. About 15 per cent of the reduction could occur in the transformation sector and the remaining 85 per cent in the sectors of final consumption. 47/ Taking into account these estimates, scenario B assumes a reduction in the energy elasticity of about 10 per cent on average from 1985 to the year 2000.

141. In the centrally planned economies of Eastern Europe, potential increases in energy efficiency are large since their per capita energy consumption exceeds the average of other countries at the same level of economic development by more than twofold. 48/

142. Realizing this potential will be difficult, however. One reason is the large share of the industrial sector in total final energy consumption. For the group as a whole, industrial energy use accounts for about 56 per cent of total final energy use compared to 34 per cent in the developed market economies. 49/

143. As shown in table 16, all the centrally planned econmies of Eastern Europe and the Soviet Union have programmed increased energy savings during the current planning period, 1986-1990. In addition, some have set goals for the year 2000. In the Soviet Union, the 1986-1990 plan reflected a shift in investment priorities intended to increase the productivity of capital. A goal was set of meeting 75 to 80 per cent of the incremental demand for fossil fuels by conservation, and capital was shifted into the development of fuel saving technologies. 50/ The main source of fossil fuels savings was envisioned to be nuclear power during the 1986-1990 period, although implementation of the nuclear programme appears to have been slowed by the Chernobyl accident and reactor supply problems. The introduction of new and more fuel efficient equipment in transportation and manufacturing was considered to be the second most important source of fuel economies.

(b) Policy options to increase production and inter-fuel substitution

144. In view of excess production capacity in virtually every energy category except oil, a crash programme of policy measures in the developed market economies to expand energy production capacity is not warranted. However, further inter-fuel substitution could be encouraged. It was estimated recently that coal production capacity in the developed market economies represented over 200 years of coal consumption at the prevailing rate. 51/ Continued governmental involvement in research and development programmes for more efficient coal transportation systems, cleaner and more efficient coal burning methods, and coal liquefaction and gasification could be helpful. Governments could stimulate greater use of coal and natural gas by gradually increasing the price of residual fuel oil in the secondary electricity generation and industrial boiler firing markets. Increasing the use of natural gas as a substitute for oil and coal could contribute to easing the problem of global warming (see sect. B below).

145. The next generation of liquid hydrocarbons will be composed of heavy oil 52/ (petroleum with a specific gravity of 0.934 or more) or shale oil (a petroleum-like substance formed by melting the kerogen found in certain sedimentary rocks). The developed market economies contain about 28 per cent of the world's resources of the former (on an "in-place" basis) and about 68 per cent of the world's deposits of the latter. 53/ Further government support for research to develop commercially viable production technologies could provide insurance against interruptions of supplies of liquid fuels from normal sources.

146. The concerns regarding the hazards associated with nuclear energy mentioned earlier cannot be simply ignored. Nor can the nuclear option be lightly abandoned, given the fact that nuclear power represents one of the few electricity sources which is expandible on a large scale.

147. Finally, the developed market economies have the option of pursuing the development of a broad spectrum of renewable electricity sources. 54/ Some developing countries have large known deposits of fossil fuels or unexploited major hydropower sites, which can be used to increase domestic energy production and reduce imports, provided that they can obtain the necessary finance for the sizeable investments required.

148. Many developing countries presently rely very heavily on the principal forms of biomass, firewood, or vegetable and animal wastes, and have few alternative energy sources. In many developing countries, however, the rate of destruction of wooded areas far exceeds the rate of replanting of such areas. Thus, one element in an energy production strategy for many developing countries could be a programme of orderly reforestation.

149. For a very few large developing countries with large electricity grids, the construction of nuclear power reactors might be a partial solution to the problem of augmenting supplies of commercial energy, in spite of the range of serious concerns regarding nuclear power. For most developing countries, however, the rapid development of their energy natural resources must be the primary goal, especially over the short and medium term.

150. The centrally planned economies, although rich in fossil fuel resources, face their own particular challenges in expanding energy production over the rest of the century. One of the most serious challenges is enlarging their proven reserves of petroleum fast enough to permit the increases in oil production needed for both domestic and foreign trade purposes. In the Soviet Union, by far the largest oil producer in the group, current production, rather than exploration, had been emphasised for a number of years. In 1978, however, GOSPLAN ordered a significant increase in exploration to curb the erosion in the country's reserve-production ratio. Romania is struggling to regain the self-sufficiency in energy it once enjoyed. With the increased emphasis on the exploration phase of the petroleum production process in the major oil producing centrally planned economies, policy attention has focused on the prompt introduction of state-of-the-art exploration technology, elimination of equipment supply bottlenecks, and the provision of appropriate incentives in exploratory work.

151. In contrast to petroleum, the problems of the natural gas industry in the Soviet Union are mainly long distances to markets and very hostile producing environments. The Soviet Union is estimated to contain between 35 and 40 per cent of the world's reserves of natural gas, and the reserve to production ratio is not a constraint on current production. 55/ Policy will have to be oriented towards meeting the investment requirements of specialized production equipment and infrastructure.

152. The centrally planned economies are amply endowed with coal resources, but bringing those resources into production will require massive investments. It has been estimated that about 28 per cent of the Soviet Union's coal production originates in mines that had been in operation for over 20 years. 56/ A good portion of the coal resources needed for capacity replacement and all of that required for net expansion will have to come from east of the Urals. Distances

from these mines to the major Soviet industrial complexes range from 1,000 to 2,000 miles. Increasing productivity in a labour force in which only about a quarter of the workers ar in the 20 to 35-year-old age group, 56/ overcoming the technical obstacles associated with the massive, and critically important, Kansk-Achinsk lignite, will also be major policy challenges. Poland, the world's fourth largest coal producer, needs to accelerate the opening of new fields in the Lublin area in order to continue to satisfy domestic and export demand.

153. Nuclear energy will become an increasingly important contributor to energy supplies in the centrally planned economies in the years ahead. In the Soviet Union, it will be especially important to the major industrial centres west of the Urals because the major fossil fuel developments will be far away in Siberia and the far north.

(c) The impact of enhanced energy policies

154. In addition to the reduction in the rate of growth of overall energy consumption already mentioned, a more active policy stance in developed market economies would reinforce the reallocation of energy from the transportation sector to industry.

155. In the developing countries, the measures described above are assumed to reduce the energy elasticity to 0.85 in scenario B. The growth of energy consumption would thus be 4.25 per cent per year, about the same as in scenario A, even if GDP grew by 1 percentage point more, i.e., at 5.0 per cent annually, which is the assumption for this scenario.

156. As discussed above, authorities in the centrally planned economies have adopted plans for considerably increasing energy efficiency. In that scenario, vigorous implementation of energy efficiency measures are assumed to reduce the energy elasticity in the centrally planned economies to an average of 0.65 over the rest of the century. Such a large improvement in energy efficiency, in the context of stimulated production, could raise the rate of growth of energy consumption to 2.6 per cent, consistent with an increase in the rate of growth of net material product to 4.0 per cent per year.

157. Relative to the baseline scenario, scenario B would assume a reduction of the comparable role of hydrocarbons, especially petroleum, in the industrialized market countries; the use of coal, nuclear power, and renewable energy sources would be increased but production of liquid hydrocarbons in 2000 would be about 1 million barrels per day greater. Additional natural gas production is also assumed, despite geologic factors that would constrain the maximal rate of output by the end of the century. The growth rate of coal production of a little over 1 per cent per year in scenario B is clearly sustainable in physical terms over the rest of the century, although a number of environmental concerns would have to be addressed, which would slightly increase its cost.

158. Under scenario B, production of crude oil and natural gas liquids would need to rise to only 33 million barrels per day of oil equivalent in the OPEC countries at the end of the century, as increased investment in developing countries for oil exploration could result in as much as 13 million barrels per day of oil equivalent being produced in non-OPEC developing countries by the end of the century. Total primary energy production in developing countries in the year 2000 would, however, be less under scenario B than under scenario A. Although energy production for domestic consumption is higher in scenario B, energy production required for export is reduced because of greater energy efficiency and increased production in the developed market economies and the centrally planned countries.

159. Conventional oil production in the Soviet Union is also assumed to rise gradually in scenario B, reflecting the employment of more sophisticated technology and the contributions of new fields in Siberia.

160. The policy measures subsumed in scenario B, albeit directly oriented towards increasing energy consumption efficiency and expanding energy production, would also contribute to better overall balance in energy trade among country groups. Thus, the developed market economies' net imports of coal in the year 2000 would be eliminated, although the approximate equality between production and consumption of coal for the group as a whole would conceal a large intra-group trade in this commodity with large flows from Australia, Canada and the United States to Japan and Western Europe.

161. International trade in oil would also be altered significantly from its present pattern in scenario A. Imports into the developed market economies would double by the year 2000, as domestic production declined and consumption grew. Similarly, the centrally planned economies would shift from net exporters to net importers of oil. In both cases, the Middle East would be the main source of the oil imports involved.

162. The brevity of the period remaining until the end of the century, coupled with the long time lags inherent in the energy sector, militate the achievement in scenario B of results which are quantitatively very different from those portrayed in scenario A. Nevertheless, the effects of an active policy stance could be qualitatively very important. The world's dependence on oil from a single geographic region, the Middle East, would be reduced by about 15 per cent in scenario B relative to scenario A. Imports of oil by developed market economies would decline by 2 million barrels per day (10 per cent), and centrally planned economies would achieve internal balance in oil consumption and production. (In scenario B, the group would remain a net energy exporter due to natural gas exports.) The share of oil in global energy use would decline by two percentage points relative to the passive policy case, and relatively under-utilized energy materials - mainly coal and lignite - would be more fully exploited. Overall, better balance, both geographically and with regard to energy source, could result from more active energy policy.

B. Environmental issues

163. The impact of rapidly growing population and economic activity on the earth's ecosystems pose increasing risks to the world. None the less, mankind has the ability to make development sustainable, that is, to ensure that it meets the needs of the present without compromising the ability to meet those of the future. The concept of sustainable development involves the recognition of constraints that are imposed by the current state of technology, socio-economic conditions and the state of the environment. Furthermore, far from requiring the cessation of economic growth, sustainable development includes the recognition that the problems of poverty and underdevelopment cannot be solved unless economic growth proceeds at a vigorous pace. However, sustainable development involves more than growth. It requires a change in the content of growth, to make it less material and energy intensive and more equitable in its impact. Inequalities in international economic relations, coupled with inappropriate economic policies in many developed and developing countries alike continue to adversely affect the sustainability of the development process and may inadvertently cause environmental degradation. Hence, adequately safeguarding the environment is inherent in the concept of sustainable development.

164. Environmental stress has long been seen as a result of the growing demand for scarce resources and of pollution generated by rising living standards. But poverty itself creates environmental stress also. In order to survive, the poor and hungry are often forced to destroy their immediate environment as they cut down forests, overuse marginal agricultural land, permit their livestock to overgraze grasslands, and eventually migrate. Because the economic and social problems of many developing countries are extreme, urgent tradeoffs often arise between protecting the environment and satisfying basic short-term needs. For example, it is hard to quickly find alternatives to rapidly dwindling fuelwood stocks, or dung for burning. Severe air and water pollution are tolerated in many cities because they permit gains in living standards that are deemed more valuable than the immediate benefits of abatement, and because the long-term benefits of pollution abatement are heavily discounted.

165. Proper management of the natural resource base is especially important in developing countries, which cannot afford soil degradation and other irreversible losses of potentially renewable resources, or the costs of efforts to remedy environmental damage. Conventional measures of economic well-being, such as GDP per capita, can be misleading, as they do not recognize the depletion of the stock of natural resources as a loss of wealth that will limit future income. Growth derived from resource depletion is quite different from that obtained by ecologically sustainable efforts.

166. International economic relations pose a particular problem for developing countries trying to manage their environment, since the export of natural resources is a large factor in their economies. The instability and adverse price trends faced by these countries make it difficult for them to manage their natural resource base for sustained production. Recent trading patterns reveal a transfer of environmental costs from industrial to developing countries. If developing countries had been required to meet the environmental standards that prevailed in

the United States, they would have incurred direct pollution control costs of $5.5 billion in 1980 with respect to their exports of manufactures to OECD countries, which amounted to $48 billion. In addition, it has been estimated that, if the pollution control expenditures associated with the materials that went into the final product were also counted, the costs would have risen to $14.2 billion. This is probably an underestimate, as it relates only to the impact of environmental pollution and does not allow for the costs of soil degradation, deforestation, desertification and other deterioration of resources. 57/

167. Many environmental risks stemming from economic production and consumption cross national boundaries and some are global in scope. Although the activities that give rise to these risks are concentrated in a few, mostly industrial countries, the risks are shared by all countries whether they benefit from these activities or not, and most countries have little influence on the decisions that affect these activities. These risks include harmful effects from hazardous waste and from increasing concentrations of carbon dioxide and chlorofluorocarbons in the atmosphere, as explained in the following sections.

1. Hazardous wastes

168. For many toxic substances and chemical wastes, 58/ neither destruction nor permanent safe seclusion from the environment is possible. Not all existing removal facilities are able to abate wastes without any further risks to human health and environment. Dump sites and surfaces impoundments may release toxic substances through leakages into the soil, aquifers, and surface waters. Even lined dump sites are endangering aquifers in the long term. Mixing different kinds of chemical wastes can magnify the hazards to health and well-being. Technologies of mixing hazardous wastes with household wastes and their dumping have led to many serious incidents of underground pollution but are nevertheless still practised in many countries. Incineration can effectively destroy organic wastes, when performed under controlled conditions. But it can generate highly toxic residues that have to be disposed of. Waste incineration is also responsible for some toxic air pollutants.

169. Developing countries produce, import, apply and dispose of hazardous substances on an increasing scale. Many of them suffer from a lack of capacity in data collection about toxicity and for the safe handling and/or managing of hazardous wastes, combined with inadequate awareness of the nature of hazards.

170. After decades of uncontrolled dumping, industrialized countries and increasing numbers of developing countries have discovered that the cost of ignorance and neglect is high. The "Super-fund" clean-up programme of the United States, for example, will cost $US 8.5 billion for the period from 1986 to 1990 and the eventual cost of clean-up activities in the Netherlands could be as high as $US 5.6 billion.

171. A reduction of waste generation at the source is the only reliable way to achieve improved environmental quality. Despite some encouraging examples of low-waste technologies and innovative measures by some companies, source reduction

is still largely untried. Until now, the costs of pollution control in the United States have amounted to only 1 or 2 per cent of total business costs.

172. Transboundary shipment of hazardous wastes is a growing, troublesome phenomenon. In 1983, approximately 2.2 million metric tons made 100,000 border crossings in Europe. Between 1982 and 1983, the amount of wastes shipped abroad virtually doubled in Western Europe. The frequency of transboundary shipment of hazardous wastes from North to South is likely to grow as well, as developing countries may accept hazardous wastes in return for hard currency or needed industrial goods. It is extremely difficult for national regulatory bodies to ensure that the wastes are properly handled and disposed of. Once wastes cross national borders, they are subject to varying and, at times, conflicting regulations. The exporting of hazardous wastes to countries willing to accept them also weakens domestic economic systems of incentives for reduction of wastes at source. Moreover, it transfers the risk involved to the importing countries without necessarily transferring the knowledge or managerial capability of dealing with them. Transboundary transfer of hazardous wastes may thus often magnify such risks. 59/

173. Major technical and regulatory measures need to be introduced, especially in the developing countries, in order to ensure safe handling and/or managing of hazardous wastes. These should include: promulgation of procedures and methods, such as environmental impact assessment, to evaluate alternative means and sites of waste disposal and to take into account the implications of importing such wastes; building up environmental assessment and management capabilities, to ensure control and safe disposal of hazardous wastes.

2. Greenhouse gases and climate change

174. Increasing concentration of certain trace gases may cause significant increases in the earth's temperatures over the next 50 years. If such increases occur, they would entail major ecological, economic and social consequences. Since the likelihood of such global warming is high, and the causes behind it are known, it needs to be managed carefully in order to minimize its likely adverse impacts on human welfare.

175. Solar radiation absorbed at the earth's surface is re-emitted as infrared radiation, most of which is first absorbed in the atmosphere, and then partly radiated back into space. The dynamic interchange of infrared radiation between the earth's surface and the atmosphere is controlled by "greenhouse gases", which absorb the radiation. Among these, carbon dioxide is quantitatively the most significant. Others include methane, nitrous oxide, methyl chloroform, ozone, chlorofluorocarbons, carbon tetrachlorides and carbon monoxide. The concentration of carbon dioxide in the atmosphere has increased by about one quarter since pre-industrial times, and is likely to increase by a further 30 per cent during the next 50 years. By the year 2030, the combined effect, in terms of global warming, from trace gases other than carbon dioxide will be equal to that caused by the latter, which would effectively double the rise in temperature caused by carbon dioxide alone.

176. About 95 per cent of the global carbon dioxide released by energy use and other human activities arises from the combustion of fossil fuels (about 5 billion tons of carbon) in the northern hemisphere. 60/ Forests and other components of the world's biomass are currently releasing 1 to 2 billion tons of carbon annually, of which nearly 80 per cent is due to deforestation. Annual emissions of carbon dioxide due to fossil fuels may range between 7 and 13 billion tons of carbon in the year 2000, (and between 10 and 30 billion tons in 2030). 61/ Virtually all production of chlorofluorocarbons takes place in the industrialised countries; although their use for aerosols declined from 432,000 tons in 1976 to 219,000 tons by 1984, other uses rose from 318,000 to 427,000 tons. 62/

177. Records of temperatures in the northern hemisphere indicate that the average temperature has risen by about 0.5° C over the past 120 years. While considerable uncertainty remains about the expected increase in the earth's average temperature by the year 2000, the most likely values for the expected increase are in the range of 1.5° C to 4.5° C. Such an increase is enough to have a major impact on climate, since temperatures averaged over the globe over a year contain sizeable local and seasonal variations. Temperate zone winters would tend to be shorter and warmer, and summers longer and hotter. Warmer earth would mean higher evaporation rates and a consequent increase in rainfall. Temperate winters may be wetter but summers drier; and the tropics would become wetter, while the sub-tropics could become drier.

178. Climatic change could exacerbate existing problems, such as drought, desertification and soil erosion, and worsen the prospects of sustainable economic growth for many countries. Further, it could shift agriculture polewards, reduce forest cover, expand deserts and grasslands, undermine subsistence agriculture on marginal land, increase the incidence of floods, and disrupt ecosystems. Higher carbon dioxide levels can increase the size of plants, while their food quality may deteriorate, and agricultural pests could become more damaging in a carbon-rich environment. Inter-cropping with legumes might become more beneficial in an environment with higher carbon dioxide levels. The use of synthetic fertilizer might become more costly yet more essential if soils are not to be depleted of their nutrients. Regrettably, the predictive capabilities of available models do not allow for accurate forecasting of climatic conditions.

179. Another consequence of global warming would be expansion of the oceans and a consequent rise in sea levels. A global warming of 1.5 to 4.5° C would lead to a sea level rise of 20 to 165 cm, with a middle-range temperature rise producing a sea level about 80 cm higher. Since nearly one third of the world's population lives within 60 kilometres of a coastline, this would profoundly influence habitation patterns, agriculture and industry. Moreover, further warming would take place at the rate of 0.3° to 0.8° per decade in the absence of determined efforts to reduce the factors giving rise to the greenhouse effect, leading to major changes in surface temperatures by the middle of the next century.

180. Achieving significant reductions in emissions of carbon dioxide can be accomplished by pursuing five policies:

(a) Reducing fossil fuel use through increases in end-use energy efficiency;

(b) Shifting the fossil fuel mix towards natural gas, which emits about 40 per cent less carbon dioxide than coal to obtain an equivalent amount of electricity;

(c) Replacing fossil combustion with alternative energy technologies (see, for example, sect. VII.B);

(d) Eliminating net forest loss by more careful management of development in forest areas and by large-scale reforestation;

(e) Removing carbon dioxide from the flue gas of thermal power plants (which account for 15 per cent of carbon dioxide emissions) for disposal in the deep ocean.

181. Current estimates indicate that, if used to remove 90 per cent of carbon dioxide gas, this last policy could double the cost of producing electricity. This suggests that government support for the rapid development of alternative technologies, in particular, solar energy, may be highly cost effective in the long run.

182. Vigorous application of some appropriate combination of the above-mentioned policies could limit the speed of global warming to 0.1° C per year, a rate that would make the necessary adaptation of global economic activity sufficiently gradual as to be easily manageable. 63/

3. Depletion of stratospheric ozone

183. Along with the chlorofluorocarbons, the increasing use of bromo-fluorocarbons could also lead to a significant reduction in stratospheric ozone, accelerating the incidence of skin cancer and other harmful effects of ultraviolet sunlight, which the ozone counteracts. Stratospheric ozone acts as a filter for ultraviolet radiation emitted by the sun. It also helps to regulate the earth's temperature. Ozone levels in the atmosphere are affected by some highly reactive chemicals containing carbon, hydrogen, chlorine and nitrogen, which accelerate the speed at which ozone is broken down chemically. Atmospheric concentration of trace gases, including nitrogen oxide, water vapour, chloroform, methane and chlorofluorocarbons containing these chemicals, has been increasing as a result of industrial activity. Consequently, the ozone layer surrounding the earth is threatened, particularly from rising levels of the chlorofluorocarbons. Depletion of stratospheric ozone concentrations will mean, for example, increased exposure of life on earth to ultraviolet radiation, leading to increased incidence of sunburns, eye damage, skin cancer and the aging and wrinkling of skin.

184. The trace gases that affect ozone levels are chlorofluorocarbons 11, 12, 113, 114 and 115, Halon 1211, 1301 and 2402, nitrous oxide, carbon monoxide, carbon dioxide and methane. With the exception of chlorofluorocarbons, which are used commercially, mainly in aerosols, as foam-blowing agents and in refrigeration, and of the Halons, used among others as a fire-extinguishing agent, the trace gases are produced both naturally and as a result of industrial activity. Relatively little is known about the concentrations and rates of increase of most of these trace

gases, but it is estimated that their combined potential effect of ozone destruction amounts to about 25 per cent of that of chlorofluorocarbons 11 and 12. A drop in total ozone concentration of 1.0 per cent is expected to increase harmful ultraviolet radiation (UV-B) on the earth's surface by about 2.0 per cent. 64/ A 1 per cent depletion of ozone would increase the incidence of skin cancer by about 2 per cent, and also would increase the incidence of skin infections. 65/ The recent Montreal accord calls upon the more industrialised signatories to reduce production and consumption of chlorofluorocarbons by 50 per cent by the year 1999. It has been estimated that, without the accord, an additional 131 million cases of skin cancer would occur among people born before the year 2075. 66/ Increased UV-B also has a tendency to suppress the efficiency with which the body's immune system functions. Further, plant species sensitive to UV-B, such as cotton, peas, beans, melons and cabbage, would grow more slowly and, in some cases, pollen would fail to germinate. UV-B can also damage plant hormones and chlorophyl and reduce the rate of photosynthesis. For example, a 25-per-cent depletion in ozone levels would cause a drop of 20 to 25 per cent in soya bean yields. Increased UV-B levels would also damage algae and aquatic ecosystems, perhaps leading to declines in fish stocks. Depleted stratospheric ozone would thus affect human and animal health, agriculture and fisheries.

4. Major environmental issues relating to land and water

(a) Desertification

185. World wide, it is estimated that 6 million hectares are lost to desertification each year, and that two fifths of non-desert land in Africa risks being turned into desert, as does one third in Asia and one fifth in Latin America. 67/ Human and animal pressures have accelerated the removal of vegetation and consequent soil erosion. In 1984, the world's drylands supported 850 million people, of whom 230 million were on lands affected by severe desertification. The disturbance of the ecological system has decreased the infiltration of rainwater, increased surface runoff, lowered ground-water levels, and caused the drying up of surface water and loss of topsoil and soil nutrients. Under these conditions, a drought will more quickly reduce food output and lead to famine. However, it appears that political, economic and social factors are more important than low rainfall in the process of desertification. In addition to the rapid growth of human and animal populations and detrimental land-use practices, the cultivation of cash crops on unsuitable rangelands has forced herders and their cattle onto marginal lands, thus accelerating soil degradation and outright desertification.

(b) Deforestation

186. Tropical forests cover about 1,935 million hectares, of which closed forests are 1,200 million hectares, and 735 million hectares are open tree plantations. On a global basis, the world's forests are disappearing at a rate of 15 million hectares each year, with most of the losses occurring in humid parts of Africa, Asia and Latin America. With the present rate of deforestation, about 40 per cent of the remaining forest cover in the developing countries will be lost by the year 2000. 68/ Tropical forests are being cleared for lumber and to make way for

plantations, pastures and crops. In some countries, migration by landless peasants and other unemployed people into forest areas is encouraged, but after a few harvests the soil is depleted. The main cause of deforestation under these conditions is not simply population pressure but also problems relating to balance of payments. The need for foreign exchange drives many developing countries to export timber faster than their forests are being regenerated. Overcutting also causes the loss of forest-based livelihoods, increases soil erosion and downstream flooding, and accelerates the loss of species and genetic resources.

187. Increased demand for agricultural land up to the year 2000 in the developing countries may be in the order of 80 million hectares. Some of that demand will probably be met out of present forest land. But many tropical soils are unsuitable for continuous cultivation or intense grazing and such agricultural expansion may cause ecological damage and loss of productivity. In some developing countries, programmes of transmigration and settlement for farming and/or ranching in tropical forest areas have already caused severe environmental damage, eroding long-term food security.

188. In South and South-East Asia and Latin America, deforestation in upland watersheds often causes increased flooding, followed by extended periods of low water flow during the dry season, with severe damage to soil productivity in floodplains and valleys. In India, 20 million hectares are flooded annually, partly as a result of upland deforestation. In the Ganges plain alone, flood damage exceeds $US 1 billion annually. 69/ Tropical deforestation also causes soil erosion and heavy silt loads in rivers and irrigation channels, undermining agricultural productivity.

(c) Soil degradation

189. Rapid growth of population, spread of cash crops, introduction of new technologies developed in other ecological and socio-economic contexts, pressures on earning foreign exchange and the vicissitudes of the terms of trade for agricultural exports, have disturbed the ecological stability of traditional agriculture in many low-income countries. Inputs of irrigation, fertilizers, pesticides, herbicides and new high-yielding seed varieties are essential to increasing food production in these countries.

190. Soil erosion by wind is serious in the arid parts of North Africa and the Middle East, parts of South Asia and South America. A joint Food and Agricultural Organization of the United Nations (FAO)/UNEP assessment found that, in Africa, north of the equator, 11.5 per cent of the total land area was affected by water erosion and 22.4 per cent by wind erosion. In the Near East, 17.1 per cent of the total area is affected by water erosion and 35.5 per cent by wind erosion. The problem is caused in great measure by inappropriate land use and cropping patterns. In particular, the substitution of mixed cropping - which includes plants or shrubs along with food crops - by monoculture, and the absence of proper management of land and water, have caused significant soil loss.

(d) Water management

191. All countries have deeply worrisome water resource problems. Supply constraints are increasing, aggravated by droughts, depletion of aquifers and deforestation, while the demand for water for irrigation, urban development, energy generation and industrial consumption is rising rapidly. In the world as a whole, 1,300 billion cubic metres of water are used for irrigation every year; because of evaporation and other losses, this requires that 3,000 billion cubic metres be withdrawn from available supplies. 70/ Surface water and ground-water sources in many areas are contaminated by nitrates and pesticides used in agriculture, by urban runoff and by seepage from waste-disposal sites. Greater effort is needed to assess and implement more effective combinations of pollution prevention and clean-up in order to maintain adequate water quality. Water resource management has a major international dimension, as there are some 200 internationally-shared river basins and a large number of regional seas.

192. Some 40 million hectares of irrigated area are either waterlogged or suffer from excessive salinity, or both. Salinisation may be removing as much land from production as is added by irrigation. Irrigation has greatly improved farm productivity in areas of uncertain or inadequate rainfall and has been responsible for the adoption of high-yielding varieties in many developing countries. Irrigation has to expand considerably in order to increase food production in most low-income food-deficit countries. Yet, inappropriate irrigation has wasted water, polluted ground water, and damaged the productivity of millions of hectares. Similarly, uncontrolled extraction of ground water for irrigation has depleted aquifers in Asia and Africa, laying waste pastures and cropland.

193. Acidification of peat soils in coastal areas occurs when the ground-water table is lowered and the sulphides in the soil are exposed to the air, causing the production of sulphuric acid. This drastically reduces crop and fish production when aquaculture is practised along with farming as, for example, along extensive coastal areas in South-East Asia.

C. Human settlements

194. Social progress and sustainable economic growth require an efficient spatial and administrative system of human settlements, which provides the concentration of infrastructure and buildings where people can live and work with some degree of safety, comfort and efficiency. Increased investment in shelter, infrastructure and related services can be a major source of economic growth. Construction accounted for 62 per cent of gross fixed capital formation in 1985 in the 53 developing market economies for which data were available, and for 57 per cent in 25 developed market economies. Approximately one third of the construction was devoted to housing, and two thirds to non-residential buildings and other construction (see table 24). For most developing countries, construction based on appropriate technologies and standards requires little imported material. Using inputs that are primarily domestic, including semi-skilled and non-skilled labour, it can provide a degree of insulation from external economic shocks and can be used as a macro-economic policy instrument to stabilise economic growth. Although most human settlements investments do not generate foreign exchange directly, they can contribute to the overall productivity of the economy, including the export

Table 24. Construction and other investment as percentage of gross fixed capital formation a/

Country group	Residential buildings			Non-residential buildings and others b/			Total construction			Producer durables, etc. c/		
	1970	1980	1985	1970	1980	1985	1970	1980	1985	1970	1980	1985
Developing countries												
North Africa	15	12	15	48	55	55	56	52	55	44	47	45
Sub-Saharan Africa	20	12	20	53	50	60	71	62	55	29	38	45
South and East Asia	14	15	18	43	37	37	57	52	55	43	48	45
South Asia	13	16	18	50	37	34	63	52	53	37	47	47
East Asia newly-industrialized countries	14	16	19	37	34	38	51	49	57	48	51	43
Others	15	13	15	31	40	39	46	53	55	54	47	45
West Asia	30	28	27	38	45	44	64	73	70	36	27	30
Mediterranean	20	26	15	46	41	38	65	67	52	34	33	47
Western hemisphere	23	20	22	37	37	36	60	61	64	44	39	40
Total, developing countries	20	20	22	43	41	41	60	60	62	40	40	38
Least developed countries	26	16	22	32	48	46	50	62	62	50	38	38
Developed market economies	23	25	23	36	35	33	59	60	57	41	40	43

Source: United Nations, Department of International Economic and Social Affairs, based on country data compiled by the Statistical Office of the Department.

a/ Country group percentages are weighted by gross fixed capital formation in the individual countries.

b/ Including infrastructure and land improvement.

c/ Equals total gross fixed capital formation (100 per cent) minus total construction.

sectors, and should not be ranked so low, as they have been in most developing countries, relative to conventional import-substitution or export-promotion programmes. Transforming the rural economy from one of traditional subsistence agriculture to a diversified rural sector that produces for national and international markets requires a supporting system of human settlements. Intermediate-sized towns can efficiently provide services for a modernized rural economy and process some agricultural commodities, with increased employment opportunities for rural emigrants.

1. Trends in the growth and function of urban areas

195. Urban population has been growing faster than total population in all parts of the world, especially in the developing countries, and this trend is expected to continue through the 1990s and beyond (as discussed earlier, in section IV). Although the very large so-called "megacities" in developing countries show some signs of decrease in their growth rates, their populations are rapidly passing the levels of many of the largest urban areas in the developed countries. The rate of population growth in large cities (i.e., those with a population of 2 million or more) in the developing countries is on the average 10 times the rate in the developed countries, due to the higher rate of natural increase and more rapid migration into those cities. In 1985, there were 99 cities or urban areas in the world with over 2 million residents; 30 had a population of 5 million or more and 12 had 10 million or more. By the year 2000, the number of urban areas in the world with over 5 million inhabitants is expected to reach 48, of which 37 will be in the developing regions (see table 25). There is little evidence to indicate that the largest projected "megacities" will be technically unmanageable, despite fears to the contrary. Nevertheless, revised policies and administrative mechanisms for urban expansion and operation are badly needed to improve, or at least to maintain, their efficiency and livability.

Table 25. Urban areas with more than 5 million inhabitants, 1970-2000

Year	Number of urban areas with more than 5 million inhabitants			Percentage of total urban population in such areas		
	World	Developed countries	Developing countries a/	World	Developed countries	Developing countries a/
1970	20	9	11	12.4	12.3	12.5
1985	30	10	20	14.2	12.1	15.8
2000	48	11	37	17.0	12.0	19.5

Source: United Nations, Department of International Economic and Social Affairs, based on The Prospects of World Urbanisation, Revised as of 1984-85, New York, 1987 (United Nations publication Sales No. E.87.XIII.3), table A.9 and table 2.

a/ Including China.

196. Within urban areas, the rate of population increase, in both developed and developing countries, appears to decline as the size of agglomeration increases. The rate of growth of urban agglomerations of over 2 million inhabitants generally exceeds that of the total population, but not necessarily that of the total urban population. Taken together, the four largest agglomerations (10 million plus) in the developed countries, namely, Tokyo/Yokohama, New York, London and Los Angeles, had an average annual growth rate of 0.61 per cent in the period from 1980 to 1985 and an expected growth rate of 0.37 per cent between 1985 and 1990. In contrast, the growth rates of the total urban population in their countries (Japan, the United States and the United Kingdom) are 1.9 and 1.5 per cent for the two periods, respectively. In the developed countries as a whole, the total urban growth rates are 0.99 per cent in 1980-1985, and 0.89 per cent in 1985-1990.

197. In the developing countries, the eight agglomerations with 10 million or more people in 1985 - namely, Mexico City, Sao Paulo, Shanghai, Calcutta, Buenos Aires, Rio de Janeiro, Seoul and Greater Bombay - had an average annual growth rate of 3.9 per cent between 1980 and 1985 and an expected growth rate of 4.0 per cent in the period from 1985 to 1990. The total urban population in the six countries containing these eight cities grew at 4.1 per cent annually from 1980 to 1985 and was expected to grow at 4.02 per cent between 1985 to 1990, compared with 3.38 per cent and 3.42 per cent in the developing countries as a whole. The same pattern holds for the agglomerations with 5 to 9.9 million inhabitants (6 in the developed countries and 12 in the developing countries).

198. The demographic trends associated with urbanisation and rural-urban migration should be interpreted not simply as population phenomena but also as changes propelled by changing economic priorities. Most developing countries are rapidly changing from a predominantly agrarian economy to an economy in which urban centres will play an increasingly predominant role. On the average, over 70 per cent of GDP in developing countries already is generated by towns and cities, 71/ and this figure is expected to increase somewhat by the end of the century. 72/ At the same time, the agrarian economy is shifting to more market-oriented production, using modern technologies, and the growing presence of foreign firms generates direct and indirect demand for urban services that meet international standards.

199. The decline of traditional sectors of industry in the predominantly urban economies of many developed countries has led to deterioration of the fiscal base and the social and physical environment in many of their older cities. At the same time, fiscal incentives and new communication and information technologies have reduced the traditional advantages of large cities as locations for economic activity and large numbers of affluent workers and retired people have moved to new smaller urban centres that offer advantages of climate and amenity. Thus, the shift towards a service and high-technology economy has been accompanied by the location of most new economic activity in the suburbs and small and medium-sized cities. This is producing large shifts in the geographic structure of the population and in the age structure of the urban population.

200. Continuation of the trend towards dispersal of settlements seems likely, and this trend will not necessarily be restricted to industrialised countries while the infrastructure is not likely to be in place for this to have a dramatic influence

in the developing countries by the year 2000, if renewable-energy technologies become more practical, they could allow the development of new settlement patterns to accommodate the rapidly increasing urban population in the developing countries, and the decay of older urban centres could become a preoccupying policy issue in the future.

2. Housing conditions 73/

(a) Developed market economies

201. The quantity and quality of housing is generally satisfactory in most of the developed market economies, where a rough degree of parity has been attained between households and the number of dwellings. Housing conditions have markedly improved in all of the developed market economies since the end of the Second World War. The rate of housing construction has been higher than population growth and household formation, with the result that the scarcity of dwellings that existed after the War has almost completely been eliminated. By 1985, most of the developed market economies had over 400 dwellings per 1,000 inhabitants. As housing shortages became less of a problem, most countries shifted gradually from quantity to quality objectives in housing policy. 74/ There exist some differences between countries in terms of social access to adequate housing. In some countries, virtually the entire population is adequately housed and social-mix objectives have been largely attained. In other countries, some families are "overhoused" while others are in desperate need. Distortions created by restrictive legislation and certain tax relief measures have aggravated the situation.

202. In countries where there are still shortages of good quality housing, as in some large cities of the Mediterranean region and in Japan, new construction accounts for the bulk of housing investment. In others where there is an adequate supply of standard housing, in particular, in several of the Nordic countries, investment in the maintenance and modernisation of the existing stock exceeds that of new construction. Infrastructure needs have also gained more attention in recent years, such as the improvement and repair of aging systems in much of Europe and the expansion of insufficient networks in Japan. An acute shortage of inexpensive rental accommodations has also emerged in some large cities.

203. During most of the post-war period, per capita incomes rose more rapidly than housing costs. Income-maintenance schemes also helped to assure most households of a steady disposable income over their lifetime, and access to home ownership was made easier through housing finance innovations, tax relief measures and, in some countries, the large-scale production of homogeneous, moderate-cost, suburban housing. In the 1970s and 1980s, however, costs of housing and financing have outpaced the rise in household incomes in some countries, and high unemployment levels in many countries have made growing numbers of people dependent on government assistance to ensure that they are adequately housed. Post-war prosperity and welfare support mechanisms have encouraged the formation of smaller households, such as those consisting of elderly persons and single-parent families who had not previously been prone to living alone. More recently, however, many of

these households have had lower incomes relative to housing costs, increasing the number of people with affordability problems in some countries. Such changes in household composition and incomes have increased the demand and need for a greater supply of inexpensive accommodation in a number of countries.

204. The construction of new dwellings is expected to continue to outpace the formation of new households in the 1990s (see table 26), but many low-income and even moderate-income households will face increasing difficulty in finding affordable housing, in particular, in large metropolitan centres with high costs for land and construction, and in cities of various sizes where rent controls and other development restrictions discourage the production of new, moderate-priced housing. Rent control and home-owner tax relief measures could be largely replaced by direct subsidies to low-income households for a more efficient and equitable use of public funds and the housing stock. Tax allowances might be limited to first-time buyers for the first several years only. The revenues obtained by limiting tax relief for homeowners could pay for the direct subsidies given to needy occupants of rent-deregulated premises. Such reforms could slow the rate of growth in housing prices and reduce distortions in housing investment by placing the returns on investment on a more even footing with owner-occupancy housing, thus inducing an increased supply of rental premises. Some tenants would move to accommodations that better suited their current needs and circumstances, activating the filtering-down of the older, formerly regulated rental stock. This would facilitate labour mobility and help to meet the residential needs of low-income households and some of the homeless.

(b) Centrally planned economies of Europe

205. In most of Eastern Europe and the Soviet Union, housing conditions are much better than they used to be. Since the end of the Second World War, the centrally planned economies of Europe have invested up to 5 or 6 per cent of net material product in housing in order to meet the needs of rapid urbanization and industrialization, to replace substandard housing and to replace residential stock destroyed during the War. As a result, over 85 per cent of the population o the Soviet Union and two thirds of the population of Hungary, to take two examples, live in accommodations built after the War. By 1985, all but two of these countries had reached a level of 300 dwellings or more per thousand inhabitants. A few countries, in particular, the German Democratic Republic, have nearly achieved their goal of housing all of their population adequately, whereas others have waiting lists of various lengths for State-supplied dwellings and housing co-operative units.

206. Despite this progress, however, insufficient housing is considered to be the most pressing of social problems in those countries where housing has chronically been in short supply. The absence of sufficient residential accommodation manifests itself in overcrowding and the intergenerational sharing of premises, which in turn are believed to contribute to lower birth rates and to the rise in divorce among young couples. As the disposable incomes of households increase and their expectations grow, complaints have become more frequent about the scarcity of housing.

Table 26. Housing construction in relation to the increase in the number of households, 1970-1999: New permanent dwelling units per new household a/

Country group	1970-1974	1975-1979	1980-1983	1985-1989	1990-1994	1995-1999	Number of countries	1980 population (millions)
Developing countries								
North Africa	0.26	0.56	0.78	0.78	0.80	0.85	3	67
Sub-Saharan Africa	0.15	0.11	0.10	0.08	0.07	0.07	8	159
South and East Asia	0.37	0.76	0.31	0.37	0.51	0.67	7	112
East Asia newly-industrialised countries	0.72	0.79	0.63	0.84	1.17	1.59	3	46
Others	0.14	0.37	0.09	0.07	0.09	0.09	4	67
West Asia	0.58	0.85	0.81	0.71	0.67	0.62	5	65
Mediterranean	1.11	1.06	0.95	0.91	0.99	1.10	4	68
Western hemisphere	0.26	0.25	0.28	0.24	0.26	0.32	18	221
Total, developing countries	0.42	0.53	0.41	0.38	0.41	0.45	45	693
Least developed countries	0.17	0.04	0.05	0.05	0.04	0.05	3	45
Developed market economies, total	2.45	1.45	1.20	1.43	1.75	2.23	25	768
exc. South Africa	2.51	1.49	1.24	1.48	1.82	2.33	24	740
South Africa	0.37	0.24	0.26	0.19	0.19	0.20	1	29
Centrally planned economies of Europe	1.77	1.37	1.31	1.49	1.70	1.83	7	375

Source: United Nations, Department of International Economic and Social Affairs, Construction Statistics Yearbook 1984, New York, 1986 (United Nations publication, Sales No. E.86.XVII.20), and earlier volumes, and on United Nations, Department of International Economic and Social Affairs, "Estimates and Projections of the Number of Households by Country, 1975-2000" (ESA/P/WP.73), annex tables 1 and 5.

a/ Calculated as the ratio of the sum of permanent new dwelling units reported during the calendar years indicated, divided by the corresponding increase in the total number of households.

207. The improvements in housing construction, amenities and floor space per capita achieved over the past several decades in part reflect the evolution of State policies in connection with households' rising real incomes and expectations. They are also an outcome of the growing diversification that is being achieved in housing supply. That diversification, broadly defined, consists of State-supplied rental accommodations, co-operative housing and individually owned dwelling units. The options thereby provided have enabled the centrally planned economies to enlarge the financial base of housing through increased use of family savings, in accordance with the income levels of different population strata.

208. During the past few years, the above-mentioned countries have further encouraged residential construction by enterprises, co-operatives and individual means, but housing production has declined sharply in a number of countries during the 1980s. The burden of economic adjustment that has resulted from stagnating growth, shifting terms of trade, external debt servicing and higher energy costs has fallen largely on investment targets in housing and other sectors. With the exception of the German Democratic Republic, all of these countries are trailing in the construction of new dwelling units compared to the number of households formed annually through marriages and divorces. The situation is more critical when the backlog of accumulated demand is taken into account. The time spent on waiting lists for an apartment is about 5 years in Czechoslovakia, and ranges 4 to 10 years in Hungary and from 15 to 30 years in Poland, according to national sources. Waiting lists may overstate the demand for new construction, to the extent that they contain small households occupying large premises and big families in small flats. On the other hand, single adults wishing to split off from extended families, and commuters living at the edge of major cities who would like to obtain accommodations closer to the centre, generally may not place their names on waiting lists. In Bulgaria, the German Democratic Republic and Hungary, among others, preferential housing allocation is made to young families with children, partly as an inducement to reverse falling birth rates. Other groups with special needs, such as the handicapped, are also often placed on shorter lists.

209. Despite large allocations of resources to the housing sector, housing deficits have not been eliminated. In fact, the gap appears to be widening in most of these countries. Uniform approaches to housing construction and subsidies appear to be at the root of much of the problem. Some countries have introduced options designed to make more use of the capacity and willingness of households to save and supply self-help labour to obtain housing. Many households are willing to pay more for housing and even to participate in its construction if they can obtain accommodations more rapidly. The relatively successful implementation of these and other policies suggests that their wider use over a number of years could greatly reduce housing shortages. 75/

(c) Developing countries

210. The nature and scale of the housing problems in developing countries are poorly understood. A lack of basic data on the number of existing dwelling units, or on housing quality, tenure, and the number of units added to or retired annually from the stock, renders any attempt at assessing housing conditions conjectural. The limited available evidence suggests a decline in average shelter conditions in

the past decade. In many cities, 40 to 50 per cent of the people live in slums or squatter settlements, some of which have been growing at rates up to 20 per cent per year. Approximately 1 billion people are estimated to live in very poor quality housing, and this number may well double by the year 2000. Past commitments by Governments to provide affordable housing have been eroded by economic and financial difficulties in many countries, with resulting reductions in public expenditure for shelter.

211. The construction of new permanent dwellings, 76/ in relation to the increase in the number of households in a sample of 45 developing countries, has been highly correlated with their levels of per capita income and investment. During the early 1980s, the ratio in the low-income countries was less than one new permanent dwelling for every 10 additional households; the ratio in the middle-income countries was four new dwellings for 10 households, and in the higher-income countries it was 9 for 10. Thus, about 90 per cent of the additional households in the low-income countries had to double up in existing shelter or find new, temporary shelter, typically in squatter settlements lacking adequate water supply and sanitation. Although the situation in the higher-income countries was much more satisfactory, their construction of permanent dwellings was not quite enough to accommodate all of the additional households, nor to allow for replacement of the oldest stock or for rural-urban migration.

212. In recent years, rented housing has accounted for one quarter to two thirds of the housing market of large cities in the developing market economies. It has increased in response to increases in land values that prevent squatting and inexpensive owner-occupancy. In the worst cases, mostly in inner-city tenements, several households share a single room, or alternate with one another in day and night shifts. Local authorities are partly responsible for overcrowded conditions, especially where they forbid informal construction yet enforce rent controls that discourage new, authorized construction. Many housing banks and other public and private financial institutions have been unwilling to devise new policies and programmes adapted to the real needs and opportunities in the potential markets for low-cost housing.

213. If present policies on informal housing construction continue along with low investment and economic growth, little increase in the ratio of new permanent authorized dwellings to new households is expected for the low-income developing countries, and only moderate improvement (one new unit for every two additional households), is projected for the middle-income countries by the late 1990s (see table 26). With higher investment and economic growth rates, the supply of permanent housing would improve for both groups of countries, compared to the baseline projection, but still leave about 90 per cent of the new households in the low-income countries without access to permanent dwellings. In the high-income developing countries, the outlook is much better, even with slow economic growth. 77/

214. In view of the shortage and relatively high cost of officially authorized permanent housing, developing countries will have to make better use of the informal housing sector. Informal subdivisions have already gained a large share of the housing markets in many developing countries, typically supplied by

developers who illegally purchase and subdivide unserviced land at the urban periphery. Infrastructure and services are usually not supplied until well after many of the dwellings have been built. Despite the interim hardship, the delay enables households to phase their expenditures in a more affordable way. Compared to their previous living conditions, informal subdivisions provide more space and privacy to both owner-occupants and tenants, and more infrastructure and services. The quality of housing (shelter and related services) produced in the informal sector varies with per capita income and government policies. Where policies are supportive of the establishment and upgrading of informal housing, the quality difference between authorised and informal housing is often small. Increased security of tenure and public supply of water and other services have catalysed substantial investment in informal land development and shelter. However, lack of maintenance of infrastructure is a serious failing of many government-sponsored upgrading programmes.

215. As a general rule, owners spend much more on housing than renters at given income levels. For many low-income home-owners, housing is less a consumer durable than a productive investment for supplementary income. Opportunities to install a small business or rent auxiliary units and expectations of growing house and land prices and values gives a substantial premium to owner-occupancy. Since rapidly rising land prices and falling incomes make the transition from renting to ownership far more difficult than it used to be, owner-occupant landlords have a useful role in accommodating the rapidly growing numbers of urban poor. Whereas large-scale absentee landlords sometimes exploit their tenants, owner-occupants tend to have close social ties with the tenants who share their house, and are usually more concerned with minimising tenant turnover than with maximising rents.

216. In the upgrading of informal settlements, if standards are set high and full legal title is given, many of the poorest occupants sell out, or subdivide their plot and sell part of it. Poor tenants may be forced out by higher rents, replaced by households with higher incomes. Where service standards are low and a title or lease is not provided, the cost of housing does not increase very much, nor is the area improved enough to attract the middle class. Instead, limited upgrading induces the residents to remain and to improve their dwellings to earn rental income. The growing presence of middle-class households in informal settlements and subdivisions is likely to induce government officials to take more initiative in supplying and regularizing services.

(d) China

217. As in Eastern Europe and the Soviet Union, most of China's urban housing stock is supplied by the Government, either directly or through government-owned enterprises. Over 96 per cent of urban housing units have piped water and electricity and 34 per cent have toilets, according to a survey conducted in 1985. Typical shelter consists of one or two rooms per family, often with shared kitchen and bathroom facilities. In the light of an estimated shortage of 14 million dwellings in urban areas in 1982, China increased the share of housing from about 10 per cent of total State investment in the 1970s to over 20 per cent in the early 1980s. Funds invested by enterprises accounted for 60 per cent of the total investment in urban housing.

218. Rents and utility charges have been gradually increased in conjunction with price reforms, in particular, for households occupying more space than deemed necessary. Revised policies seek to encourage households to invest in new dwelling units, with payment responsibility typically divided about equally between the State, the individual buyer and his employer. The high cost of energy has led China to allow the use of light, weight-bearing clay bricks to supply the large volume of building materials needed. Reinforced concrete materials are also produced on a large scale, since they are easy to use and less expensive than steel or wood.

3. Policies for settlements development and management in developing countries in the 1990s

219. Because so much urban growth in the developing countries is still to come and because community patterns are evolving rapidly, their Governments have a great opportunity to revise their policies so as to promote more flexible and efficient urban forms and functions. There is a noticeable trend towards decentralisation of central-government powers and functions to lower-level administrative units. The effectiveness of such arrangements requires adequate financial resources and trained personnel for these units. In some developed countries, it is felt that many municipal services could be provided more cheaply and efficiently by the private sector, and that government should not be involved directly in the production of shelter. Many Governments are reconsidering their roles in the light of the potential contributions of the formal and informal private sectors, community groups, co-operatives and non-governmental organisations.

220. In the past, training programmes concerned with settlements in the developing countries were aimed at public agencies that wanted conventionally trained administrators, architects, engineers and public health personnel, and were based on often inappropriate models from the industrialised countries. In many cases, this situation continues. In the 1960s and 1970s, training programmes began to advocate that planners focus more on the intended beneficiaries of settlements development and target their efforts so as to reduce inequities. In the 1980s, budgetary constraints and growing concern with optimisation of resource use have led to increased attention to cost-effectiveness. As settlements development has gained increasing importance in national economic policies, the need to reconcile national and regional policies with local planning and local initiatives has become more urgent. The potential role of the informal sector and self-help calls for related modifications in training.

221. Governments can indirectly improve housing conditions and can use the housing sector to renew economic growth by encouraging rather than hindering informal housing investment - by providing basic infrastructure and security of land tenure to informal subdivisions and by removing rent restrictions from owner-occupied housing. Such an approach could create work for the underemployed, stimulate greater production of building materials, reduce housing capital-output ratios, and lead to more efficient use of land and infrastructure, and could be paid for by the residents themselves. By tapping the potential entrepreneurship, savings, and other underused resources of the informal sector, revised policies on shelter would reduce the need to draw on formal-sector resources needed for other parts of the economy.

VI. HUMAN RESOURCE DEVELOPMENT AND SOCIAL POLICY

222. Human resources have long been neglected in development strategies, or approached in a piecemeal fashion. An emphasis on the development of human capabilities is an approach to overall development which regards human beings simultaneously as both the means and ends of economic and social policy. As the following sections on education, health and social policy make clear, the need for

progress in this area is not confined only to developing countries. It does, however, have special relevance for the developing countries, since this approach places considerable emphasis on local resource mobilisation and on participation as an agent of constructive change. 78/

A. Education

223. Education, especially primary schooling for literacy, is both a goal of development and a means for achieving the interrelated goals of health, higher labour productivity, more rapid GDP growth and the broader goal of social integration, including participation in cultural and political affairs. The proportion of illiterates among the adult population has steadily decreased, but the absolute number has grown and there is increasing concern about the functional quality of literacy, and not only in developing countries. A population with a high proportion of illiterates is poorly prepared to cope with modern technology. Besides basic literacy and numeracy, schools should also teach some of the knowledge and methods essential for participation in a modern economy, including the agricultural sector. 79/ The more advanced levels of education are increasingly important to enable individuals and countries to understand and participate in the technological and administrative processes of the modern global economy. In practice, most Governments have not given education top priority as a development objective. However, some countries have made exceptional efforts and reduced or even eliminated illiteracy in a relatively short time, with very impressive results. At a time when great uncertainty prevails about economic prospects for many specific investment projects, the role of education and human capital formation in development stands out more clearly than ever. 80/

1. Returns on investment

224. The private rate of return to the investment cost of all levels of education is normally extremely high, especially in the developing countries, reflecting in part the government subsidisation of education (see table 27). High private rates of return explain the strength of private demand and political pressure for education, which in turn have contributed to its rapid expansion in recent decades. The social rate of return to all levels of education, although consistently lower than the corresponding private return, is generally no less than average rates of return on fixed capital investments; using this criterion, developing countries under-invest in education, especially at the primary level. 81/

225. However, estimates of both private and social rates of return, based on cross-section estimates of private earnings streams, have to be treated with caution. Earnings differences between people with different educational levels may be attributable to other individual characteristics, such as intelligence, determination and social or political status, rather than or in addition to their level of education. In so far as these are important, estimated social rates of return are biased upwards. On the other hand, such estimates may understate the social value of various "externalities" that education may generate, such as beneficial effects of educated people on the productivity of those around them or

Table 27. Returns on investment in education, by region, type and level

(Annual average, percentage)

Number of countries	Region	Social			Private		
		Primary	Secondary	Tertiary	Primary	Secondary	Tertiary
9	North Africa, Middle East and developing Europe	13	10	8	17	13	13
16	Other Africa	28	17	13	45	26	32
10	Asia	27	15	13	31	15	18
10	Latin America	26	18	16	32	23	23
45	Developing countries	24	15	13	31	19	22
15	Developed countries	..	11	9	..	12	12

Source: World Bank, Financing Education in Developing Countries, an Exploration of Policy Options (Washington, D.C., 1986), table 3, p. 7.

on the health of their families and the power of education to enrich the non-economic aspects of peoples' lives. Further, to the extent that a country's currency is over-valued and that investment in human beings uses less foreign exchange than investment in machinery and equipment, the social rate of return on educational expenditures would be underestimated relative to these physical investments. (This presumes that the educational system does not rely heavily on expatriate teachers and high-cost construction using imported materials.)

2. Literacy, school enrolment and per capita income

226. High illiteracy rates are in large measure a result of inadequate enrolment in school, as well as the absence of large-scale adult literacy programmes in most countries. In 1985, over 100 million children aged 6 to 11 were not enrolled in the developing countries (excluding China and the Democratic People's Republic of Korea). This is considerably less than the 122 million not enrolled in 1970, but the United Nations Educational, Scientific and Cultural Organization (UNESCO) projects that the number of children aged 6 to 11 not enrolled will remain at over 100 million in 2000. The number decreased in all regions between 1970 and 1985 except for the least developed countries (see table 28). For the age group 12 to 17, the number of out-of-school youth increased by 24 million between 1970 and 1985 and is expected to increase by another 23 million between 1985 and year 2000; this increase (and more, a gross increase of 24 million) would be in Africa and South Asia, while Latin America and the Caribbean should register a small decrease. The proportion of out-of-school children (in the 12 to 17 group in the developing countries) would decline from 54 per cent in 1985 to 46 per cent in the year 2000.

227. In the developed countries, the number of out-of-school youth would continue to decrease. Moreover, the enrolment figures exclude part-time vocational education, which is relatively important in some industrialized countries. In addition, at these ages, most of the out-of-school youth in the developed countries have completed primary, as well as a part of secondary education.

228. Children may be out of school (not enrolled) because there are not enough places in schools within their reach or because their families cannot afford the fees or the forgone income that the children can earn. Drop-outs include many children rejected by the school as failures or withdrawn by their parents, and children who drift from being absent into being drop-outs. Some children do not go beyond primary school because their parents regard basic literacy and numeracy as sufficient school-based competences, and perhaps as conferring a right to gainful employment. For others, places in second level education are not available; in many countries this group is growing rapidly. Some children have not yet started school but will enter later (e.g., six-year-olds in a system where the starting age is seven). Finally, there are a few young people aged 17 or under who have completed secondary school but have not been able, or have not wanted, to enter higher education.

Table 28. Out-of-school youth

(Millions)

Region	Age group 6-11			Age group 12-17		
	1970	1985	2000	1970	1985	2000
Developed countries	10	9	10	27	16	13
Developing countries a/	122	107	106	162	186	209
Africa	34	31	37	35	37	49
Latin America and the Caribbean	13	10	8	19	16	14
South Asia	75	67	64	106	133	145
Least developed countries	25	30	37	24	32	42

Source: United Nations Educational, Scientific and Cultural Organisation, "A Summary Statistical Review of Education in the World 1970-1984", ED/BIE/CONFINTED 40/Ref. 1, Paris, July 1986, page 73.

a/ Excluding China and the Democratic People's Republic of Korea.

229. In addition to limiting their education and related opportunity to eventually obtain higher-skilled, better-paid jobs, out-of-school youth in many countries, both developing and developed, face a severe lack of any early employment possibilities and the prospect of increasing competition from their better educated peers. Based on special computations drawn from census samples, it was concluded that, in five countries - Argentina, Brazil, Ecuador, Honduras and Panama - there was a sharp increase in the proportion of young adults between the ages of 24 and 34 with post-primary education in the labour force, in all occupational categories considered, between the early 1960s and the early 1980s. Although Colombia had enrolment rates below the Latin American median during the period from 1960 to 1985 for the age group 6 to 11 and around the median for the age group 12 to 17, by the year 2000, more than half of its total labour force - including the rural component - are expected to have secondary or post-secondary education. This results from an absolute decrease in the number of men and women with primary schooling (or less), beginning in the mid-1980s, at the same time as youths with more education enter the labour force in rising numbers. 82/

230. Although the reasons for illiteracy and low school enrolment are complex, the poorer countries generally have lower rates of school enrolment and higher rates of illiteracy. Public funds to provide teachers and schools are lacking, and many children drop out early, usually to work in low-skilled jobs, and tend to lose whatever literacy they attained, because it is not used in their work or at home or otherwise reinforced by any kind of literacy maintenance programme.

231. Illiteracy rates have fallen considerably since 1970, but the number of illiterate adults (persons aged 15 years and over) in the world has increased from 760 million in 1970 to 890 million in 1985, of which 870 million were in the developing countries. 83/ Nine countries accounted for three quarters of the total, India and China accounting for well over half (see table 29).

Table 29. Countries with 10 million or more illiterates aged 15 or over in 1985

Country	Illiteracy rate (per cent)	Number (millions)	Percentage of world total
India	56.5	264	29.7
China	30.7	229	25.8
Pakistan	70.4	39	4.4
Bangladesh	66.9	37	4.2
Nigeria	57.6	27	3.0
Indonesia	25.9	26	2.9
Brazil	22.3	19	2.1
Egypt	55.5	16	1.8
Iran (Islamic Republic of)	49.2	12	1.3
Subtotal		669	75.2
Other countries		220	24.8
World total		889	100.0

Source: UNESCO, "The Current Literacy Situation in the World", ST-85/WS-9, Paris, 1985, p.8.

232. The relevance of per capita income levels to a country's ability to reach high levels of literacy is indicated by comparing the literacy levels of the different groups of developing countries. By 1985, the higher income groups had reached literacy rates of 85 per cent or more for adult males and 70 per cent or more for females, while in the lower income groups, less than 65 per cent of the adult males and less than 40 per cent of the adult females were literate. In the least developed group, only 47 per cent of adult males and 27 per cent of adult females were literate (see table 30).

233. The illiteracy rate, by major subregion, is highest in South Asia (73 per cent for females and 46 per cent for males) followed by North and sub-Saharan Africa (69 and 63 per cent for females, 42 per cent for males) and West Asia (61 per cent for females, 37 per cent for males). In the least developed group, it is 73 per cent for females and 53 per cent for males (see table 30). Females have higher rates of

Table 30. Adult illiteracy rates in developing countries, 1970-1985, (illiterates as percentage of population aged 15 and over)

Country group a/	Female			Male			Number of countries
	1970	1980	1985	1970	1980	1985	
Developing countries							
North Africa	84	73	69	56	46	43	5
Sub-Saharan Africa	85	75	63	66	54	43	41
South and East Asia	72	64	60	47	40	37	16
South Asia	82	75	72	55	48	46	6
East Asia newly-industrialised countries	22	15	11	7	5	3	3
Others	47	34	28	26	19	15	7
West Asia	82	69	61	58	44	37	9
Mediterranean	48	37	29	21	13	10	4
Western hemisphere	30	22	18	24	18	14	27
Total, developing countries	67	58	53	46	38	33	102
Least developed countries	91	84	73	73	64	53	28
China and Asian planned economies	n.a. b/	48	43	n.a. b/	20	17	3

Source: Department of International Economic and Social Affairs of the United Nations Secretariat, based on country rates in UNESCO, "The Current Literacy Situation in the World", ST-85/WS-9, Paris, July 1985, and Statistical Yearbook 1987 and earlier editions.

a/ Country group rates are weighted by the population aged 15 and over in the individual countries.

b/ Data not available.

illiteracy than males in all of the developing regions; the difference is at least 20 percentage points in Africa and Asia, but much less in the East Asia newly-industrialised countries and in Latin America and the Caribbean, and only one percentage point in the developed regions. Illiteracy rates in the developing countries were lower for the 15 to 24 age group (21 per cent for males and 33 per cent for females in 1985) than for the entire adult population, but still high enough to indicate that adult illiteracy is likely to remain a major problem in the 1990s and beyond, especially in the least developed countries, where the age 15 to 24 illiteracy rate was estimated at 42 per cent for males and 64 per cent for females for 1985. 84/

234. Most of the developed countries have illiteracy rates of less than 5 per cent, after several decades of universal primary education, and can be considered as having eradicated illiteracy as a major problem. However, modern life is demanding ever higher levels of literacy skills in all countries, and many of the developed countries are concerned with the pervasiveness of functional illiteracy.

235. Although a few low-income countries have achieved relatively high literacy rates - typically those where significant development of primary education was started several decades ago, as for example in Sri Lanka - and a few of the upper-income countries still have low literacy rates, higher per capita income levels generally have allowed greater expenditure on education and consequent increases in enrolment and literacy rates. Many of the higher-income developing countries reached gross enrolment rates of 100 per cent for primary school during the 1970s, and several regions have had gross rates above 100 per cent for males and 90 per cent for females since 1980 or before 85/ (see table 31). In the lower-income regions, dramatic increases in primary enrolment were achieved in the 1970s. In the 1980s, reflecting the variations in economic performance, the gross enrolment rate in South Asia continued to improve, although the rate for girls remained far below that for boys, while the rates for both sexes fell in sub-Saharan Africa. This setback reflects diverse country performances; in the 41 sub-Saharan countries for which data were available, the enrolment rate for boys fell in 12 countries and the rate for girls fell in 13, while remaining stable or increasing in the others. In the least developed group as a whole, the enrolment rate for girls increased much more slowly from 1980 to 1985 than in the 1970s, and the rate for boys fell (from 72 to 69 per cent).

Table 31. First-level gross enrolment rates, 1970-2000 a/

(Percentage)

Country group	Number of countries	Female					Male				
		1970	1980	1985	1990	2000	1970	1980	1985	1990	2000
Developing countries											
North Africa	4	54	69	77	80	91	86	98	100	101	102
Sub-Saharan Africa	41	36	68	67	69	76	56	89	84	86	90
South Asia	5	50	60	68	75	88	84	91	98	97	100
East Asia	10	84	100	107	107	105	93	108	110	109	105
West Asia	5	49	78	94	97	103	90	106	112	109	106
Mediterranean	3	97	94	108	108	110	119	102	113	111	109
Western hemisphere	24	92	106	106	108	112	95	108	110	111	112
Subtotal, developing countries	92	62	77	82	85	92	84	97	100	100	100
Least developed countries	29	33	48	51	55	62	55	71	69	71	76
China	1	81	103	114	115	115	97	121	132	127	117

Source: Department of International Economic and Social Affairs of the United Nations Secretariat, based on country data for 1985 or the most recent available year, and for the nearest available year to 1970 and 1980, from UNESCO, Statistical Yearbook 1987, table 3.2, and earlier volumes, and the United Nations Children's Fund (UNICEF). The State of the World's Children 1988, table 4. The projections for 1990 and 2000 are based on the baseline scenario for country GDP growth.

a/ Country group rates are averages of the rates of individual countries weighted by the population aged 6 to 11.

3. Second and third level education

236. In relation to the official second-level school-age population (typically ages 12 to 17), the number of students enrolled in all types of second-level education, increased from 33 per cent for the world as a whole in 1970 to 44 per cent in 1985, responding to the high rates of private and social return noted above. Second level gross enrolment rates increased by at least 10 percentage points in most regions from 1970 to 1985, for males and for females, but the increases were smaller in South Asia and the least developed groups. The largest increases (over 20 percentage points) were for females in North Africa, West Asia and Latin America and the Caribbean, and for males in Africa and West Asia (see table 32). The female enrolment rates in 1985 were higher than those for males in the developed regions and in Latin America and the Caribbean, but considerably below the rates for males in most of the other developing regions. In sub-Saharan Africa, it was further below the male enrolment rate in 1985 than in 1970. In the least developed group, the second level gross enrolment rates have increased very little (in percentage points), reaching only 10 per cent for females and 20 per cent for males in 1985, compared with 6 and 15 per cent in 1970. 86/ In extreme contrast, in three of the East Asian newly-industrialised countries. They surged from 33 to 88 per cent for females and from 49 to 93 per cent for males, reaching the average levels of the developed regions.

237. The gross third level enrolment rate (gross enrolment divided by population aged 20 to 24) increased from 9.5 to 12.8 per cent in the world as a whole from 1970 to 1985. All of the developing subregions achieved relatively large increases from 1970 to 1980, and all of them increased at least moderately from 1980 to 1985, with the East Asian newly-industrialized countries reaching an enrolment rate for males significantly above the average in the developed regions (38 versus 33 per cent). The largest increases, by sex and type of country, were for males in the East Asia newly-industrialised countries, from 11 per cent in 1970 to 38 per cent in 1985, and for females in the developed market economies from 20 to 37 per cent (see table 33). In North America, the rate for females and males combined has been above 50 per cent since the middle of the 1970s, reaching 57 per cent by 1985, compared with about 30 per cent in the other developed market economies, 28 per cent in the East Asia newly-industrialised countries, 20 per cent in the developed planned economies, 16 per cent in Latin America and the Caribbean, and less than 10 per cent in the other developing countries of Asia and Africa. The disparity between the male and female enrolment rates in Africa and Asia increased from 1970 to 1985; in Latin America and the Caribbean, it narrowed slightly. In most of the developed market economies, approximate equality in participation was achieved by 1985; in fact, in North America, the female enrolment ratio was 7 points higher than that for males.

238. Despite relatively large increases since 1970, the third level enrolment rates remain extremely low for both males and females in sub-Saharan Africa and the least developed countries, suggesting that the poorer regions will continue to lack people with the intermediate- and high-level skills needed to absorb new technologies from the developed regions and to generate appropriate new ones suitable to their needs. To some extent, low domestic enrolment may be supplemented by enrolment in foreign universities. In the early 1980s, there were

Table 32. Second-level gross enrolment rates, 1970-2000 a/

(Percentage)

Country group	Number of countries	Female					Male				
		1970	1980	1985	1990	2000	1970	1980	1985	1990	2000
Developing countries											
North Africa	4	15	31	42	43	49	32	49	59	60	66
Sub-Saharan Africa	41	3	11	14	14	14	9	20	29	29	30
South Asia	5	14	20	21	25	31	34	37	41	44	49
East Asia newly-industrialized countries	3	33	70	88	97	99	49	78	93	96	98
Other East Asia	7	20	21	38	41	49	26	38	44	46	53
West Asia	5	17	34	39	39	42	37	56	59	59	62
Mediterranean	3	28	40	43	47	51	47	56	61	64	68
Western hemisphere	24	26	42	48	49	52	27	41	45	46	49
Subtotal, developing countries	92	16	26	30	32	35	28	38	43	44	47
China	1	18	37	32	41	57	30	54	45	53	67
Least developed countries	29	6	9	10	11	13	16	18	20	21	22
Developed market economies	23	79	87	92	95	97	80	84	91	93	96
Centrally planned economies of Europe	5	55	72	75	78	85	55	68	69	71	77
World total	122	28	38	39	42	46	38	49	50	52	56

Source: Department of International Economic and Social Affairs of the United Nations Secretariat, based on country data for 1985 or the most recent available year, and for the nearest available year to 1970 and 1980, from UNESCO, Statistical Yearbook 1987, table 3.2, and earlier volumes. The projections for 1990 and 2000 are based on the baseline scenario for country GDP growth.

a/ Country group rates are averages of individual countries rates weighted by the population aged 12 to 17.

Table 33. Third-level gross enrolment rates, 1970-2000 a/

(Percentage)

Country group	Number of countries	Female					Male				
		1970	1980	1985	1990	2000	1970	1980	1985	1990	2000
Developing countries											
North Africa	5	2.7	7.0	9.8	9.8	11.9	8.0	15.7	18.7	18.5	20.8
Sub-Saharan Africa	40	0.2	0.6	0.8	1.0	1.3	0.9	2.1	2.7	2.7	2.9
South Asia	5	2.6	3.9	4.2	5.4	7.2	8.0	10.6	11.3	12.5	14.4
East Asia newly-industrialized countries	3	4.0	7.8	17.9	20.4	24.3	11.2	21.1	38.3	41.3	45.6
Other East Asia	7	4.9	8.4	13.1	14.0	16.4	5.5	10.5	15.1	16.3	18.7
West Asia	5	1.0	4.7	5.7	5.8	7.0	6.1	9.6	10.6	10.4	11.7
Mediterranean	3	6.2	8.5	9.2	10.1	11.8	12.7	13.0	14.3	15.3	17.1
Western hemisphere	24	4.8	12.0	14.6	15.0	16.3	8.8	15.9	17.4	18.0	19.4
Subtotal, developing countries	92	3.0	5.8	7.4	8.1	9.4	6.8	10.7	12.6	13.2	14.3
China	1	0.1	0.6	1.0	3.6	8.2	0.1	2.0	2.2	5.0	10.2
Least developed countries	29	0.6	1.1	1.5	2.0	2.8	1.7	3.1	4.2	4.7	5.4
Developed market economies	24	30.5	35.3	38.2	38.0	40.6	32.6	39.2	39.4	39.7	42.1
Centrally planned economies of Europe	7	21.5	21.0	21.2	22.1	24.2	22.7	19.5	19.8	20.8	23.1
World total	124	7.4	10.7	11.3	11.5	13.5	11.7	14.0	14.4	14.8	17.1

Source: Department of International Economic and Social Affairs of the United Nations Secretariat, based on country data for 1985 or the most recent available year, and for the nearest available year to 1970 and 1980, from UNESCO, Statistical Yearbook 1987, table 3.2, and earlier volumes. The projections for 1990 and 2000 are based on the baseline scenario for country GDP growth.

a/ Country group rates are averages of individual countries rates weighted by the population aged 20-24.

over 600,000 third-level students from developing countries in 50 host countries, including 182,000 students from Africa, about 65,000 from Latin America, and over 385,000 from Asia (excluding Japan) and developing Oceania. 87/ The developed countries attracted a large majority of these foreign students. For comparison, domestic third level enrolment in the developing countries was about 25 million in 1985, including 1.9 million in Africa, 6.4 million in Latin America and the Caribbean and 16.1 million in Asia (excluding Japan). 88/

4. Public expenditure on education

239. In most of the developing as well as developed countries, education is financed and provided predominantly by the Government. In recent years, adverse macro-economic conditions and an intensified competition for public funds have reduced the ability of many Governments to finance expanding education, while the willingness of households to pay direct fees for education has not been tapped. In some countries where the population is growing rapidly, enrolment ratios in primary schools have declined recently and might decline further. However, despite the recent difficulties of adjustment, many countries have managed to sustain the increase in enrolment. But primary school enrolment rates in many of the poorer developing countries are still low, and it has become more expensive to provide wider access to education and to combat illiteracy. 89/

240. For most of the world as a whole (124 countries), total public expenditure on education represented about 5.6 per cent of GNP in 1985, compared to 5.7 per cent in 1980 and 5.1 per cent in 1970. The percentage spent by the developing countries was only 3.4 per cent in 1970; it rose to 3.7 per cent in 1980, and to 3.9 per cent in 1985. In the least developed countries, it rose only marginally, from 2.8 per cent in 1970 to 2.9 per cent in 1980, and 3 per cent in 1985 (see table 34). In sub-Saharan Africa, the stagnation in GDP after 1980 slightly reduced the absolute level of public expenditure per capita (in constant 1980 dollars), from $21 in 1980 to $20 in 1985, after an increase from $16 in 1970 90/ (see table 35). Of these totals, capital expenditure was about 1 per cent of GNP in the developed countries and about 0.4 per cent in the developing countries. Total public expenditure on education as a share of GDP increased from 1970 to 1985 in most regions; but in the developing Mediterranean, sharp declines in two countries (Turkey and Yugoslavia) after 1980 carried the regional percentage in 1985 below the 1970 level. Substantial absolute reductions occurred from 1980 to 1985 in some of the other developing countries, but the levels in were 1985 still well above those of 1970. Even with the decline in sub-Saharan Africa, after 1980, spending per capita in 1985 remained well above the average levels in South Asia and China, perhaps reflecting greater use of expatriate teachers in sub-Saharan Africa than in Asia.

Table 34. Total public educational expenditure as percentage of gross national product

Country group a/	Number of countries	1970	1980	1985
Developing countries				
North Africa	5	5.46	5.67	5.95
Sub-Saharan Africa b/	39	4.09	4.69	4.77
South Asia	5	2.54	2.73	3.33
East Asia newly-industrialised countries	3	3.24	3.28	4.47
Other East Asia	7	3.13	3.09	3.53
West Asia	6	3.82	5.22	5.62
Mediterranean	4	4.15	3.99	3.07
Western hemisphere	25	3.40	3.59	3.64
Subtotal, developing countries b/	94	3.57	3.91	4.09
China	1	1.80	2.50	2.90
Least developed countries	26	2.80	2.90	3.02
Developed market economies	24	5.34	6.05	5.94
Centrally planned economies of Europe	5	6.47	6.75	6.64
World total b/	124	5.07	5.68	5.63

Source: Department of International Economic and Social Affairs of the United Nations Secretariat based on country data from UNESCO, Statistical Yearbook 1987, table 4.1, and earlier volumes, and from the International Monetary Fund, Government Finance Statistics Yearbook 1987, p. 98.

a/ Country group percentages are weighted by the gross domestic product of individual countries.

b/ Excludes Nigeria, where 1970 and 1980 percentages were 3.3 and 6.6, including non-federal expenditures, and the 1985 percentage (federal only) was 1.3.

Table 35. Total public educational expenditure, in 1980 United States dollars per capita

Country group a/	Number of countries	1970	1980	1985
Developing countries				
North Africa	5	70.58	82.71	87.31
Sub-Saharan Africa b/	39	17.76	21.50	20.93
South Asia	5	5.11	6.55	8.95
East Asia newly-industrialised countries	3	36.96	72.63	126.07
Other East Asia	7	11.27	18.26	22.44
West Asia	6	133.77	218.34	192.12
Mediterranean	4	66.47	93.95	74.66
Western hemisphere	25	63.16	84.08	77.88
Subtotal, developing countries b/	94	26.66	37.94	38.68
China	1	2.65	6.18	10.03
Least developed countries	26	5.65	6.54	6.67
Developed market economies	24	433.23	621.12	660.43
Centrally planned economies of Europe	5	109.44	170.43	187.99
World total b/	124	109.05	145.55	149.23

Source: Department of International Economic and Social Affairs of the United Nations Secretariat based on country data underlying table 34.

a/ Country group expenditure levels are averages of individual country levels weighted by population.

b/ Excluding Nigeria, because available post-1981 data do not include large non-federal expenditures.

5. Costs per student

241. The cost per student for education in Africa, compared with other regions, is very high both in terms of operating cost ("current expenditure") per student and in proportion to GDP per capita, especially for the second and third levels (see tables 36 and 37). Although the cost per third-level student dropped from $2,900 in 1980 to $1,900 in 1985, it remained higher than in all the other developing regions, even West Asia. Since pupil-teacher ratios are about the same in Africa as in the other major regions, 91/ the high costs per student imply high average costs per teacher. These costs are mainly for salaries and other benefits received by the teachers and other personnel in the education system (60 to 90 per cent in most of the developing countries). Two interesting exceptions are the United Republic of Tansania and Bangladesh, where only about 35 per cent was spent on teachers' salaries and benefits. In the United Republic of Tansania, an unusually large share (30 per cent) was spent on teaching materials and scholarships (in 1979); Bangladesh spent less than 1 per cent on these categories, but spent 31 per cent on "school meals and board" and other welfare services (in 1985). 92/

242. Future enrolment rates will depend on the evolving levels of spending per capita and cost per student for the different levels of education. Given the relatively poor outlook for economic growth, especially in sub-Saharan Africa and other least developed countries, it will be extremely important to limit growth in per student costs below the growth of the student-age population and/or to increase the share of GDP devoted to education, if they are to reach the goal of universal primary school enrolment and adequate second-level and third-level enrolment to provide the skills needed for economic and social development.

Table 36. Public current expenditure per student, in 1980 United States dollars

Country group a/	First level 1980	First level 1985	Second level 1980	Second level 1985	Third level 1980	Third level 1985
Developing countries						
North Africa	166	178	610	424	982	998
Sub-Saharan Africa b/	63	62	210	198	2 915	1 940
South Asia	20	31	40	63	128	220
East Asia newly-industrialized countries	200	360	211	325	514	473
Other East Asia	68	94	103	125	197	170
West Asia	369	200	737	456	2 652	1 861
Mediterranean	86	81	142	121	1 700	1 125
Western hemisphere	187	171	229	176	1 439	1 132
Subtotal, developing countries b/	95	92	168	154	771	641
China	10	17	27	51	914	1 144
Least developed countries	27	30	92	89	807	343
Developed market economies	1 239	1 469	2 156	2 480	4 282	4 710
Centrally planned economies of Europe	714	768	617	617	3 177	3 546
World total b/	179	191	523	549	2 859	2 792

Source: Department of International Economic and Social Affairs of the United Nations Secretariat based on country on enrolment and the distribution of current expenditure by level of education from UNESCO, Statistical Yearbook 1987 and earlier volumes.

a/ Country group expenditures are averages of the individual country expenditures weighted by the number of students at the respective levels.

b/ Excluding Nigeria, because 1985 data cover federal expenditures only.

Table 37. Public current expenditure per student as percentage of GDP per capita

Country group a/	First level 1980	First level 1985	Second level 1980	Second level 1985	Third level 1980	Third level 1985
Developing countries						
North Africa	11	12	47	34	129	109
Sub-Saharan Africa b/	16	17	73	69	1 218	714
South Asia	8	11	17	23	58	79
East Asia newly-industrialized countries	10	14	10	12	21	19
Other East Asia	7	9	11	11	35	30
West Asia	14	8	28	16	102	82
Mediterranean	7	5	11	8	94	49
Western hemisphere	9	1	9	8	59	54
Subtotal, developing countries b/	10	11	23	24	212 (63) c/	147 (62) c/
China	4	5	12	14	396	32
Least developed countries	12	15	56	56	960	516
Developed market economies	13	14	22	23	38	38
Centrally planned economies of Europe	16	19	14	16	46	48
World Total b/	9	10	19	21	211	166

Source: Department of International Economic and Social Affairs of the United Nations Secretariat based on country on enrolment, the distribution of current expenditure by level of education and current expenditure on education as a percentage of GNP, from UNESCO, Statistical Yearbook 1987 and earlier volumes.

a/ Country group percentages are the average of individual country percentages weighted by country total population, except as otherwise noted.

b/ Excluding Nigeria, because 1985 data cover federal expenditures only.

c/ Weighted by number of third-level students.

6. Projection of enrolment trends

243. Estimates of first, second and third level enrolment rates for females and males in 1990 and 2000, shown above in tables 31, 32 and 33, have been based on the trends in enrolment and the relation between enrolment rates and GDP per capita from 1970 to 1985. 93/ Under the baseline scenario for GDP growth from 1990 to 2000, the gross primary enrolment rate (including under-age and over-age enrolled children, as noted earlier) would reach 100 per cent or more for boys and 90 per cent or more for girls by the year 2000 in almost all the subregions. In sub-Saharan Africa, however, the average rate for girls would be only 76 per cent, and the rate for boys, only 90 per cent. In the least developed countries the rates would be only 62 per cent for girls and 76 per cent for boys. As the net enrolment rates are likely to remain 10 to 20 percentage points lower than the gross rates, there will still be very large shares and numbers of primary-school-age children not enrolled in these groups of countries.

244. If GDP growth were accelerated to annual rates that were 1 per cent above those assumed in the baseline, and if a normal proportion of the incremental GDP were allocated to primary education, the gross enrolment rates in most of the developing countries could be one to three percentage points higher than under the baseline projections in 2000 (78 per cent for girls and 92 per cent for boys in sub-Saharan Africa, and 65 per cent for girls and 78 per cent for boys in the least developed countries). To reach the goal of universal primary enrolment (a net enrolment rate of 100 per cent) would thus require a considerable reallocation of resources, based on current costs per student, especially in the least developed countries and other low-income countries. In sub-Saharan Africa, 15 countries would have to spend an extra 5.3 per cent of their baseline GDP in the year 2000 (in addition to the 8.5 per cent projected under the baseline) to increase their gross enrolment rate for boys to 100 per cent (from the rates projected under the baseline); 22 countries would have to spend an extra 2.7 per cent of baseline GDP to reach 100 per cent enrolment for girls. Among the least developed countries an extra 4.7 per cent of baseline GDP would be required to reach 100 per cent gross enrolment rates for boys in 15 countries, and an extra 6.6 per cent for girls in 20 countries. As considerably larger increases would be needed to reach net enrolment rates of 100 per cent. Governments will be under pressure to reduce the cost per student in these countries, as well as to increase the total of public and private funding for primary education.

245. In secondary education, most of the subregions would reach gross enrolment rates of 48 per cent or more for males and 41 per cent or more for females in the year 2000 under the baseline scenario (see table 32). But the average rates for females would be only 13 per cent in the least developed countries, 14 per cent in sub-Saharan Africa and 31 per cent in South Asia; the average rate for males would be only 22 per cent in the least developed countries and 30 per cent in sub-Saharan Africa, though a more typical 49 per cent in South Asia. In the developed countries as a whole and in the East Asia newly-industrialised countries, the gross enrolment rate for both males and females will be well over 90 per cent. (The relatively low rates in the centrally planned economies of Europe are partly attributable to the exclusion of part-time vocational education from the enrolment statistics.)

246. Although there are no internationally agreed targets for second level enrolment rates, the increasing need in the modern economy for workers with at least second level education suggests that a goal of 75 per cent for the gross enrolment rate may be a useful benchmark target. (The corresponding net enrolment rates and graduation rates would be significantly lower.) A 1 per cent faster growth of GDP in the 1990s, in comparison with the baseline, would tend to increase the secondary enrolment rates by about two percentage points in most regions in the year 2000, but still leave many countries well below 75 per cent for males and females. Among countries that would not reach 75 per cent for males by the year 2000, most could do so by spending an extra 2.6 per cent or less of their year 2000 GDP to increase second-level male enrolment. Similarly, an extra 4 per cent or less would be needed for females in most of the 66 countries that would not reach this rate under the baseline. In sub-Saharan Africa, an extra 10.9 per cent of GDP in 30 countries would be needed for 75 per cent male enrolment, and an extra 14.3 per cent of GDP in 29 countries would be needed to reach such a target for females. The corresponding percentages that would be required in the least developed countries are even more prohibitive: 26.8 per cent of year 2000 GDP for males in 22 countries and 29.4 per cent for females in 22 countries. To the extent that costs per student in these countries are high because of reliance on foreign teachers, some reduction can be expected as an increasing number of the countries' citizens receive enough schooling to qualify as second-level teachers. But the trends in third-level enrolment, discussed below, suggest that such progress will be quite limited during the 1990s.

247. The third-level gross enrolment rate for males (total university and other post-secondary enrolment divided by population aged 20 to 24) would reach 10 to 21 per cent under the baseline scenario in the year 2000 in most of the developing regions - 46 per cent in the East Asia newly-industrialized countries - but only 2.9 per cent in sub-Saharan Africa and 5.4 per cent in the least developed countries (see table 33). For females the rate would be 7 to 16 per cent in most regions, but only 1.3 per cent in sub-Saharan Africa and 2.8 per cent in the least developed countries. A 1 per cent higher rate of GDP growth would tend to raise the male and female enrolment rates by about half a percentage point in most regions - which would be a relatively large increment in sub-Saharan Africa and the least developed countries, but would still leave them with very low enrolment rates compared to the other developing regions. To reach an arbitrary target of 10 per cent for gross third-level enrolment for males, 26 sub-Saharan African countries would have to spend an extra 9.5 per cent of their year 2000 GDP, and 17 least developed countries would have to spend an extra 25.4 per cent, based on current costs per student. To reach this target for females would require an extra 11.2 per cent of year 2000 GDP in 27 sub-Saharan countries and 21.8 per cent in 18 least developed countries. These obviously prohibitive costs indicate that third-level enrolment rates will not increase significantly in these countries unless their relatively high costs per student are reduced, by making better use of existing facilities and teachers and/or by relying more on enrolment in foreign universities (financed mainly by foreign scholarships and part-time employment in the host countries).

7. Policy issues of efficiency and equity

(a) Cost and effectiveness of higher education

248. High costs per student for secondary and higher education have limited the resources available for increasing enrolment rates in many developing countries. The costs per student for second-level and third-level education are especially high in sub-Saharan Africa, as noted earlier. The curriculum in many secondary schools is focused mainly on the goal of preparing students for university entrance in conventional academic subjects. Yet, in a growing number of developing countries, university graduates are encountering great difficulties in finding employment in their fields, while there are shortages of adequately trained technicians. Many developing countries have adopted systems of secondary and university education from the developed countries - systems that emphasize specialized academic subjects, even in programmes dealing with industry and agriculture, at the expense of more general training adapted to local circumstances. 94/

249. The cost effectiveness of sending students abroad for third-level education (over 600,000 from the developing countries in the early 1980s) is an open issue. While it is probably less expensive, per student, than rapidly building up the necessary physical facilities and importing foreign teachers, at least in small developing countries and highly specialized fields, it contributes to the "brain drain" the best secondary-school graduates of many of the developing countries and to the related foreign exchange costs, to the extent that their expenses are not covered by scholarships and employment in the host countries. 95/

(b) Private expenditures

250. In addition to the substantial share of GDP devoted to public expenditure on education, private expenditure on education accounted for another 1 per cent of GDP or more, sometime during the period from 1980 to 1985, in 19 developing countries. 96/ In several countries, the share was above 2 per cent, and in Republic of Korea, it was about 4 per cent in 1985 (5.8 per cent of personal consumption). While much of this private expenditure is probably incurred by upper income families for private schooling, including study in foreign countries, it does indicate a willingness to pay that Governments may wish to consider as they seek additional resources to expand enrolment, in particular, in universities and other third-level institutions, and perhaps in secondary schools as well, both of which now prepare a fortunate minority of the population, in most of the developing countries, for relatively high-income jobs. However, article 10 (e) of the Declaration on Social Progress and Development calls for attainment of "the assurance of the right to universal access to culture, to free compulsory education at the elementary level and to free education at all levels".

(c) Quality

251. Perhaps because of the rapid expansion of education in many developing countries, its quality is low. In part this reflects a lack of early environmental stimulation of children and the inadequacy of their health and nutrition. However,

it also reflects the quality of teacher training and the strain on resources often associated with rapid expansion of enrolment, such as overcrowded classrooms, high pupil/teacher ratios, lack of textbooks and ill-equipped facilities. In times of fiscal restriction, expenditure on physical inputs is squeezed more than salaries. In some countries there is also a problem of incentives. If the priority of pupils and their teachers is to perform well in examinations in order to secure good jobs, and if examinations test rote-learning, then repetition, memorization and rigid book-learning are encouraged in the schools - the so-called "diploma disease". Empirical research has suggested that in Brazil the social rate of return on expenditure to improve the quality of primary schooling would exceed that on increasing its quantity. Improvements in quality may be possible without raising costs, e.g., through curricular and examination reform or less reliance on seniority as the criterion for salary increases. Relatively small increases in expenditures on training in leadership and management for head teachers and the use of fees for additional textbooks may yield high returns. The involvement of parents and communities may stimulate enthusiasm for educational improvements. 97/

(d) Drop-out and repetition 98/

252. The impressive increases in enrolment since 1970 relate to the input of students into the educational system but leave unexamined the quantity and quality of its output and its internal efficiency. Although the output of an educational system is difficult to define, for primary education, possibly the main objective is to make the pupils literate. To attain this goal, children must remain enrolled and attend regularly for a sufficient number of years.

253. The point at which cessation of schooling becomes "drop-out", and hence a "problem", depends on the structure and the objectives of the educational system of each country. In the industrialized nations, any drop-out taking place during their 8 to 10 years of compulsory schooling is clearly considered to be a problem. Even to leave school after having completed only this compulsory period is regarded as undesirable in many countries, especially during the present period of high levels of youth unemployment and also because a large proportion of these early school-leavers often belong to socially disadvantaged groups. In developing countries, the stress generally is still on achieving universal primary education, and drop-out from primary education, in particular, prior to the attainment of literacy, is a matter of serious concern.

254. In 85 developing countries, 15 per cent of the pupils starting school around 1982 and 1983 dropped out before reaching second grade, and only 75 per cent would have reached fourth grade if the promotion, repetition and drop-out rates observed at that time have continued (which seems likely, given the continuing economic stagnation in many countries). The drop-out rates were particularly high in Latin America and the Caribbean (36 per cent for fourth grade) and extremely high in the Portuguese-speaking African countries (77 per cent), but comparatively low in six Arab states in Africa (12 per cent) and in 30 developing countries of Asia and Oceania (15 per cent). 99/ The high drop-out rates suggest rather limited progress in eradicating illiteracy in some developing countries, despite the rapid growth of enrolment during the last 15 years. Although Latin America and the Caribbean had gross primary enrolment ratios well above 100 per cent in 1980 and 1985, the

region's production of literate children (as a percentage of their primary-school age groups) may be about the same as in Asia and not much higher than in Africa.

255. In order to reduce drop-out rates, national education authorities should consider to what extent they are caused by the failure of students to pass an end-of-the-year examination, by a lack of teachers and facilities, by the level of school fees in relation to family incomes, and other possible causes. The high drop-out rate between the first and second grades in many countries deserves special attention.

256. Before dropping out, many students repeat one or more grades. The percentage of primary school enrolment constituted by repeaters shows wide disparities among the developing countries. In Africa, this percentage ranged from 0 to 37, with a median value of 16 per cent in the early 1980s. The range was somewhat lower in the other developing regions, with median values of 12 per cent in Latin America and the Caribbean and 7 per cent in Asia and Oceania, compared with less than 2 per cent in Europe and 0 in the Soviet Union and Japan. 100/

257. Considering that repeaters use resources that could be made available to children who are not yet enrolled, more attention should be given to this issue. Educators differ in their opinions of the benefits pupils may gain from repeating a grade as opposed to being promoted automatically. There is little doubt that a child having serious problems in assimilating the programme in one grade is likely to continue experiencing difficulties if promoted to the next grade without some extra assistance. However, it is not clear how repetition will reduce these problems if no special help is given. Where pupils are denied promotion on the grounds of immaturity, the alleged benefits from repetition may not outweigh the possible harm caused by being stigmatized as a "failure".

B. Health

1. Trends in life expectancy and mortality

258. Health, like education, is both a goal of development and a means to achieve the related goals of higher labour productivity and total economic output. The simplest indicator of people's health is life expectancy at birth (i.e., the average number of years a newborn baby can be expected to live if current age-specific mortality rates continue). In the developed countries, it has increased from 66 years in the early 1950s to 73 years in the early 1980s, while in the developing countries as a whole it has increased from 41 to 57 years. The largest regional increase was in East Asia, reflecting a dramatic increase in China from 41 years in the early 1950s to 68 in the early 1980s; in Africa it increased from 35 years to 49. Life expectancy at birth is generally several years longer for women than for men, especially in the developed countries: 76 years for women versus 68 for men in the early 1980s; in the developing countries, it was 58 years for women and 56 for men (see table 12, in sect. IV). The larger differential in the developed countries reflects their lower maternal mortality rates. The only area with a slightly lower life expectancy for women than for men is South Asia, where it was 53.0 years in the early 1980s, compared to 53.6 for men.

259. Maternal mortality rates are a good indicator of the health situation and status of women. It is the largest cause of death among women of reproductive age in most developing countries. In less developed regions, there were 450 deaths for 100,000 live births around 1983, against 30 in developed countries. 101/ Since these rates are higher in countries with high crude mortality rates, they should follow the general trends of mortality and improve by the year 2000. But the wide disparities among countries are not likely to disappear, especially as the increase of life expectancy is expected to be slower in Africa, for example, which accounts for 30 per cent of maternal deaths, as against 18 per cent of births.

260. In the past decade, there have been decreases in the infant mortality rate in nearly 150 countries, but more than a quarter, representing 29 per cent of world population, still have a rate above 100 per 1,000 live births, 102/ while the average in the developed countries is about 18 (14, excluding South Africa). Continued reductions are projected for the 1990s, but the average for the least developed countries is projected to remain above 100 during the period from 1995 to 2000, falling to 95 between 2000 and 2005 (see table 38). The International Development Strategy's goal of reducing infant mortality rates below 120 per 1,000 live births by 1990 will not be met by an estimated 21 countries, and 58 countries are projected to still have rates above the goal of 50 in the year 2000, including 39 in sub-Saharan Africa. Similarly, the Strategy's goal of increasing life expectancy to 60 years or more is projected not to be met by 49 countries in the year 2000; 38 of these will be in sub-Saharan Africa, and 31 will be among the least developed countries (see table 39).

Table 38. Infant mortality rates, a/ 1970-2005

Country group	Number of countries	1970-1975	1975-1980	1980-1985	1985-1990	1990-1995	1995-2000	2000-2005
Developing countries								
North Africa	5	136	115	95	81	67	55	45
Sub-Saharan Africa	44	142	130	122	112	102	93	84
South and East Asia	19	124	116	103	93	84	74	65
South Asia	7	137	129	115	105	95	84	74
East Asia newly-industrialized countries	3	43	32	27	23	19	16	14
Others	9	92	82	73	64	55	47	39
West Asia	13	118	104	95	85	73	62	53
Mediterranean	4	117	100	79	66	56	46	38
Western hemisphere	28	80	71	63	56	50	44	40
Subtotal, developing countries	113	121	111	100	91	82	74	66
China and Asian planned economies	4	64	46	42	35	30	25	21
Least developed countries	34	146	140	133	124	114	104	95
Developed market economies	25	25	21	18	16	14	13	11
Centrally planned economies of Europe	8	27	27	24	21	19	16	14
Total, developed	33	26	23	20	18 b/	16	14	12
World total	150	93	85	78	71	64	57	51

Source: Department of International Economic and Social Affairs of the United Nations Secretariat, based on quinquennial averages for individual countries, United Nations, World Population Prospects - Estimates and Projections as Assessed in 1984, (United Nations publication Sales No. E.86.XIII.3), annex II, and supplementary data bank. The projections for 1985-1990 and thereafter are based on the "medium variant" projection for each country.

a/ Number of deaths of children less than one year old, per 1,000 live births. Country group averages are calculated from individual country life expectancies weighted by number of births.

b/ Fourteen, excluding South Africa.

Table 39. Projected number of countries with infant mortality rates or life expectancy not meeting the goals set in the International Development Strategy for 1990 and 2000

Country group	Infant mortality rate		Life expectancy
	Above 120 in 1990	Above 50 in 2000	below 60 in 2000
Developing countries			
North Africa	0	3	0
Sub-Saharan Africa	17	39	38
South and East Asia	4	9	8
South Asia	3	6	5
East Asia newly-industrialised countries	0	0	0
Others	1	3	3
West Asia	0	4	2
Mediterranean	0	0	0
Western hemisphere	0	3	1
Subtotal, developing countries	21	58	49
China and Asian planned economies	0	0	0
Developed countries	0	0	0
Least developed countries	17	31	31

Source: Department of International Economic and Social Affairs of the United Nations Secretariat, based on country data underlying tables 12 and 38.

2. Disease and mortality - prevalence of major types of disease, and their impact on mortality 103/

261. The great majority of deaths, especially of children and older adults, have some type of disease as their proximate cause. In the developing countries of Africa and Asia, infectious and parasitic diseases (including certain respiratory diseases) account for about half of all deaths, the majority occurring among infants and young children. This group of diseases account for only one tenth of all deaths in industrialized countries, where 50 per cent are from circulatory diseases and 19 per cent from cancer. All developing countries list diarrhoea as one of the most serious problems affecting the health of their child population and one of the main reasons for contact with the health system. Diarrhoeal dehydration can now be treated quite adequately with low-cost oral rehydration therapy, yet some 3 million children still die from it each year. 104/ Six major preventable diseases of childhood - diphtheria, pertussis, neonatal tetanus, poliomyelitis, measles and tuberculosis - together kill some 4 million children each year and cause disability in 4 million more. These diseases have been selected as targets for immunization in most countries, but some still have not allocated the relatively modest resources needed to provide this protection.

262. Malaria and tuberculosis remain major public health problems, with improvement in some countries offset by deterioration in others. Malaria is an important cause of child mortality, especially in tropical Africa. Efforts to control the disease have been hampered by the emergence of mosquitoes that are resistant to the more readily available insecticides and of forms of the malaria parasite that are resistant to drugs.

263. Many infectious and parasitic diseases can be overcome by improvements in environmental and living conditions and other preventive action. In India, where 45 per cent of the national health budget is used for control of malaria by conventional methods, health officials are enlisting villagers to carry out new, environmentally safer ways to control malaria-bearing mosquitoes. 105/

264. Communicable and parasitic diseases have been greatly reduced in the developed countries by improvements in sanitary conditions, nutrition, and health services, allowing for large decreases in premature death and relative growth of the older age-groups. This aging of the population, together with the changes in life-style in industrialized societies, has contributed to the growing incidence of diseases of the circulatory system, which are also a cause for concern in developing countries. Diseases of the circulatory system are also estimated to account for 20 per cent of total invalidity. These diseases and cancer are difficult and costly to treat. More emphasis is being placed on prevention through modification of individual behaviour. Cigarette smoking, through its relationship to heart disease, lung cancer, and chronic respiratory disease, is considered the most important preventable contributor to mortality in developed countries. The rapidly increasing number of older citizens in all countries will pressure health systems to provide a broader variety of care in hospitals, chronic care facilities, communities and homes, with the goal of enabling the elderly to stay healthy and remain at home or nearby.

265. Viral and bacterial epidemics are still a threat, especially in view of inadequate surveillance and preventive measures, and human disruptions of ecological factors. Acquired resistance and natural insensitivity of micro-organisms and other vectors to available drugs and pesticides have slowed progress in disease reduction and increased the cost of control. Biotechnology is being used to develop a new generation of vaccines and will no doubt be used to develop drugs that target specific organs and cells, reducing unwanted side-effects.

266. Acquired immunodeficiency syndrome (AIDS) and the entire spectrum of diseases associated with human immunodeficiency virus (HIV) infection have rapidly emerged as major global public health problems. By March 1988, more than 81,400 cases of AIDS had been officially reported in the world, but the actual number is estimated to be about 150,000. In addition, there is evidence of a pool of between 5 and 10 million infected but symptom-free carriers of the virus. The case fatality rate among those who develop symptoms appears to be high, but many essential epidemiological characteristics, including the natural history of asymptomatic infections have yet to be elucidated. The enormous cost of caring for AIDS patients threatens to divert resources [away] from other health programmes, with adverse consequences for overall health and mortality. Consequently, educational campaigns to prevent it from spreading are essential while the search for effective treatment continues. (The relationship of AIDS to drug abuse is discussed in sect. VI.C, below.)

267. Severe problems associated with cerebral disease or injury affect no less than 2 per cent of most populations, and neurotic and psycho-somatic disorders and alcohol- and drug-related problems affect 3 to 7 per cent. More effective methods of treatment to deal with alcohol and drug abuse prevention may, however, depend as much on the resolution of economic, social and political problems as on progress in medical technology. Severe mental disorders are also increasing with the aging of the population in most industrialized countries, and psycho-geriatric problems are claiming a significant share of resources for health care. World wide, it is estimated that between 340 million and 480 million people are disabled as a consequence of physical, mental or sensory impairment. To the extent that some of these problems may be genetic in origin, advances in genetic research may provide ways to prevent or cure them.

3. Nutrition, water supply and sanitation

268. Adequate nutrition, safe drinking water and adequate sanitation are vital for the prevention of serious disease and the maintenance of good health and high labour productivity. In most parts of the world, nutrition has improved over the past 25 years, as reflected in declining infant and child mortality rates and in declining percentages of the total population suffering from undernutrition (see table 40). But the improvements in child nutritional status in the 1970s ceased, on average, in the 1980s. 106/ Some 100 million children under the age of five show protein energy malnutrition; more than 10 million suffer from the severe form that is normally fatal if not treated. 107/ The estimated number of people suffering from severe undernutrition (with a basal metabolism rate (BMR) below 1.2) in 89 developing countries increased from 320 million around 1980 to 348 million

around 1984, and the number below 1.4 BMR increased from 475 to 512 million. (The basal metabolic rate is the energy needed under resting and fasting conditions. It varies with body weight and sex.) The proportion of the population that is undernourished fell in the early 1980s in South and South East Asia, West Asia, North Africa and Central America, but there was no improvement in South America. The proportion rose sharply in sub-Saharan Africa, which has suffered long-term declining food availability per capita and increased malnutrition, as economic stress and severe drought have contributed to the deterioration.

269. Assuming that the recent pattern of income distribution and food consumption in relation to per capita income continues, FAO estimates that the total number of people suffering acute malnutrition will increase slightly, to 353 million (in 89 developing countries) by the year 2000, and the number below 1.4 BMR will increase to 532 million (table 40). To reduce these numbers significantly, major improvements will be needed in the "system" of income and food distribution in many countries, as well as accelerated food production. 108/

270. The percentages of the population which have safe drinking water supply and adequate sanitation have increased considerably in many developing countries from 1975 to 1985, though variations in national interpretations of these concepts and changes in the number of countries reporting on them to the World Health Organization (WHO) limit the comparability of the data, both between countries and over time. In 1985, 75 per cent of the urban population in 89 developing countries and 42 per cent of the rural population in 91 countries had safe supplies of drinking water, compared with 74 per cent of the urban population (in 76 countries) and only 19 per cent of the rural population (in 69 countries) in 1975. 109/ Although the percentage served increased very little in the urban areas, the number of people served increased greatly, as a result of the rapid growth of total urban population, discussed earlier in section IV. The percentage of the urban population with adequate sanitation increased from 51 per cent in 60 countries in 1975 to 59 per cent in 77 countries in 1985. In the rural areas, the increase was from 11 to 15 per cent over the 10-year period. 110/

271. In 1985, the only groups of countries in which less than 70 per cent of the urban population had safe drinking water were the least developed countries (51 per cent) and South-East Asia (59 per cent) (see table 41). In contrast, less than 50 per cent of the rural population had safe water in all of the developing subregions, except West Asia and the Mediterranean. The percentage of the urban population with adequate sanitation in 1985 was more diverse, though the only groups averaging less than 55 per cent were South Asia (33 per cent) and the least developed countries (47 per cent), while the rural percentages were mostly between 15 and 30 per cent (see table 42).

Table 40. Estimates of undernutrition in 89 developing countries, 1970-2000

	1969-1971 a/	1979-1981 a/	1983-1985	2000
I. Below 1.2 BMR b/		Percentage of population		
89 countries	18.6	14.7	14.6	10.5
Africa (sub-Saharan)	23.5	21.9	26.0	20.3
North East/North Africa	15.7	6.7	5.6	4.6
Asia*	19.5	15.6	14.3	8.7
Latin America	12.7	9.8	9.5	8.0
		No. of persons (millions)		
89 countries	316	320	348	348
Africa (sub-Saharan)	63	78	105	137
North East/North Africa	28	16	15	18
Asia*	190	191	191	155
Latin America	35	35	37	43
II. Below 1.4 BMR b/		Percentage of population		
89 countries	27.0	21.8	21.5	15.6
Africa (sub-Saharan)	32.6	30.6	35.2	28.7
North East/North Africa	22.9	10.8	9.1	7.6
Asia*	28.7	23.5	21.8	13.9
Latin America	18.5	14.6	14.2	11.6
		No. of persons (millions)		
89 countries	460	475	512	532
Africa (sub-Saharan)	86	110	142	194
North East/North Africa	41	25	24	29
Asia*	281	288	291	246
Latin America	51	52	55	62

Source: FAO, Agriculture: Towards 2000, C/87/27, Rome, July 1987, table 3.4, p. 66.

* Excluding the planned economies, for which data were not available.

a/ The estimates for 1969-71 and 1979-81 are somewhat different from those of the Fifth World Food Survey because some smaller countries of the World Food Survey are not included here and because revised estimates of per caput food supplies for these years were used to compute them. These differences are, however, not significant.

b/ Basal metabolic rate.

Table 41. Percentage of population with safe drinking water, 1985-2000 a/

	Number of countries, 1985	population (millions)	1985 Urban	1985 Rural	1985 Total	1990 Total	2000 Total
Developing countries							
North Africa	3	50.7	94.0	39.2	64.2	66.0	70.1
Sub-Saharan Africa	34	345.1	75.8	23.7	35.6	35.5	36.9
South and East Asia	13	1 365.5	69.4	46.1	52.2	54.1	57.8
South Asia	5	993.1	74.3	46.9	53.5	55.4	59.1
South-East Asia	8	372.4	59.4	43.8	48.8	50.4	54.3
West Asia and Mediterranean	4	31.7	100.0	71.6	91.5	92.7	94.4
Western hemisphere	23	388.8	86.4	45.3	73.7	74.5	77.1
Total, developing countries	77	2 181.8	77.8	41.9	54.3	55.5	58.2
Least developed countries	25	309.1	50.6	33.7	36.3	36.3	36.5

Source: Department of International Economic and Social Affairs of the United Nations Secretariat, based on country data compiled by WHO as of May 1988.

a/ Country group figures are averages of individual country percentages weighted by urban, rural or total population.

Table 42. Percentage of population with adequate sanitation, 1985-2000 a/

Country group	Number of countries, 1985 population (millions)		1985 Urban	1985 Rural	1985 Total	1990 Total	2000 Total
Developing countries							
North Africa	2	28.8	81.2	35.3	56.4	57.8	61.5
Sub-Sanaran Africa	24	138.0	68.7	26.5	36.3	37.0	37.6
South and East Asia	13	1 365.5	44.4	13.4	21.6	23.4	27.3
South Asia	5	993.1	33.6	3.1	10.5	12.6	16.8
South-East Asia	8	372.4	66.2	44.0	51.1	52.1	55.5
West Asia and Mediterranean	4	31.7	99.2	30.8	78.8	81.5	85.5
Western hemisphere	22	388.8	79.2	15.5	59.4	61.2	65.3
Total, developing countries	65	1 952.5	61.4	15.1	31.6	33.5	37.5
Least developed countries	20	244.7	43.6	15.4	19.8	20.3	21.8

Source: Department of International Economic and Social Affairs of the United Nations Secretariat, based on country data compiled by WHO as at May 1988.

a/ Country group figures are averages of individual country percentages weighted by urban, rural or total population.

4. Access to health services

272. Access to health services in the developed countries has been largely complete for many years, and a few developing countries report 80 to 100 per cent coverage. Maternal and child health services have increased in most of the developing countries, but care for children under five years of age is still very limited. There has been some progress in the availability of treatment for common diseases and injuries and of essential drugs, but lack of resources and poor transportation and communications are still major obstacles in rural areas.

273. In all countries, demand for health services of greater complexity has increased. Overcrowded, costly hospitals in urban areas and poorly equipped intermediate health facilities are unable to satisfy the demand. Economically sound approaches are needed to clear this "bottle-neck" in the health care delivery system. Very few countries have incorporated health goals into their adjustment policies in order to minimise the impact of damage to health and to protect high-risk groups most vulnerable to the adverse effects of recent austerity measures. Increased access to food and primary health care is needed, especially for women and children, working populations at high risk and the poor and underprivileged.

274. Projections of life expectancy (shown in table 12 in sect. IV), indicate that current inequalities in the health situation of women as between developed and developing regions will remain largely unaltered by the year 2000. Policies to improve health care for women in developing countries, especially in the childhood and reproductive years, should remain a priority, especially in rural areas of developing regions where maternal mortality rates are highest. Medical examinations and basic medical care should be brought to the village, the school, the farm and other places of employment.

275. In 1977, the Thirtieth World Health Assembly decided that the main social goal of Governments and WHO in the coming decades should be the attainment by all the people of the world by the year 2000 of a level of health that would permit them to lead a socially and economically productive life. 111/ The key to attaining this goal is to provide primary health care, which is essential health care made accessible at a cost the country and community can afford, with methods that are practical, scientifically sound and socially acceptable. Everyone in the community should have access to it and be involved in it, including the health-related sectors. Primary health care should include education of the community on prevalent health problems and methods of preventing or controlling them; the

promotion of adequate food supplies, proper nutrition, sufficient safe water and basic sanitation, maternal and child health care, including family planning; the prevention and control of locally endemic diseases; immunisation against the main infectious diseases; appropriate treatment of common diseases and injuries; and the provision of essential drugs.

276. The mobilisation and management of financial resources for health have been identified by WHO as critical for achieving the long-term goal of "Health for All" by the year 2000 through primary health care. While financial cutbacks present major problems in the short run, in the long run, the search for additional and new resources, in particular, domestic resources, and making the most efficient use of all available resources, offer the best options for financing health for all. Even if health, broadly conceived, is accorded very high priority, national development planners must still try to estimate the relative effectiveness of alternative allocations of limited resources among investments in and operation of local clinics and other facilities for primary health care, high-technology hospitals, modern and traditional medical training, public health education, nutrition programmes, safe water supply and sanitation, shelter, etc. Focusing on specific goals and timetables, such as providing basic immunisation to all children by 1990, and reducing the infant mortality rate below 50 by the year 2000, helps to mobilise the necessary resources. 112/

277. WHO has estimated that primary health care could be provided in the developing countries for $10 to $15 per person per year. 113/ This is more than most Governments spent for health during the early 1980s (among the developing countries with data), especially in Africa and South and South-East Asia (see table 43). However, the total of governmental and private expenditures would be sufficient to provide primary health care in many countries (see table 44) if the services were provided (priced and distributed) more equitably than they are now. In the poorest countries - mainly in South Asia and sub-Saharan Africa - the total expenditure would have to increase by $5 or $10 per capita (roughly 3 to 4 per cent of GDP per capita), along with development of a wider delivery system to reach more of the rural and low-income urban population.

278. With the slowdown in economic growth in many developing countries in the 1980s, it has become apparent that very few countries will reach the ambitious target of 100 per cent coverage with water supply and sanitation originally set for the end of the International Drinking Water Supply and Sanitation Decade in 1990. Based on the cross-section relation between percentages served and per capita GDP in 1985, and on the baseline projections of GDP growth, there will be relatively small increases from 1985 to 1990 and 2000 in the percentages with safe water and adequate sanitation in most of the subregions (see tables 41 and 42). Additional increases of a few percentage points could be expected with the higher total investment assumed in the scenario for more rapid economic growth. But large increases in coverage will require an increase in the water supply and sanitation shares of total investment, or significant reduction in average unit costs, and increased efforts to raise sufficient revenues from taxes and user charges to cover the costs of construction, operation and maintenance. There has been significant growth in the number of countries with average tariffs equal to or higher than costs of production, but not in the poorer regions, including Africa and the least

Table 43. Government health expenditures per capita, in 1980 United States dollars (number of countries) a/

Country group	Total outlays 1980 All countries		Total outlays 1980 Countries with data for 1985		Total outlays 1985		Final consumption expenditure Number of countries	Final consumption expenditure 1970	Final consumption expenditure 1980	Final consumption expenditure 1985
Developing countries										
North Africa	18.57	(4)	10.55	(2)	13.03	(2)	(2)	9.49	29.86	30.07
Sub-Saharan Africa	5.63	(16)	8.09	(8)	7.76	(8)	(18)	6.53	6.70	7.18
South and East Asia	3.03	(10)	2.96	(9)	3.93	(9)	(9)	1.27	2.18	3.09
South Asia	2.16	(4)	2.16	(4)	3.13	(4)	(4)	1.01	1.52	2.41
East Asia newly-industrialized countries	7.75	(2)	7.75	(2)	10.39	(2)	(1)	0.62	3.11	2.98
Others	5.08	(4)	5.14	(3)	5.91	(3)	(4)	5.26	10.74	12.47
West Asia	118.10	(2)	118.10	(2)	151.39	(2)	(4)	14.79	48.41	45.41
Mediterranean	175.41	(2)	175.41	(2)	135.34	(2)	(3)	8.80	17.20	18.09
Western hemisphere	39.59	(8)	39.39	(3)	37.21	(3)	(8)	21.17	23.37	27.35
Subtotal, developing countries	8.70	(42)	7.39	(26)	7.63	(26)	(44)	3.78	6.73	7.75
Least developed countries	1.86	(13)	1.69	(7)	1.84	(7)	(12)	2.37	1.96	2.17
China	5.71	(1)			b/			b/	b/	b/
Developed market economies	594.24	(23)	594.24	(23)	609.21	(23)	(15)	268.60	452.25	501.80

Source: Department of International Economic and Social Affairs of the United Nations Secretariat, based on country data from United Nations Statistical Office, National Accounts Statistics data bank tables 2.1, 2.3, 2.5; IMF, Government Finance Statistics Yearbook 1987, p. 98, and World Bank, Financing Health Services in Developing Countries, Washington D.C., 1987, table 3, p. 16.

a/ Country group averages are weighted by population.

b/ No data reported.

Table 44. Government and private 1980 health expenditures per capita, in 1980 United States dollars (number of countries) a/

Country group	Government total outlays	Private expenditure b/
Developing countries		
North Africa	18.57 (4)	10.61 (2)
Sub-Saharan Africa	5.63 (16)	6.14 (16)
South and East Asia	3.03 (10)	8.05 (11)
South Asia	2.16 (4)	3.69 (3)
East Asia newly-industrialized countries	7.75 (2)	57.31 (3)
Others	5.08 (4)	12.05 (5)
West Asia	118.10 (2)	51.63 (2)
Mediterranean	175.41 (2)	59.42 (2)
Western hemisphere	39.59 (8)	54.35 (9)
Total, developing countries	8.70 (42)	13.99 (42)
Least developed countries	1.86 (13)	2.91 (10)
China	5.71 (1)	2.68 (1)
Developed market economies	594.24 (23)	354.21 (24)

Source: Department of International Economic and Social Affairs of the United Nations Secretariat, based on sources for table 43.

a/ Country group averages are weighted by population.

b/ Includes some expenditures by missions and non-governmental organizations, as well as private expenditures on health care, as estimated by the World Bank.

developed countries. The most serious constraints on meeting the goals of the decade in most regions were funding limitations and inadequate cost recovery frameworks, insufficient trained personnel, and unsatisfactory operation and maintenance. 114/

279. The cost of constructing facilities for safe drinking water and adequate sanitation for 100 per cent of the population by the year 2000 could be less than 1 per cent of annual GDP during the period from 1986 to 2000, under the baseline scenario, in most of the developing countries (1 to 2 per cent in sub-Saharan Africa), if available low-cost technologies are used, i.e., standpipes rather than individual house connections for water supply, and non-water-borne sanitation (privies, night-soil collection etc.). 115/ Water-borne sewage systems for urban areas would cost considerably more to construct, but might have lower costs for operation and maintenance.

280. In many countries, national health plans have been found to be too expensive to fund and implement. A greater mobilisation of domestic resources is possible: employers and employees could contribute to health insurance schemes; employers could provide health services directly; public or private institutions might be created to attract voluntary insurance contributions; other schemes of community financing might be developed; and consumers might be required to pay direct fees for some of the health services they use. Recent studies suggest that it would be both equitable and efficient to charge middle-income and upper-income groups for curative services, thus preventing excessive consumption of free services and allowing limited government funds to provide health care to more of the low-income population. Even if it is necessary to charge user fees to low-income groups, this can provide better health to more people than systems that rely on inadequate government funds. 116/

281. The recent rise in concern with cost-containment in many countries is likely to continue throughout the 1990s. Determining the appropriate mix of public and private services, providers and funding sources will call for considerable research and public policy debate. There is substantial room for improvement in the cost-efficient allocation of resources for drugs, surgery and other methods of health care. A strong case can also be made for a reorientation of health services towards primary health care and rural areas. 117/

C. Social policy

1. Broader participation

282. Judged by emerging trends, the fuller participation of all elements of society in defining and achieving the common goals of development, with full respect for fundamental freedoms, is likely to be a major issue for the balance of the century. The principle is embodied in all major international instruments and plans of action adopted under United Nations auspices in recent years.

283. Progress towards fuller participation can directly contribute to improving the situation both of disadvantaged groups and of society as a whole. It also has the potential of influencing economic performance, through its impact on motivation, innovation and productivity. Although this influence is essentially intangible and has mostly defied quantification, it is none the less real. Participation may be expected to have a generally positive impact on economic performance through increased motivation, by opening up opportunities for groups whose scope for engaging in productive activities tends to be artificially restricted, and by making fuller use of underused or latent skills and talents.

284. Of growing importance and interest are the continuing strength and proliferation of various co-operative, self-help and community groups and non-governmental organisations; and the increasingly organized articulation by various groups of their interests, reflected in their demands for a greater say in decisions affecting them. Numerous initiatives have been taken all over the world to give members a greater voice in the running of institutions. Such initiatives seek to give workers a greater role in the management of enterprises, to give greater autonomy to public enterprises in countries with centrally planned and mixed economies, to devolve power to local authorities, and to establish new forms of partnership between government and non-governmental organizations. The process of codifying rights has also gained momentum, in the adoption of a number of global instruments, relating, inter alia, to the advancement of women and the situation of specific groups of the population, in particular, youth, the aging, migrant workers and their families, disabled persons and those in detention or accused of crimes.

285. Of particular significance from the economic point of view are the expansion and diversification of the co-operative and other mutual self-help movements, the experiments to improve motivation and efficiency through greater decision-making autonomy and worker participation, greater participation of clients in the design and administration of more decentralised social services, and the reorientation of welfare services (as discussed in more detail below) towards mutual self-help, prevention, rehabilitation and income-generating activities for welfare service recipients, the latter being of special significance in developing countries.

2. Advancement of women

286. Progress towards achieving equality between the sexes is one of the most dramatic social changes of this century and the achievement of this equality is a world-wide goal, set in 1975 and reaffirmed in 1985 at the end of the United Nations Decade for Women. The Nairobi Forward-looking Strategies for the Advancement of Women 118/ foresee achievement of full equality by the year 2000. Although this ambitious target has strong implications for the future global economy and society, projecting its consequences requires particular care. The effect of a progressive elimination of inequalities, on which many social and economic relations are still based, may not be fully visible until well into the next century.

287. Between 1985 and 2000, the number of women in the world is expected to increase by some 635 million, from 2.4 billion to just over 3 billion with almost 80 per cent of them living in the developing regions. The proportion of women in the total population will fall slightly, from 49.7 per cent to 49.6 per cent, reflecting faster growth in population in the developing regions. With the exception of Africa, these regions will continue to have more men than women, especially in Latin America and East and South Asia, although the trend is towards parity. In South Asia, the projected ratio is 104.9 men to every 100 women by the year 2000. This contrasts with the developed regions, where the ratio of men to women was 94.2 in 1983 and is projected to rise slightly to 95.6 by the year 2000.

288. A likely effect of increased life expectancy for women in developing countries will be more women entering the formal labour force after their child-bearing years. How the economies will adjust to the large numbers of women wishing to enter the labour market will be a major issue. If current trends are not modified, projections indicate that the participation of women in the economically active population will decline, as discussed in section V. Throughout the world women make an important contribution to the economy, although many of their productive activities are not formally recognised. In addition to their presence in formal employment, women contribute significantly to the work of family farms and enterprises and of the informal sector, by providing "free" services that maintain and support current and future workers, services that would otherwise need to be provided by the State, or bought in the market. Increased productivity in all such activities can be a major source of increased well-being and economic growth. The entry of more women into formal and more skilled employment could improve their productivity and thereby national incomes.

289. An increase in the relative number of female workers is unlikely to influence male unemployment adversely. (There is no evidence that greater female participation has in the past been at the expense of male employment; employment trends for both sexes have tended to move in the same direction.) In the coming years, when the informal sector is expected to increase in importance, women are likely to be hired in jobs that men do not want, based on current preferences, because working hours are limited, or because the job offers a less secure link to the employing enterprise.

290. At the micro-economic and micro-social levels, women's participation in the economy is often the only way to protect the family in times of difficult economic conditions. Women's employment and the income derived from it maintains, and sometimes insures by itself, the standard of living of the family.

291. The number of women who are main economic earners has been increasing in the recent years and this evolution is likely to continue. The trend whereby women work in order to compensate for an otherwise declining standard of living can be expected to continue in the 1990s, especially in those developing countries where no significant increase in per capita income is anticipated. Women's participation is necessary for the economic survival of the family in the early stages of development; in economies characterised by family-based employment, women have higher rates of participation than in economies based on wage labour. Thus, as the development process modifies the structure of employment, women's participation appears as an important adjustment factor within the economy and the family. Even in developed economies, the role of women as secondary wage earners may be essential for the family, and this characteristic is likely to increase by the year 2000. In some countries, such as the United States of America, studies indicate that women's participation may be inversely related to husbands' wages. Thus, the wife takes a job in order to compensate for an insufficient or declining family income. Studies in other countries suggest that wives of men earning either very low or very high incomes had higher participation rates than wives of men earning middle incomes. These two interpretations of the relationship between female economic participation and the family, or the husband's income indicate that, in cases of economic difficulties, women are likely to increase their participation in the economy.

292. The participation of women in the economy is affected by relationships between education, health and fertility - all of which influence the incentive for a firm to hire a female worker - and her strategy in the labour market. These relationships are usually part of a vicious circle contributing to the exclusion of women from the formal economy. But a policy that targets each aspect of these relationships may generate a virtuous circle promoting better use of women's talents and energies. Specific policies are necessary to promote equal access by women to education, since current trends indicate that full equality in access to education will not be achieved by the year 2000 (see sect. VI.A. above). Policies to promote equal access to education are to be complemented by training policies targeting older age groups. The need to supplement formal education with training is also evident. The importance of the informal sector in women's employment means that those women who have not been able to benefit from education in the past should benefit from special programmes to enable them to function effectively in a modern economy.

293. Women's reproductive role should not be an obstacle to full economic participation. The development of better support systems in the 1990s could influence the environment in which women determine their strategy on the labour market and the terms on which women reconcile their responsibilities in the household as parents and as workers. In most of the world, women work within family enterprises, where social support and economic roles can be combined. Urbanization has reduced the significance of this type of socio-economic structure

in many countries, as the work-force in the formal sector increases. This trend can be expected to continue, and is one of the factors underlying the projections of reduced women's share in the work-force noted earlier. In order to overcome this effect in economic sectors where family enterprises do not exist, efforts can be made to create an environment in which parental and work responsibilities can be combined, by providing such services as day-care and parental leave. The incentives for an employer to hire a woman should not be lowered by measures which, though intended to favour women workers, may raise the costs they represent for a firm. Thus, parental leave is to be preferred to maternal leave, for example. The question of reconciling parental and work responsibilities can be addressed most easily in the context of more flexible attitudes to career patterns, which make allowances for further study, as well as family responsibilities, for both spouses.

294. To overcome past conditions, special programmes need to be organized to ensure that women who are in low-skill jobs, unemployed, or who stopped work in order to have children, can get special training. Women returnees, in particular, can be an asset to an employer, as they have acquired maturity, and certain skills. Their previous education represents an important investment by the society and needs to be used. If a woman decides to go back to work, support should therefore be available to her.

295. Policies in these areas will have a major bearing on the nature of the contribution that women will make to the economy and its overall impact in the future.

3. Trends in social welfare policy

296. The scope, complexity and costs of publicly sponsored social security and social welfare services and programmes have increased significantly in many parts of the world, although their scope and coverage remain limited in most developing countries. Social welfare concepts and practices have also been the object of considerable debate and rethinking in recent years.

297. Spending on a broadly defined category of social welfare programmes, including social security, has increased steadily in real terms since the late 1960s, typically at rates faster than economic growth or total government expenditure. By the mid-1980s, social welfare spending by central and local government together was the equivalent of about 14 per cent of total output in developed countries and about 6 per cent in a small sample of the developing countries, although only 3 per cent and 1.5 per cent for Africa and South and East Asia, respectively.

298. In the developed countries, social security and welfare services are recognized as essential elements in the social advances that have been made. However, their rapidly rising costs have been a cause of concern and, despite the resources they absorb, some have come under scrutiny for their alleged inefficiencies and failure to provide for those most in need. Expansion and increased costs are built into most systems, while budgets are likely to continue to be restricted by slow economic growth. Administrative complexity pushes up delivery costs. Services are labour intensive, and increased professionalism and

training escalate unit costs. Increasing numbers of middle class people use services, especially in a period of slow growth in personal income. Changing age structures, in particular the aging of the population, add a new element, which will be progressively more significant. While the increased costs associated with an aging population may be offset by savings in maternity, child and youth services, this will require a major redirection of resources and retraining of personnel. Partly inspired by the drive to greater economy, but reflecting also changes in professional views as to the most appropriate forms in which care is to be provided, institutionalisation of people who cannot support themselves is being de-emphasized in favour of community-based and family-based support. Perhaps the most significant trend is greater prominence for prevention and rehabilitation, to enhance people's capacity to function independently, effectively and productively.

299. In many developing countries, the need for social welfare services is increasing with the spread of urbanisation, migration, changing family and kinship support systems, and greater female participation in the modern economy. But as recession and economic decline in some areas are placing greater demands on the typically limited capacity of existing public systems, Governments are seeking ways to maintain existing family support systems. Social welfare programmes are increasingly taking on a developmental character, with an emphasis on creating income-earning opportunities for the poor, vulnerable, dependent or disabled. Even limited resources can have significant economic benefits if used for prevention, maternal and infant care, immunization against childhood diseases, and supplementary feeding for pre-school and school-children, as well as some rural community services. To replicate such programmes in large numbers would require a redirection of resources from urban, often middle-class oriented services, with all that this implies.

4. The family

300. The family as a basic social unit has undergone profound change, but with no uniform pattern. From an economic perspective, the most important changes are those related to family formation and fertility, the family as a system of support and the supporting services that families increasingly need in order to function effectively in a changing environment. In developing countries, the role of the family as a production unit and source of employment continues to be of major, though diminishing, importance.

301. The extent to which the family, nuclear or extended, has been eroded as an effective social support system is the subject of considerable debate. Lack of precise information on the actual support rendered for family members to each other tends to make the discussion conjectural. It is probably safe to say that in the developed countries the family as a support institution has not been eroded as much as is commonly supposed, whereas in developing countries, the stereotype of the self-sufficient family is no longer an entirely accurate reflection of reality. In the areas of education and health, families are probably making a greater contribution than at any previous time, although family members receive a greater proportion of their total education and health services ouside of the family.

302. Recent trends suggest that pressure will continue for families to rely more on external support, much of it provided by public authorities in the form of specialized services and care, in particular, in developed countries. In developing countries, too, as parents are less able to prepare their children for a world outside their realm of experience, families may need outside support, especially in finding suitable employment for the next generation. In many countries, there are growing demands for additional services and support that would better enable parents, especially mothers, to reconcile parental, household and work responsibilities. This will be a major issue in developed countries and will become increasingly relevant in developing countries as fewer women will earn a living from home-based employment. At the same time, however, restraints on the financial and administrative resources of Governments, and on the availability of adequately trained child-care workers, will limit the ability of Governments to provide adequate child-care for all young children. New arrangements, including participation by employers, primary schools and other existing institutions will be needed. In some cases, it may be more efficient and socially beneficial for Governments to provide direct income supplements to enable parents to spend more time caring for their children in their own homes, or in various co-operative arrangements with neighbours or relatives.

303. In both developed and developing countries, in a period of budgetary constraints, Governments have looked with renewed interest at the family as a system of support that could bear a larger share of the burden of looking after the sick, the disabled and the aged. The professional view supports such arrangements as being in many cases preferable to institutionalization, and recommends public support and assistance to encourage families to provide more such support. However, the burden of care now tends to fall disproportionately on women. There is thus a potential conflict between this trend and the goal of widening opportunities for women, especially in education and employment.

5. Trends in the situation of specific groups of the population

304. The forthcoming decade will witness an acceleration of population aging, as discussed earlier in section IV. The global population aged 60 and above will total 485 million in 1990 and increase to approximately 610 million in the year 2000 (and to 755 million in 2010 and 1,170 million in 2025). The growth of the population aged 80 and above will be even more rapid, and women will comprise the majority of this group. Many more elderly will be living in urban areas, although, in developing countries, the majority of the elderly will still be residing in rural areas. The roles of the public and private sectors in caring for the elderly, traditionally done by the family and the local community, will probably have to increase. This support will be particularly needed in the rural areas of developing countries in view of the rural to urban exodus of the young and the consequent "aging" of these areas. Rural development strategies aimed at providing employment opportunities for aging men and women, and at strengthening family and community solidarity, would go far in securing the well-being of this large segment of the world's elderly population.

305. In many industrialised countries, social expenditures incurred by the aging of populations are high and rising. The provision of income security and health care will pose a challenge to both the public and private sectors well into the next century. Mitigating actions could include efforts to raise national saving and investment rates, collection of higher contributions from workers and employers, reduction of benefits, and introduction of complementary public and private pension systems. 119/ Flexibility of retirement age may also be considered, but early retirement as a means of opening up employment opportunities for the young - a trend observed in several countries - may aggravate the financial and social problems of the elderly. The provision of more genuine choices for older workers in several European countries could help in ensuring the participation of the able elderly in the economic and social life of their countries. 120/

306. The elderly are occupying an increasing proportion of general hospital beds, with wide variations between quality of care and length of stay from country to country and within countries. Unnecessarily long periods and high costs of hospitalisation could be reduced by better management and the establishment of broader-based community support. Geriatric training and institutions that provide long-term care for the frail, dependent elderly are inadequate in most countries and urgently need to be improved, in anticipation of the rapid expansion of this population group. To contain health care costs in the years ahead and to ensure that the task of providing care for the frail elderly is not unduly left to any one sector or group, a broader system of geriatric care is required - one that incorporates provisions for the care of acute and chronic illnesses, training, community support and service delivery, with collaboration of national and local governments, professional and voluntary organizations, the family and the elderly themselves.

307. The ages of 15 to 24 are critical, when young people are integrated in their communities. In times of rapid social and economic change, family bonds weaken as the traditional values of parents seem less relevant to the problems of the young. Employment opportunities are critical for the absorption of the next generation. Where generations of young men and women come to maturity without opportunities to work and make reasonable lives for themselves, there is bound to be a seething pool of discontent among energetic and talented young people in search of a cause to which they can apply their talents. A particularly daunting prospect is that the majority of the youth of today facing limited employment opportunities will be parents in the year 2000, with only a tenuous hold on the economic ladder.

308. Suitable training, in and out of school, and provision of initial employment opportunities, are critical. In many countries, the past 10 years have been particularly difficult for youth employment, as a growing youth cohort coincided with recession, slow economic growth and economic restructuring. Although the youth cohort is already declining, and will be considerably smaller in the 1990s, thereby reducing the likely levels of youth unemployment, youth with low skills will have increasing difficulty finding entry-level jobs. In most developing countries, many young people find only a series of casual jobs, often in the informal sector. There is in many countries a serious mismatch between the skills acquired in school and the needs of employers: young people without skills face a particularly bleak future, especially in urban areas.

309. Youth unemployment in most developing countries can be tackled effectively only in a context of more vigorous economic growth. At the same time, public and private programmes can be geared towards making youth employable. The most critical needs are faced by rural youth. There is a general lack of basic amenities in rural areas, with few organisations specifically for young people, contradictions between aspirations and traditional values and systems, and often limited access to land. Efforts directed at improving rural conditions in general, with special emphasis on rural youth, can be an important element in slowing down migration to urban areas and providing greater opportunities for youth in general.

310. The economic as well as human costs, of disability are very large. While there is no single, precise estimate of the number of disabled persons, a conservative estimate puts the global number of persons suffering from all types of disability at over 500 million. Even relatively minor types of disability are closely associated with the incidence of poverty in many developing countries. Prevention and rehabilitation are potentially major areas that can yield both social and economic benefits.

311. Despite strained economic circumstances, there is increasing political commitment on the part of Governments to the prevention of disability, and to the rehabilitation and equalisation of opportunities for disabled persons, frequently contained in legislative measures or constitutional clauses. Because disability can affect all aspects of life, it must be subsumed in the larger questions of infrastructure and the purposes and goals of national development. Policies at all levels aimed at dealing with disability issues should, therefore, be an integral part of the larger efforts aimed at promoting a better life for all. These policies should form an integral part of the overall developmental efforts of each country and should be considered as enhancing the overall productive capacity of a society.

312. Financial limitations and the need for trained human resources in the disability field have been identified as the two major obstacles in implementing the goals of the World Programme of Action Concerning Disabled Persons (see General Assembly resolution 37/52 of 3 December 1982). With lack of expertise identified as the second greatest obstacle in implementing disability programmes, training and education have been identified by a large proportion of developing and least developed countries as a priority in future technical assistance programmes.

313. In both the developed and developing world, mental illness has reportedly been increasing. Since the mentally ill and mentally retarded are among those receiving the least coverage in vocational training schemes and rehabilitation services, especially in the least developed countries, a concerted research effort, as well as increased provisions of treatment, are urgently called for.

314. The World Programme of Action Concerning Disabled Persons recommends the integration of mentally retarded and other severely disabled children into the general school system. Special attention needs to be drawn to this problem, in the light of the discovery that over 70 per cent of countries at all stages of development and in all regions report that they may exclude certain categories of disabled children from the school system.

315. It should be recognised that the vast majority of the world's disabled persons live under conditions of deprivation, without access to social assistance, especially where the infrastructural conditions are rudimentary. The extension of social security on a universal basis would be an important step towards alleviating the problems of disabled persons since, today, such universal coverage is largely concentrated among developed countries.

316. The effectiveness of community-based rehabilitation requires a network of community services, as well as specialised referral services. Concerted efforts appear to be essential in this area, if a strategy of community-based rehabilitation is to be successful in offering the services required by many disabled persons.

317. Integration of disabled persons within the community also requires access to public buildings and transportation. While living conditions in countries that are still largely rural may not immediately demand the same measures to improve accessibility required by more urbanised countries, it is none the less important that appropriate legislation evolve in view of anticipated needs.

318. Research capacity in the area of disability is unevenly distributed among countries. There is a need, expressed by many countries, to enhance such research capacity. It may be possible to accelerate research, and to save resources as well, if the augmentation for a national research capacity were to be accompanied by regional co-operation through region-based disability research institutes.

6. Crime

319. The direct and indirect costs of crime in terms of human, social and economic losses seriously distort development priorities and goals. Expenditures on the maintenance of law and order divert funds urgently needed in other sectors, and are a heavy burden on national budgets. The problems encountered include the emergence of sophisticated forms of crime, which are new to many countries that lack the experience and resources to respond adequately.

320. There have been attempts to put a money cost on the traditional types of crime for many years now, but there are almost as many different outcomes as there are attempts. There is much more agreement that the really important costs of crime are to the quality of life, in incapacitated and frightened victims, restriction of movement, and so on, but that these costs cannot be linked directly to the national economic situation. The remedy that has gained much support in recent years is that of victim support schemes. The cost of such schemes is small compared with other costs of crime and crime control.

321. The relationship between the advance of technology, and other aspects of economic development, and the rate and type of criminal activity can be measured somewhat more precisely, but still leaves a lot to guesswork. It is widely believed by criminal justice officials and research criminologists that the link between "organised crime" and legitimate business is growing stronger. The use of telecommunications makes it possible, even easy, to carry out fraud and embezzlement over a wider geographical area and on a much bigger scale.

322. National economies are likely to suffer increasingly from the costs and effects of conventional crime, the growth of organised crime, including the use of legitimate or quasi-legitimate organisational techniques and structures for illegal economic gain and from the costs of attempting to control crime. Based on the findings of the first and second United Nations Survey(s) of Crime Trends, Operation of Criminal Justice Systems and Crime Preservation Strategies, projections of recent trends suggest that criminal justice systems are a major growth industry. For every 100 recorded crimes in 1975, there would be 160 in the year 2000; for every 100 police officers there would be over 170; and for every 100 adults in prison, there would be over 200.

323. It may be that economic growth will bring some increase in at least some types of crime, while there will be a decrease in others. However, the types likely to increase are those that are most likely to be reported, so that an increase in recorded criminality could well accompany a decrease in unrecorded traditional criminality. However, unrecorded crime is likely to continue to grow, rather than decrease in respect of economic crime. The broad category of different techniques involving technology for the non-violent but illegal acquisition and use of money seem likely to grow considerably; it will directly affect the economy of some, perhaps many, countries. Many practitioners and policy makers in the field of criminal justice believe that the most effective tool for the prevention and control of such activities is the forfeiture or freezing of assets; for that to be widely practised, the co-operation of the banking industry is needed, including less secrecy.

324. These are projections and not forecasts. However, they do show that a huge increase in the demands made upon the national economy by the criminal justice system is, at least, highly likely, and perhaps inevitable in many countries. An even more alarming feature is that the fastest-rising number is that of adults in prison, because prison is a very expensive institution in any country. If that number continues to rise at the 1975-1980 rate, the cost of the prison service alone will make the criminal justice system a major component in the budget of the national public sector. Further, there are good reasons to believe that the numbers will actually rise faster because, on the one hand, more police officers are being recruited, leading to more arrests, and on the other, there is evidence that the courts in many countries are handing down longer sentences, as they perceive themselves faced with a rising crime wave. The self-amplifying nature of this phenomenon is particularly worrying, in that the larger police-force "creates" the impression of a larger crime problem by arresting more suspects. It is thus extremely difficult to determine how much of the increase is genuine, and how much is the result of policies adopted in the different criminal justice agencies. However, in this context, that is not the important issue; what is, is that the impact on the national budget will continue to increase. One alternative strategy for a national administration is to allow the continued strengthening of the "intake" end of the system, the police, but not to expand the capacity for disposal after trial. That results in over-crowded prisons, which both offend [against] generally accepted standards of human rights and are widely thought to be themselves criminogenic.

325. In summary, the rising levels of recorded crime and of state responses to it can be expected to have a significant and deleterious effect on many national economies by the year 2000. The harm done to individual victims may not be easily quantifiable in economic terms, but organised crime - and with it a threat to legitimate business practices - seems likely to grow, and finally, the rising cost of criminal justice will compel the diversion of resources from more popular and desirable components of the public sector.

7. Drug abuse

326. Problems stemming from drug abuse and illicit trafficking have been growing at an alarming rate over the past 20 years. During this period, the abuse of narcotic drugs and psychotropic substances has increasingly spread throughout the world, primarily among the young, crossing all social, economic, political and national boundaries. While the extent of drug abuse varies from country to country and from one population group to another within the same country, abuse has spread to countries and population groups that had not previously been involved, and has increased further in those population groups where it already existed. The spread reflects expanded illicit production and distribution. These trends are most likely to continue, and given the known consequences of drug abuse, to have significant adverse effects on public health and general, social and economic conditions throughout the 1990s.

327. Drug abuse severely affects normal social functioning, intelligent and responsible behaviour and the ability and motivation to engage in the complex tasks required in modern societies. Heavy drug abusers show very pronounced tendencies towards inactivity, apathy and self-neglect. Loss of interest in conventional goals and lethargy lead to decreased productivity at school and at work. In addition to the costs of drug-related crimes and incarcerations, heavy costs are inflicted on national economies by disabilities, absenteeism, accidents and deaths due to drug abuse. 121/

328. Forms of drug abuse are becoming increasingly complex: abuse involving two or more substances is widespread and has become the predominant pattern in a number of countries. The age of first drug use is falling from adolescence to preadolescence and even earlier in some countries. In the 1980s, there has been an alarming increase in the spread of AIDS and certain other viral infections, which are spreading to abusers that inject drugs and, subsequently, from abusers to the general population through such modes as sexual intercourse. It is most likely that societies will be faced with increasing demands for resources to cope with the problems related to AIDS, including more effective programmes designed to prevent the transmission of the virus through drug abuse. This will require more intensive search for effective methods of prevention and treatment, as well as broader implementation of such measures. At present, methadone maintenance has, in some instances, shown useful results in the process of treatment for opiate-addicted persons. The usefulness of some other alternative programmes, such as free distribution of sterilised needles and syringes, is being explored. In addition, educational and other preventive programmes, designed to meet the needs of various target groups, should be provided in all social settings.

329. To cope effectively with drug abuse problems in the years to come, prevention and treatment of a both traditional and novel form will be required. In order to cope effectively with drug abuse problems in the years to come, it is likely that, in addition to promoting traditional preventive and treatment services, societies will make increasing efforts to:

(a) Promote broadly-based educational programmes, in natural social settings, to help individuals at risk both to acquire the necessary knowledge and confidence to resist the temptation to use illicit drugs, and to increase their ability to cope with the day-to-day problems of living;

(b) Promote after-care and social reintegration, especially with a view to reducing relapse rates after completion of treatment and rehabilitation, by involving the family, the local community and other appropriate forms of social support, in addition to the traditional services;

(c) Achieve both a positive community response to drug-related problems and community involvement in providing readily available preventive and treatment services at as low a cost as possible;

(d) Promote the participation of youth in preventive programmes and encourage the creation of conditions in which young people can find scope for their capacities for social integration and receive due recognition and support for their activities.

330. The illicit supply and trafficking of drugs have also increased at an alarming rate in most parts of the world over the past 20 years. The illicit cultivation of narcotic plants has grown to enormous proportions in certain areas of the world. Narcotic drugs and psychotropic substances are increasingly produced by illicit laboratories. Diversion from legal sources into illicit channels adds considerably to the problem of illicit supply of drugs. While strong law enforcement and advanced technology may greatly improve a nation's ability to destroy illicit crops, production in some areas is likely to continue unless reasonable economic alternatives are offered to those involved. Reducing the economic incentive to grow illicit crops, as part of the long-term goal of eradicating illicit production, has increased in strategic importance over the past decade. Future efforts will require increased technical and financial resources for this purpose.

331. Illicit drug trafficking has become very sophisticated and complex, involving organized crime in a variety of illegal activities, including conspiracy, bribery, intimidation and corruption of public servants, tax evasion, banking law violations, racketeering, illegal money transfers, import/export violations, smuggling of weapons, crime of violence and terrorism. Drug-related problems thus directly affect social stability and public safety and are associated with social disintegration.

332. Emphasis should be placed on supplementing the activities of police and customs authorities by increasing the efficiency of the criminal justice system in arresting, prosecuting and sentencing traffickers. This process includes the strengthening of legal tools to ensure appropriate penalties. Experience in

various parts of the world has shown that an effective countermeasure to deter the individuals involved in drug trafficking from continuing their operations is to deprive them of their profits.

333. A number of Governments have initiated vigorous and innovative methods for disrupting drug trafficking networks. These methods and experience in using them should be shared with other Governments. Since, in many cases of drug trafficking, it is necessary to look for evidence in countries or territories other than that where the accused individual has been brought to trial, international co-operation is essential to ensure the effective prosecution of such individuals and the removal of their illegally gained profits. An important action being taken by the international community in this regard is the drafting of a new United Nations convention against illicit traffic in narcotic drugs and psychotropic substances, which will deal with those aspects of the problem not covered in existing international drug control treaties. The international drug control system will presumably thus be strengthened to cope better with the drug abuse challenge in the year 2000.

334. The commitment of the international community to strive for the universal accession to the international drug control treaties and their strict implementation is expected to intensify co-operation through the United Nations and to strengthen national actions to cope more effectively with drug abuse and associated problems. The Comprehensive Multidisciplinary Outline of Future Activities in Drug Abuse Control, adopted at the 1987 International Conference on Drug Abuse and Illicit Trafficking, 122/ provides a basis for strengthening the international drug control system to cope better with the drug abuse challenge by the year 2000.

VII. STRUCTURAL AND TECHNOLOGICAL CHANGE

A. Structural trends in world production and trade

335. The process of economic growth is rarely smooth and painless. As new ways of doing things displace old ways, societies inevitably change. At times the consequences may be harsh, as when whole communities are abandoned in response to the emergence of new centres of industry and trade, sometimes in other countries. At earlier stages of development, the rising prominence of industry and trade and the ensuing migration from rural to urban centres bring important changes in ways of life and work, and political systems will be strained by shifts in economic power. In older industrial societies, the decline of industries which have been the mainstay of communities and regions for decades produces acute social problems.

336. Structural change is a necessary consequence of growth and development, which creates new consumer products and new life-styles while, at the same time, the demand for traditional necessities such as food becomes satiated. Thus, agriculture now occupies less than 5 per cent of the labour force in developed countries, while it still engages two thirds of the labour force in the least developed countries.

337. While structural change has thus been a natural accompaniment of the growth process over the recent decades, there is reason to believe that in the last 20 years world-wide structural change has been more pervasive than before. The industrialisation in developing countries is spreading quite rapidly, and in the old industrialised countries the problems of structural change have been on the agenda for years and are now beginning to be overcome.

338. Among the most important changes now taking place in the world economy is the ongoing transformation of its pattern of production, associated with long-term economic growth and greater participation by national economies in the global division of labour. This process of structural transformation is reflected in continuing shifts in the composition of output and productive resources from industry to services in mature economies and from agriculture to other kinds of economic activity in developing economies.

339. The shares of North America and Western Europe in total world GDP fell between 1970 and 1985, while those of Japan, China and the developing countries of South and East Asia increased. Changes in shares reflect persistent differences in GDP growth rates, the determinants of which were discussed in section III. The countries of Asia which exhibited rapid growth fall into two groups. The first includes very large countries such as India and China, which possess large internal markets and managed to increase investment shares without offsetting declines in the efficiency of capital. Another group, including Japan during part of the period and the newly-industrialized countries, promoted the rapid growth of their export industries. This led to high levels of investment and the rapid development of industrial capacity unconstrained by the size of the domestic market.

340. The composition of output by industrial origin has also changed considerably during the 1970s and 1980s. For world market economies as a whole, when measured at 1980 constant prices, 123/ the share of services in GDP increased by about 4 per cent between 1970 and 1985, while agriculture and industry (including mining) declined. The share of manufacturing fluctuated but exhibited no clear trend.

341. A similar pattern can be seen in the developed market economies as a whole, but significant differences can be seen among regions. In Europe, for example, there was little change in the share of agriculture in GDP. In the same region, the share of manufacturing in GDP declined noticeably, whereas in other developed countries, a region which includes Japan, it increased from 25 to 31 per cent. These shifts reflect evolving patterns of demand and productivity trends in the developed market economies, but also the relocation of a significant portion of manufacturing capacity from developed market economies to developing countries.

342. The extent of structural change among country groups has been uneven, as may be seen in table 45, and there is considerable potential for further industrial growth as evidenced in the large remaining share of agriculture in the output of the developing countries. Reflecting this transformation of economic structure, marked changes can be expected to occur in the composition of production in all groups of countries over the period to the end of the century, particularly in the developing countries.

Table 45. Sectoral origin and labour force orientation of world market economy production: historical and projected under a baseline scenario, 1970-2000

(Percentage shares in gross domestic product) a/

Year and country group	Composition of gross domestic product: Agriculture	Industry: Total	Industry: Manufactures	Services	Gross domestic product	Labour force participation rate b/
1970						
World market	7.4	40.6	24.5	52.0	100	39.7
Developed market	4.6	41.0	26.2	54.4	100	43.3
Developing countries	20.2	41.8	14.9	38.0	100	37.5
Petroleum exporters	13.5	56.0	8.1	30.5	100	34.3
Major mfg exporters	25.1	30.8	21.5	44.1	100	39.1
Other mfg oriented	16.0	34.4	23.1	49.6	100	35.0
Least developed	55.5	14.2	8.4	30.3	100	40.7
Primary commodity and services exporters	29.3	27.2	11.3	43.5	100	40.0
1985						
World market	6.2	37.7	24.8	56.1	100	39.8
Developed market	3.9	38.0	26.1	58.1	100	46.1
Developing countries	16.0	36.3	18.1	47.7	100	37.0
Petroleum exporters	11.3	42.7	12.6	45.9	100	34.7
Major mfg exporters	16.5	35.2	25.8	48.3	100	38.7
Other mfg oriented	14.5	34.6	22.7	51.0	100	36.1
Least developed	45.0	15.8	8.2	39.2	100	37.8
Primary commodity and services exporters	23.5	29.2	12.9	47.3	100	37.7
2000						
World market	5.6	37.8	24.9	56.6	100	40.0
Developed market	3.4	37.1	25.4	59.5	100	46.3
Developing countries	13.3	40.0	21.9	46.7	100	37.9
Petroleum exporters	9.8	45.0	13.4	45.2	100	36.0
Major mfg exporters	11.8	42.0	31.6	46.2	100	40.2
Other mfg oriented	13.0	36.6	24.1	50.3	100	38.3
Least developed	37.5	17.7	9.6	44.8	100	36.9
Primary commodity and services exporters	24.2	30.9	14.1	44.9	100	36.0

Source: Department of International Economic and Social Affairs of the United Nations Secretariat.

a/ Measured in 1980 prices and exchange rates.

b/ Labour force as percentage of total population.

343. For world market economies as a whole, growth in services and manufactures is expected to be more rapid than that of agriculture and other industry. The consequent change in the distribution of output by industrial origin is most noticeable in the case of agriculture, the share of which in gross domestic product is expected to decline to 5.6 per cent in the year 2000 compared with 7.4 per cent in 1970 and 6.2 per cent in 1985 (table 45). The figures for the world market economies as a whole conceal opposing trends in the developed market economies and in the developing countries. In the former, the shares of agriculture, manufacturing and other industry all decline, while that of services increases considerably more than the average for world market economies. In the developing countries, on the other hand, the shares of agriculture and services are projected to fall while those of manufacturing and other industry are both projected to rise. 124/

344. The pattern of world production as projected under the baseline scenario indicates marked differences in structures of production in different groups of developing countries. Over the last 15 years, manufacturing output and exports have been growing rapidly in the group of major developing country exporters of manufactures centred in South and East Asia. Corresponding to this shift in the proportion of manufactures in total production was a shift in the proportion of gross value-added originating in the manufacturing sector. The baseline scenario indicates that, should world economic growth continue at the modest rates now expected, this group of countries will none the less have a share of manufacturing in GDP significantly greater than that projected for the developed market economies. A similar shift, but at a slower pace and often towards domestic sales rather than exports, may be expected in other manufacturing-oriented developing countries. In North Africa and Western Asia, manufacturing activities associated with the processing of petroleum rose significantly in the last 15 years and may be expected to continue to increase in the future, with exports serving as the main source of demand for industrial expansion.

345. Measured by the changing proportions of output originating in the major economic sectors, the process of structural change was slow or non-existent in many low income and least developed countries. A sharp decline in the importance of the agriculture sector, similar to that which occurred in other developing countries, was expected in the 1970s and early 1980s as a natural consequence of the development of these countries. Instead, the share of agriculture remained unchanged, and there is no noticeable increase in the importance of the manufacturing sector. Moreover, in many countries where the share of agriculture has declined somewhat, this has been attributable to deteriorating agricultural performance rather than the successful development of industry and manufacturing. In other countries, the service sector accounts for much of the perceived change in economic structure, and the commodity-producing sectors achieved little positive structural change in the form of improvements to the organization, techniques and basic facilities underlying the production of commodity goods and basic services. Looking to the year 2000, under baseline conditions the economic structure of these countries presents a picture of slow structural change with a pattern of production significantly different from that of other regions of the world.

346. Past, present and projected baseline distributions of global output by different types of economic activities are summarized in table 46. The nature and extent of change in the origin of world production varies from region to region, but certain trends stand out.

347. The relative share of the developing countries in world output in all major sectors of production has risen noticeably over the last 15 years and may be expected to continue to do so. This increase in the weight of developing countries as a group, however, masks divergent trends within the total for this group, with large gains registered in the more manufacturing-oriented economies of Latin America and South and East Asia and little change or setbacks occurring elsewhere. The complementarity of production between primary production in developing countries and secondary production in developed countries has been changing continuously, thus changing the nature of interdependence between the two groups.

348. As in the case of changes in the composition of economic activity occurring within different groups of developing countries, there are marked differences in the extent and nature of shifts in the origin of gross world production. Many of these shifts are consistent with expectations mentioned above about the likely change in the distribution of world output. For example, a massive nominal shift in the origin of income generated in the mining and quarrying sector - from the major industrial economies of the North to the petroleum-exporting developing economies - occurred during the period from 1970 to 1985. Similarly, although the major developing exporters of manufactures account for only a small fraction of gross world product, they increased their share of world manufacturing product significantly over the decade and a half studied here; moreover, their economic expansion was not limited to manufacturing but encompassed all lines of activity except mining and quarrying. For these two groups of developing countries, and for other high and medium-income developing countries, the projections indicate a continuing shift in the locus of production from the more mature economies in the North to many rapidly growing developing countries.

349. No increase may be expected, however, in the proportion of world output originating in many low-income and least developed economies of sub-Saharan Africa and South Asia under the baseline assumptions. Many of these economies grew slowly over the historical period reviewed here and, as mentioned above, experienced little positive structural change. Baseline trends projected out to the year 2000 indicate that agriculture will continue to be the preponderant source of income and employment in many of these countries, and the slow growth of this sector may be expected to be translated into slow growth for the economy as a whole. Consequently, the share of these economies in the output of all categories of world production may be expected to decline or remain stable over the period to the end of the century.

Table 46. Geographic distribution of world market economy production, labour force and population: historical and projected under a baseline scenario, 1970-2000

(Percentage shares in gross domestic product and corresponding labour force and population totals) a/

Year and country group	Share in gross world market sectoral product				Share in total world market economy	
	Agriculture	Industry	Services	Domestic product	Labour force	Population
1970						
World market	100	100	100	100	100	100
Developed market	48	81	86	82	32	29
Developing countries	52	19	14	18	68	71
North Africa	2.0	2.2	0.5	1.3	1.9	2.9
Sub-Sahara	12.7	1.5	1.4	2.2	12.8	11.2
Western hemisphere	11.0	6.9	7.1	7.3	9.2	11.3
West Asia	3.4	5.3	1.0	2.9	1.5	2.2
South and East Asia	20.1	2.6	2.8	3.9	40.3	41.2
Mediterranean	3.2	1.0	0.9	1.0	2.7	2.4
1985						
World market	100	100	100	100	100	100
Developed market	45	80	82	79	28	24
Developing countries	55	20	18	21	72	76
North Africa	2.2	1.8	1.0	1.4	2.2	3.2
Sub-Sahara	9.7	1.6	1.5	1.9	13.8	13.2
Western hemisphere	12.9	7.2	7.4	7.8	10.6	12.2
West Asia	3.7	3.2	2.5	2.8	2.0	2.7
South and East Asia	23.3	5.0	4.4	5.8	40.9	42.9
Mediterranean	3.7	1.5	1.1	1.4	2.5	2.3
2000						
World market	100	100	100	100	100	100
Developed market	41	74	79	74	24	20
Developing countries	59	26	21	26	76	80
North Africa	2.2	2.9	1.3	2.0	2.6	3.4
Sub-Sahara	10.3	2.3	1.7	2.3	15.5	16.4
Western hemisphere	12.7	7.4	7.5	7.9	11.5	12.7
West Asia	3.8	4.5	3.5	3.9	2.5	3.3
South and East Asia	26.3	7.6	6.2	7.9	42.2	42.8
Mediterranean	3.6	1.7	1.3	1.6	2.5	2.2

Source: Department of International Economic and Social Affairs of the United Nations Secretariat.

a/ Measured in 1980 prices and exchange rates.

350. Structural change has been particularly evident in world trade. The average number of products exported by developing countries has steadily increased, and trade concentration ratios have fallen. At the same time, the importance of trade relative to GDP has increased over the past two decades in nearly all world regions. For the market economies as a whole, the value of exports relative to GDP increased from 12 per cent in the early 1960s to 21 per cent in 1980. The increase was more dramatic for the developing countries, especially the major exporters of manufactures, where the indicator increased from 13 per cent in 1960 to 32 per cent in 1982. The only group showing little change was that of the least developed countries. 125/

351. There have also been systematic trends in the shares of different regions in world exports. These shifts reflect the changing pattern of final demand in the developed market economies, changes in relative prices, changes in technology which have reduced the raw material content and energy-intensity of production, and shifts in the location of industrial production arising, in part, from the activities of transnational corporations.

352. The salient trends are the following. The share of the developing countries in world exports of manufactures more than doubled between 1970 and 1985, to reach 14 per cent. The share of OPEC in world exports of fuels increased from 54 per cent in 1970 to 64 per cent in 1975, but fell to 40 per cent by 1985 owing to the increase in production and exports of non-OPEC countries. In the case of food items and ores and metals, the shares of developing countries in world exports appear to have declined between 1970 and 1975 but recovered between 1975 and 1985. In the case of agricultural raw materials, the share of developing countries in world exports declined between 1970 and 1975 and remained low in 1985. Trade among developing countries increased markedly, from 20 per cent of their total exports in 1970 to 30 per cent in 1985.

353. Technological developments, some of which are described more fully in the next section, have contributed to the changes in the sectoral composition of output and trade in numerous ways. They have done so, for instance, by increasing productivity in the goods-producing sectors, such as agriculture and manufacturing, at more rapid rates than in other branches of industry and much of the service sector. Improvements in telecommunications and the development of myriad computerised business services have made it possible for industrial establishments to contract to external firms many business services formerly provided internally, which suggests that the magnitude of increase in the service sector may be somewhat overestimated.

354. The development, production and use of new technologies also cause shifts in the structure of employment by occupation within economic sectors. The electronics industry, for example, is both labour- and skill-intensive. The information sector and other "high-tech" industries, defined as those which manufacture computers, electronic components and other technical devices, currently employ about 15 per cent of the work force in the United States. However, less than 25 per cent of the employment in these industries is in specialised occupations such as computer specialists and engineers, the remainder being engaged in production, distribution and other service occupations.

355. The combined effects of technological developments within industrial categories and shifts in the sectoral composition of output are reflected in changes in the occupational structure of employment for the economy as a whole. In the United States, for example, clerical workers and professional and technical workers increased their share of occupational categories by more than one third between 1960 and 1980 (table 47). Under the assumption of moderate economic growth in the 1990s, there would be little change in the combined share of those two groups, but there would be a significant shift between them, with the share of professional and technical workers increasing by one fourth and that of clerical workers falling by two fifths. By the year 2000, 20 per cent of the labour force is expected to be in the category of professional and technical workers, compared with 11 per cent in 1960 and 16 per cent in 1980.

B. New and emerging technologies

356. The development of new technologies and their rate of diffusion among industries and countries is a principal factor behind structural change. The process of innovation by which new technologies create new products or become incorporated in production processes and organisational structures is very much a function of economic variables such as changing patterns of final demand and relative factor prices. At least three areas of technological innovation - micro-electronics and information, new materials and biotechnology, are expected to have an increasing impact on the world economy during the 1990s. 126/

Table 47. Occupational employment trends in the United States, 1900-2000, under two scenarios: moderate economic and moderate technological diffusion a/

(Percentage)

Occupation	1900	1930	1960	1980	1995 b/	Moderate economic growth scenario b/ 2000	Moderate technological diffusion scenario c/ 2000
1. Clerical workers	3	9	15	19	19	20	11
2. Professional and technical workers	4	7	11	16	17	17	20
3. Service workers	9	10	12	13	16	17	15
4. Craft and related workers	11	13	13	13	12	12	15
5. Managerial and related workers	6	7	11	11	10	10	7
6. Operative workers	13	16	18	14	12	9	16
7. Sales workers	5	6	6	6	7	9	7
8. Labourers	12	11	6	5	5	3	6
9. Farm workers	37	21	8	3	2	3	3
Total	100	100	100	100	100	100	100

Sources: 1900-1995: cited in R. W. Rumberger and H. M. Levin, "Forecasting the impact of new technologies on the future job market", Technological Forecasting and Social Change, vol. 27, 1985, p. 409.

2000: Department of International Economic and Social Affairs, based on projections from United States Department of Labor, Bureau of Labor Statistics, Monthly Labor Review, vol. 110 (No. 9), Sept. 1987, p. 47, and W. Leontief and F. Duchin, The Impacts of Automation on Employment, 1963-2000, 1983.

a/ The percentage distributions were computed on the basis of experienced civilian labour force for 1900 and 1930, and of total employed persons for other years.

b/ Based on moderate-trend projections in United States Bureau of Labor Statistics, Monthly Labor Review, 1987, op. cit.

c/ Based on moderate technological diffusion rate scenario in W. Leontief and F. Duchin, op. cit.

1. Micro-electronics and information

357. The growth of the computer and telecommunication industries has been rapid and pervasive. The world demand for telecommunication equipment, as proxied by selected International Standard Industrial Classification categories and measured in constant prices, has been growing at an annual rate of 8 per cent during the 1980s, with faster than average growth occurring in Asia (10 per cent) and less than average growth in Europe (6.7 per cent). Computer equipment and services in the United States and in world markets are expected to grow more rapidly than telecommunication equipment and services for the period from 1985 to 1990, as shown in table 48. Faster growth has been recorded for the semiconductor industry, which produces the key components used in all computerised applications, and which could account for 4 per cent of total world manufacturing output by the year 2000.

Table 48. World and United States market for telecommunication and computer goods and services, 1985-1990

(Percentages) a/

Sectors redefined according to standard industrial classification (SIC)	1985		1990		World annual growth rate (percentage)
	World	United States	World	United States	
Telecommunication equipment (SIC 3661, 36621, 36622)	13	11	11	9	8
Computer equipment (SIC 3573)	19	26	22	27	16
Telecommunication services (SIC 4811, 4821)	58	53	50	42	9
Computer services	10	13	17	22	24
Total: (in per cent)	100	100	100	100	12
(in billions of United States dollars)	498	224	884	394	

Source: Economic Commission for Europe, The Telecommunication Industry Growth and Structural Change, 1987, p. 19.

a/ Percentages are computed based on the value in current United States dollars.

358. Well-known applications include the automation of telecommunications and the linkage of data transmission to computers for analysis (informatics). These applications, together with word processing and the computerisation of many management systems, have transformed finance, banking, business management and public administration. In the past, information systems were used to reduce administrative costs, but recently large companies have begun to use information systems as central components in transmitting technical and economic information among numerous computer systems at various geographical locations. In manufacturing and to some extent in agriculture, many processes have been automated, some requiring highly flexible, self-regulating machines, or "robots", while the engineering industry has been transformed by computer-assisted design with the advent of three-dimensional computerised screen displays.

359. Many technical advances are expected in this automation area in the 1990s, such as the projected trends for the United States in key areas in programmable automation, or computer-integrated manufacturing which has the capability of integrating information processing with physical tasks performed by programmable robots (see table 49).

360. While a few developed market economies continue to be the source of new technologies, a number of countries in Asia and Latin America have developed national electronics industries of some scope, and many more are rapidly introducing computerised technologies in other sectors.

361. The newly-industrialised countries, such as Singapore and the Republic of Korea, have welcomed foreign subsidiaries and joint ventures for the development of consumer-based electronics and electronic components. In the 1990s, the newly-industrialised countries may well catch up with the industrialised countries in the areas of electronics, petrochemicals and steel. 127/ Other developing countries, such as Brazil and India, have been building their informatics industries mainly through nationally-owned enterprises. In many other developing countries the electronics industry remains embryonic, with only some assembly and minor software operations.

Table 49. Projections for key areas in programmable automation in the United States, 1984-2000 and beyond

	1984	1985-1986	1987-1990	1991-2000	2001 and beyond
1. Micro-computer-based workstations computer-aided design (CAD):					
(a) electronics design	+	&	*		
(b) mechanical design		+	&	*	
2. 3-D vision in structured environments for ease of visualization	+ &		*		
3. 3-D vision in unstructured complex environments			+	&	*
4. Flexible manufacturing systems (FMS) for					
(a) cylindrical parts production	+ &			*	
(b) sheet metal parts production	+ &			*	
(c) 3-D mechanical assembly	+			*	
(d) electronics assembly	+ &		*	& *	
5. Standardization of interfaces between wide range of computerized devices in an integrated factory			+	&	*
6. Computerized factories needing only a few people in management, design functions					+

Source: Office of Technology Assessment, Congress of the United States, Computerized Manufacturing Automation: Employment Education, and the Workplace, Washington, D.C., 1984, p. 6.

Note:

\+ Solution in laboratories
& First commercial applications
* Solution widely and easily available (requiring minimal custom engineering for each application).

2. New materials

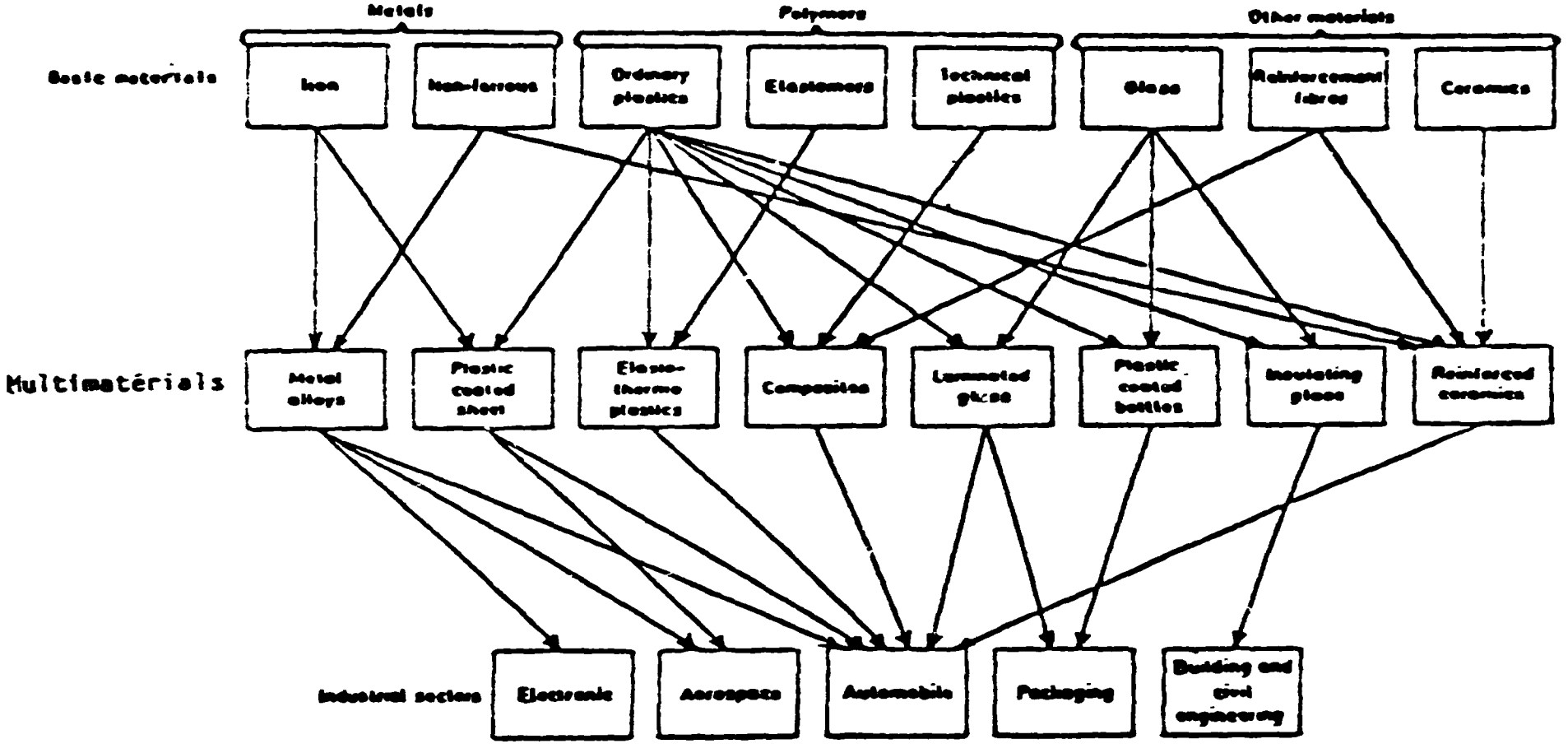
362. During the past three decades, a number of new materials have been developed as research has been directed toward more consistent quality and reliability, improved durability, and ease of processing. These include new metal alloys, plastic-coated metals, elasto-thermo plastics, laminated glass, and fibre-reinforced ceramics (figure 1). Their uses are becoming widespread in electronics, aerospace, automobiles, packaging, building and civil engineering. Estimates of growth in world demand for the period 1985-1990 suggest that the fastest growth is likely to be in ceramics and materials for electronics (tables 50 and 51). Further evidence of the growing importance of new materials is provided by technological developments expected to occur in Japan during the next decade (table 52). New materials technologies and their applications figure prominently on the list.

363. The use of new materials has lowered the raw-material intensity in most industrial sectors superimposed on a shift in final demand away from goods that are raw-material intensive, a phenomenon known as "dematerialisation". The trend of substituting new materials is expected to accelerate as a consequence of the demand for enhanced performance in such industries as electronics, communications, information and data processing, transportation, energy, manufacturing and chemicals. The largest changes are expected to be in the substitution of such materials as ceramics, polymers and composites for metals. Advanced-materials technologies are expected to revolutionise the automobile and aircraft industries in the next decade and beyond. High-performance plastics and ceramics will be increasingly utilised to increase fuel efficiency by using ceramic engines and to reduce the weight of car bodies by using plastics and resin-based composites.

364. It is estimated that the amount of industrial raw materials required to produce one unit of industrial production is now equivalent to only 40 per cent of that required in 1900, and that this declining trend is accelerating. 128/ Depreciation on intangible investments such as software, marketing, research and development is expected to constitute a larger share of the production cost, while that of raw materials and energy expenditures will decline relative to other costs.

365. These trends will reduce the rate of growth of demand for such materials as copper, zinc, tin, bauxite and aluminium. Although some of the developing countries that are low-cost producers will be able to increase their shares in the slowly growing world markets for traditional materials, they will generally face declining real prices. In the production of some new materials such as fibre-reinforced plastics and fibre-reinforced inorganic materials, developing countries may be competitive because of an abundance of the raw materials required and the labour-intensive character of some parts of the production chain. Examples of such possibilities are shown in table 53.

Figure 1. The linkages between basic materials, multimaterials and industrial sectors



Source: J. M. Poutrel, "Advances in material technologies and their economic impact", Bureau d'information et de prévisions economiques (BIPE), paper presented to the United Nations Centre for Science and Technology for Development, 1986.

Table 50. Prospects for new materials in the world market, 1985-1990

Products	Sales in 1985 (Billions of French francs)	Average annual volume growth (1985-1990 percentage)
Ceramics	45	16.1
Materials for electronics	85	12.0
New glass products	25	9.9
Composites (all grades)	70	8.4
Technical plastics	150	7.0
New non-ferrous products	75	3.7
New steel products	340	2.2
Total	790	6.3

Source: J. M. Poutrel, "Advances in material technologies and their economic impact", Bureau d'information et de prévisions economiques (BIPE), paper presented to the United Nations Centre for Science and Technology for Development, 1986.

Table 51. Estimated consumption growth rates of traditional and new materials in Japan, 1983-1990

(Percentage per annum)

Type of material	Consumption growth rate
Traditional materials	
Non-ferrous metals	3
Traditional ceramics	3
Chemicals	3
Metals	2
Textiles	2
Paper	2
Total for traditional materials	3
New materials	
Amorphous metals	42
Composite materials	29
High-temperate ceramics	19
New materials	18
Technical basic materials	14
Carbon fibres	14
High polymer	13
Total for new materials	18

Source: Financial Times, 18 April 1985, p. 7.

Table 52. Forecast of technology development in Japan, 1989-2006

Probable year	Principal innovations with a high expectation of realisation
2006	Forecasting earthquakes within one month
2005 a/	Super conductors with critical temperature of liquified nitrogen (77K)
2004	Means of converting cancerous cells into normal cells
2003 a/	Steel production from nuclear energy
2002 a/	Submersible cargo ships; aircraft and automobiles using hydrogen fuel
2001	Drugs for arteriosclerosis
2000	Large-scale environmental purification technologies
1999	Chemical agents for treating clotted cancer
1998 a/	Direct aluminium refining technology (direct reduction) Earthquak. prediction through sea-bed crust activity
1997 a/	Deep-sea extraction of metallic nodules
a/	Large-scale commercial nuclear fuel reprocessing plant
1996 a/	Engineering laboratory in space Three-dimensional memory devices
1995 a/	Deep-sea (several hundred metres) drilling technologies
a/	Disposal of high-level radioactive wastes by solidification techniques
1994 a/	Super LSI - 10^9 devices per chip
1993 a/	Super computers (high speed devices); high-efficiency thermoelectric conversion
1992 a/	Advanced robots for complex working environments
1991	Long-range meteorological forecasting
1990 a/	Large area amorphous silicon solar cells
1989	Satellite prospecting (minerals, fishing, agricultural)

Source: E. D. Hondros, "Materials: a perspective", ATAS Bulletin, No. 5, Materials Technology and Development, United Nations Centre for Science and Technology for Development, 1988, pp. 3-4.

a/ Related to new materials technology development.

Table 53. Possible scenarios for materials development in Africa

1. Use of coconut pith as filler in furane plastics to replace petroleum-based plastics and metals, especially the rare metals, to reduce the cost and amount of energy used in metal extraction and recycling.

2. Increased research and development work in the application of such abundant metals as iron, aluminium and silicon in place of such metals as copper, nickel, lead, tin, zinc, tungsten, vanadium and silver.

3. Replacement of today's structural steel-skeleton construction techniques in all major buildings with composite-materials construction techniques which could provide equally strong but lighter structures.

4. Substitution of steel, glass, wood and concrete by aluminium.

5. Development of new devices for in-depth exploitation of ocean resources.

6. Massive replacement of steel and concrete bywood and aluminium for primary structural support members in bridges, low and high-rise buildings, commercial aircraft, transportation, furniture, automobiles and ships.

7. Use of ceramic coatings such as graphite, glass silicon, nitride, zirconium oxide, chromium, oride, and a few borides.

8. Increased importance of alumina, beryllia zirconia and magnesia in ceramics.

9. Production of possible commercial porcelain coatings.

Source: A. M. Goka, "Materials technology forecasting", ATAS Bulletin, No. 5, op. cit., p. 107.

3. Biotechnology

366. Biotechnology innovations have already been applied in food and agricultural production, renewable energy, waste recycling, pollution control, and medical treatment. A principal advantage of these innovations is their economical use on a small scale, without large infrastructure requirements, which could facilitate their use in developing countries.

367. Biotechnology and other methods can be utilized to develop new and more valuable types of fish and thus enhance the fishery industry of coastal States, especially in view of the fact that the demand for fish is projected to exceed supply by over 20 million tons annually by the year 2000. Moreover, many coastal States are increasingly reluctant to allow other nations to fish within their Exclusive Economic Zones. Consequently, some countries must rely increasingly on their own waters and on fish farms. For instance, Japan, which obtains about 10 per cent of its total catch from its fish farms, has carried out "biotechnology fish" projects to aid its fish farms, such as the use of cell fusion technology to produce algae that are 350 times more efficient in raising brine shrimp.

368. The potential of biotechnology for increasing agricultural productivity is high. The United States Office of Technology Assessment, for example, expects that by the year 2000, five sixths of the annual increase in agricultural production in the world will result from new biotechnology and other yield increases, while one sixth will be due to the increase in the quantity of land used in production.

369. Growth in commercial output of biotechnology products, such as bio-pharmaceuticals and new chemicals with agricultural applications, is expected to average 9 per cent per year until the year 2000. World sales are expected to be about $20 billion for 1996-2000, compared with $8.5 billion for 1986-1990 (table 54).

Table 54. Projected biotechnology scale-up market

(Millions of United States dollars)

	1986-1990		1991-1995		1996-2000		Average annual growth rate (percentage)
	United States	World	United States	World	United States	World	
Bio-pharmaceuticals	1 410	5 950	2 169	9 155	3 338	14 086	9
Specialty chemicals	410	1 750	631	2 693	971	4 143	9
Agriculture-related	180	800	275	1 231	426	1 894	9
Total	2 000	8 500	3 075	13 079	4 735	20 123	9

Source: Business Communications Company, Inc., cited in European Chemical News, 30 March 1987.

370. The invention and exploitation of tissue culture and other biotechnology procedures by developing countries may result in the displacement of certain products exported by developing countries. The estimates presented in table 55 indicate that new bioengineered products valued at $US 986 million will displace existing products valued at $US 591 million in the United States in 1992.

371. A few developing countries, including Mexico, Thailand, Indonesia, Nigeria and the Philippines have established programmes to actively incorporate biotechnology in certain agricultural and industrial activities. Thailand, for instance, has identified fermentation technology (for production of feed components, single-cell protein, industrial chemicals, etc.) and enzyme technology (for production of antibiotics, sweeteners, etc.) as having a potentially large impact on industry.

Table 55. New bioengineered agricultural products and displacement of existing products in the United States, 1983-1992

(Millions of United States dollars)

Products	1983	1987	1992
New bioengineered products			
Seeds	2	20	436
Fertilisers	..	219	319
Crop protection chemicals	..	134	231
Total	2	373	986
Markets lost			
Fertilisers	..	145	360
Crop protection chemicals	..	67	231
Total	..	212	591

Source: Technology Update, 14 May 1983, cited in United Nations Centre on Transnational Corporations, Transnational Corporations in Biotechnology (United Nations publication, Sales No. E.88.II.A.4), p. 17.

372. Nigeria has conducted substantial research and development work in biotechnology and genetic resources, and has succeeded in developing genetic selection and breeding techniques which have led to the improvement and production of local varieties of crops with higher yields, greater disease and pest resistance and earlier maturation. The Philippines considers its biotechnology programme as the initial step toward an industrialisation strategy which will induce biological transformation of biomass into food, fuel, fertilisers and chemicals. By using crop residues and by-products as raw materials, that country plans to produce liquid fuel and industrial chemicals and to alleviate its dependence on imported oil. Various biotechnology products and processes are considered technically and economically feasible for development in Mexico (see table 56).

Table 56. Estimates of technical and economic feasibility of development of selected biotechnology products and processes in Mexico, 1984-2000

Products and processes	Estimates of technical and economic feasibility		
	1984	1990	2000
Utilisation of marine algae spirulina	T,E	T,E	
Reutilization of excretions	T,E		
Increased digestibility of farm produce and agro-industrial byproducts	T,E	T	
Vitamins	T,E	T,E	T,E
Foliar protein and other concentrates	T	T,E	T,E
Single-cell proteins:			
Agro-industrial byproducts (solids and liquids)	T,E	T,E	T
Molasses	T,E	T,E	T
Methanol	T,E	T,E	T
Others	T,E	T,E	T
Mushroom and fungus production	T,E		
Bone meal and dried blood, meat and/or fish	T,E		
Enzymes (a-amylases, gluco-amylase, lactose, invertase, proteases, pertinase, glucose isomerase, penicillinase, cellulases)	T,E	T,E	T
Proteolytic enzymes of plant origin	T,E		T
Amino acids (lysine, glutamic acid, methionine, tryptopan, and all other essential amino acids)	T,E	T,E	T,E
Protein enrichment of various substances	T		
Biopolymers	T,E		
Production of micro-algae	T		
Production of essential oils		T,E	
Mononucleotides		T	
Processes based on improved and/or genetically constructed rootstalks		T	
Improved production of vitamins, single-cell proteins, biopolymers, fungi, powders, protein concentrates		T,E	
Pigment production		T,E	
Production of alternative feedstock (fermentation of solid base)	T,E	T,E	
Lactic acid		T,E	
Sweeteners (fructose)		E	
Microbe oil		E	
Unconventional new food sources		E	
Immobilised enzymes		T,E	
Synthetic protein			E
Anaerobic digestors for biogas production	T,E		
Biogas reactors		T,E	

Table 56 (continued)

Products and processes	Estimates of technical and economic feasibility		
	1984	1990	2000
Methane production from:			
Sanitary landfills		T,E	
Industrial waste		T,E	
Animal waste	T,E		
Hydrogen production			E
Ethanol production from:			
Sucrose	T,E		
Starch and other unconventional bases		T,E	
Cellulose and agricultural byproducts			T,E
Hydrocarbon production from:			
Rapid-growth plant species		E	T,E
Biochemical combustibl cells		E	T

Source: R. Quintero Ramírez, ed. Perspectivas de la biotecnología en México, Mexico, Javier Barros Sierra Foundation and CONACYT, 1985, pp. 474-475.

Note: T: Development estimated to be technically feasible.
E: Development estimated to be economically feasible.

373. As these examples suggest, biotechnology offers considerable scope to many developing countries for increasing agricultural productivity and for diversifying the structure of their exports.

C. Diffusion process of new technologies

374. The diffusion of new technologies depends upon such factors as expected profitability and risk; the required amounts of applied research, development, and investment; marketing and production capabilities of firms; resource endowments (especially engineering skills); and relative factor prices. The period from invention to innovation (first practical use) to commercial application has been diminishing over time. The time lag is generally shorter for consumer products than for industrial products, as well as for inventions requiring relatively small investment. Imitation lags are usually much shorter than the time required to invent equivalent products or processes, depending on the industry and country and on the cost of imitating a particular product or process. In general, diffusion tends to be more rapid in the United States and Japan than in Western Europe, possibly because of closer links between industry and universities, greater mobility of technologically skilled personnel, and lower barriers to market entry.

375. The transfer of new technologies has been much more rapid among developed countries than from developed to developing countries. Those developing countries with relatively large domestic markets and more open economies tend to experience greater diffusion with shorter time lags.

376. A study of the most useful inventions introduced in the United States during the 1888-1935 period found that the time lag from invention to first commercial success averaged about 14 years during 1888-1913; for the inventions that emerged during 1900-1935, the gestation period was shorter, with a mean of 9 1/2 years. The length of time from the first commercial success to common use was about 11 years for both periods. 129/

377. The time needed to imitate a given product or process is a decreasing function of the resources available. Firms with comparable technological capability monitor closely the changing technology of their competitors and imitate them rapidly. Advances made in communication and transportation technology tend to speed up this process. This shortens the product life cycle significantly and thus tends to discourage firms from engaging in the innovation stage of basic technologies. An analysis of a sample of 48 product innovations introduced during 1960 to 1976 in the chemical, drug, electronics and machinery industries in the United States showed that about 60 per cent of the patented inventions were imitated within four years. 130/ The ratio of imitation time to innovation time averaged about 0.70, and the ratio of imitation cost to innovation cost averaged about 0.65.

378. The time lag between invention and application also appears to vary significantly across industries. Based on a sample of 11 petroleum refining processes and 35 products and processes in other industries, the average time lag was 11 years in the petroleum industry and about 14 years in the others. 131/ Among the other industries, mechanical inventions were found to have the shortest time lags, followed by chemical and pharmaceutical inventions and then electronics. The speed of electronics application is restrained by the requirement of specialised technical knowledge. Certain inventions can be profitably applied only after some changes have occurred in tastes, technology, and factor prices. Also, some inventions deviate substantially from prevalent technology, while others are merely improvements. 132/

379. The diffusion lag also differs among individual countries, depending on policy and institutional environments, technology and organizational capabilities, availability of skilled human resources and different economic climates. New advances in technology tend to spread more rapidly in the United States than in some other developed countries, both through the direct transmission of ideas among universities and industries and through the high mobility of technologically skilled personnel. In addition, lower barriers to entry in United States industries are conducive to this process. In the case of micro-electronics, the imitation lag was estimated to be 0.1 year in the United States, 2.2 years in the United Kingdom of Great Britain and Northern Ireland, 2.7 years in the Federal Republic of Germany and 2.5 years in Japan. 133/

380. The channels of the international transfer of technology have increased significantly since the early 1970s. At present, they may take many forms, which

may be either commercial or non-commercial. 134/ Non-commercial channels, for example, include technical assistance provided by Governments. Commercial transfer of technology is made through a variety of channels such as foreign direct investment, joint ventures, trade in capital goods, licensing of patents or outright purchase of patent rights, subcontracting, and supply of consultancy services. 135/ International transfer of technology has been dominated by private foreign direct investment and inter-firm licensing. Foreign direct investment in developing countries, however, declined somewhat in the early 1980s due to the poor economic climate. Despite its sluggishness, 136/ foreign direct investment is expected to continue its important role in this arena, but joint ventures and licensing are increasingly preferred 137/ and are expected to rise more rapidly than foreign direct investment.

381. In this context, the future strategy of transnational corporations will continue to have a dominant impact on the transfer of technology. A major portion (about 80 to 90 per cent) of the technologies transferred to developing countries in the past have been made through transnational corporations, in the form of foreign direct investment, licensing and other means. Their decisions on technology transfer depend on the prospects for profit, which take into consideration relative factor costs and local resource structure (low-cost labour and natural resources), transport cost, size of the local market, host Government's policies and regulations, (tariffs, taxes and other incentives), and perhaps more importantly, the product life cycle. Recently, transnational corporations have expanded their operations in information-intensive services (banking and finance, in particular), the bulk of which is concentrated in developed countries. Recently, the number of countries from which the transnational corporations have been supplying technology to developing countries has increased. The share of transnational corporations resident in Japan and Europe has increased in the recent past, while that in the United States has decreased.

382. Several of the more advanced developing countries (India, Brazil, Argentina, Republic of Korea and Taiwan, Province of China, in particular) have emerged as increasingly important exporters of capital goods in the past decade, augmenting sources of technology for other less advanced developing countries. Also, the availability of more diverse forms and sources of transfer is expected to help developing countries to import technology at lower prices and with greater flexibility in "unbundling" the technology package.

383. Creation of a domestic technological capacity - through appropriate skill formation and enhancement of research and development capabilities and technologies for monitoring and disseminating information on new technologies - is an important, though costly, policy pursued by an increasing number of developing countries. Complementary efforts to improve technology import policies, with a preference for licensing agreements and "unbundling" of the technology package, might be more cost-effective.

D. Structural changes in world manufacturing

384. There have been substantial structural changes in world manufacturing during the period 1965-1985, and several of the trends which were characteristic of this period are expected to continue during the decade of the 1990s. The salient trends, described more fully below, are the following:

(a) The share of manufacturing value-added (MVA) in total GDP of the developing countries, which increased substantially during the past two decades, is expected to increase further, from 18.7 per cent in 1985 to about 20 per cent by the year 2000;

(b) The MVA/GDP share in the developed market economies is expected to remain roughly constant at about 26 per cent;

(c) These trends, combined with GDP growth in the developing countries, the centrally planned economies of Eastern Europe and the Soviet Union higher than that in the developed market economies, will lead to further increases in the shares of world MVA accounted for by developing countries and the centrally planned economies (excluding those in Asia), and a corresponding decline in the share of the developed market economies (table 57);

(d) Within the manufacturing sector itself, the share of the consumer goods sector has been falling and that of capital goods increasing, in both developed and developing market economies, but the size of this shift has been much greater in the developing countries (table 58);

(e) At a more detailed sectoral level, the shares of textile and wearing apparel in total MVA have been falling in developing countries and are expected to continue to do so (table 59). None the less, their share in world-wide production of these products is expected to continue to increase;

(f) In the developed market economies, further declines are expected in the relative importance of textile and wearing apparel, footware, petroleum refining, and iron and steel;

(g) In the developing countries, there are very large differences among groups of countries; a small group of major exporters of manufactures accounts for the largest portion of the changes mentioned above;

(h) Comparing the group of major exporters of manufactures with another group of countries with relatively large manufacturing sectors shows that, whereas the MVA/GDP share in the latter group had been higher in 1965, the situation had been reversed in 1986, and the share of MVA/GDP in the major exporters of manufacturing is expected to continue to increase more rapidly than in the other groups throughout the decade of the 1990s.

Table 57. Shares of major country groups in world value-added manufacturing and its branches, 1965-2000 a/

(Percentage)

Branch and country group	1965	1975	1985	1986	1990	1995	2000
Total Manufacturing b/							
Developing countries	9	11	12	13	14	15	16
Developed market	77	69	66	65	63	61	59
Centrally planned c/	14	20	22	22	23	24	25
World total	100	100	100	100	100	100	100
Consumer goods b/							
Developing countries	13	15	16	17	18	19	20
Developed market	69	62	60	59	57	54	51
Centrally planned c/	18	23	24	24	25	27	29
World total	100	100	100	100	100	100	100
Capital goods b/							
Developing countries	5	7	8	8	9	10	11
Developed market	85	76	72	71	69	68	66
Centrally planned c/	10	16	20	21	22	22	23
World total	100	100	100	100	100	100	100
Intermediate goods b/							
Developing countries	10	13	17	17	19	21	23
Developed market	74	66	62	61	58	56	53
Centrally planned c/	16	20	21	22	22	23	23
World total	100	100	100	100	100	100	100

Source: Department of International Economic and Social Affairs, based on data supplied by United Nations Industrial Development Organization.

(Footnotes on following page)

(Footnotes to table 57)

a/ Shares may not add to 100 per cent because of rounding.

b/ Total manufacturing comprises consumer, capital and intermediate goods defined by International Standard Industrial Classification categories as the following:

Consumer goods consist of food products (311), beverages (313), tobacco products (314), textiles (321), wearing apparel (322), leather and fur products (323), footwear (324), wood and wood products (331), furniture and fixtures (332), paper and paper products (341), printing and publishing (342), and other manufacturing industries (390).

Intermediate goods consist of industrial chemicals (351), other chemical products (352), petroleum refineries (353), miscellaneous petroleum and coal products (354), rubber products (355), plastic products (356), pottery, china and earthenware (361), glass and glass products (362), and other non-metal mineral products (369).

Capital goods consist of iron and steel (371), non-ferrous metals (372), metal products (381), non-electrical machinery (382), electrical machinery (383), transport equipment (384), and professional scientific equipment (385).

c/ Centrally planned economies, which include those of Eastern Europe and the USSR.

Table 58. Branch share of disaggregate manufacturing value added, by major country group, 1966-2000 a/

(Percentage)

Country group and branch	1966-1970	1976-1980	1981-1985	1985	1990	2000
Developing countries						
Total manufacturing b/	100	100	100	100	100	100
Consumer goods	58	49	47	46	43	38
Capital goods	23	28	28	29	30	33
Intermediate goods	19	23	25	25	26	28
Developed market economies						
Total manufacturing b/	100	100	100	100	100	100
Consumer goods	36	33	33	32	31	28
Capital goods	48	49	49	51	51	54
Intermediate goods	16	18	18	18	18	18
Centrally planned economies c/						
Total manufacturing b/	100	100	100	100	100	100
Consumer goods	50	43	40	39	38	38
Capital goods	32	38	41	43	44	44
Intermediate goods	18	19	19	19	19	19

Source: Department of International Economic and Social Affairs, based on data supplied by United Nations Industrial Development Organisation.

(Footnotes on following page)

(Footnotes to table 58)

a/ Shares may not add to 100 per cent because of rounding.

b/ Total manufacturing comprises consumer, capital and intermediate goods defined by International Standard Industrial Classification categories as the following:

Consumer goods consist of food products (311), beverages (313), tobacco products (314), textiles (321), wearing apparel (322), leather and fur products (323), footwear (324), wood and wood products (331), furniture and fixtures (332), paper and paper products (341), printing and publishing (342), and other manufacturing industries (390).

Intermediate goods consist of industrial chemicals (351), other chemical products (352), petroleum refineries (353), miscellaneous petroleum and coal products (354), rubber products (355), plastic products (356), pottery, china and earthenware (361), glass and glass products (362), and other non-metal mineral products (369).

Capital goods consist of iron and steel (371), non-ferrous metals (372), metal products (381), non-electrical machinery (382), electrical machinery (383), transport equipment (384), and professional scientific equipment (385).

c/ Centrally planned economies, which include those of Eastern Europe and the USSR.

Table 59. Shares of selected industries in total manufacturing value added, by developing countries and their subgroups, and developed market economies, 1966-2000 a/

(Percentage)

Industry	Developing countries					
	1966-1970	1976-1980	1981-1985	1985	1990	2000
Food (311)	18	15	16	16	15	13
Textile and wearing apparel (321 and 322)	20	15	14	13	12	11
Footwear (324)	2	1	1	1	1	1
Industrial chemicals (351)	2	4	4	5	5	6
Other chemical products (352)	4	5	5	5	6	6
Petroleum refineries (353)	4	5	5	5	5	6
Rubber products (355)	2	2	2	2	2	2
Iron and steel (371)	5	5	5	5	6	6
Non-ferrous metal (372)	2	2	2	2	2	2
Metal products (381)	5	5	5	5	4	4
Non-electrical machinery (382)	3	5	5	5	5	5
Electrical machinery (383)	3	5	6	6	7	9
Transport equipment (384)	5	6	6	6	6	6

Industry	Major exporters of manufacturing					
	1966-1970	1976-1980	1981-1985	1985	1990	2000
Food (311)	12	12	11	11	11	9
Textile and wearing apparel (321 and 322)	24	17	14	14	13	11
Footwear (324)	2	1	1	1	1	1
Industrial chemicals (351)	2	4	5	5	6	7
Other chemical products (352)	3	4	5	5	5	6
Petroleum refineries (353)	2	2	2	2	2	1
Rubber products (355)	1	2	2	2	2	2
Iron and steel (371)	5	6	6	7	7	7
Non-ferrous metal (372)	1	1	1	2	2	2
Metal products (381)	5	5	5	5	5	5
Non-electrical machinery (382)	5	8	7	7	7	7
Electrical machinery (383)	5	7	8	9	10	13
Transport equipment (384)	5	6	6	6	7	7

Table 59 (continued)

Industry	Other countries with relatively large manufacturing sectors					
	1966-1970	1976-1980	1981-1985	1985	1990	2000
Food (311)	21	19	21	21	21	21
Textile and wearing apparel (321 and 322)	16	10	12	11	11	10
Footwear (324)	2	1	1	1	1	1
Industrial chemicals (351)	3	4	5	5	6	6
Other chemical products (352)	4	5	6	6	7	7
Petroleum refineries (353)	3	3	4	4	4	4
Rubber products (355)	2	2	2	2	2	2
Iron and steel (371)	4	5	5	5	5	6
Non-ferrous metal (372)	2	2	2	2	2	3
Metal products (381)	5	5	5	4	4	4
Non-electrical machinery (382)	3	4	4	3	3	3
Electrical machinery (383)	3	4	4	4	4	5
Transport equipment (384)	5	6	6	5	5	6

Industry	Oil exporters b/					
	1966-1970	1976-1980	1981-1985	1985	1990	2000
Food (311)	17	14	14	13	12	10
Textile and wearing apparel (321 and 322)	16	15	14	14	14	13
Footwear (324)	1	1	1	1	1	1
Industrial chemicals (351)	1	1	1	1	1	1
Other chemical products (352)	4	5	5	5	5	5
Petroleum refineries (353)	19	19	20	21	21	24
Rubber products (355)	2	1	1	1	1	1
Iron and steel (371)	3	3	3	3	3	3
Non-ferrous metal (372)	3	1	1	1	1	1
Metal products (381)	3	4	4	3	3	3
Non-electrical machinery (382)	1	2	2	2	2	2
Electrical machinery (383)	1	3	3	3	4	5
Transport equipment (384)	3	6	5	5	5	4

Table 59 (continued)

Industry	Other primary commodity exporters					
	1966-1970	1976-1980	1981-1985	1985	1990	2000
Food (311)	25	24	26	26	24	20
Textile and wearing apparel (321 and 322)	23	22	14	13	12	11
Footwear (324)	2	2	2	2	1	1
Industrial chemicals (351)	1	2	2	2	3	3
Other chemical products (352)	4	5	5	5	5	5
Petroleum refineries (353)	4	5	6	7	8	10
Rubber products (355)	1	1	1	1	1	2
Iron and steel (371)	1	1	1	1	1	1
Non-ferrous metal (372)	1	1	2	2	2	2
Metal products (381)	3	4	4	4	4	4
Non-electrical machinery (382)	1	1	1	1	0	0
Electrical machinery (383)	1	2	2	2	2	3
Transport equipment (384)	2	2	3	2	2	3

Industry	Least developed countries					
	1966-1970	1976-1980	1981-1985	1985	1990	2000
Food (311)	12	13	13	11	11	12
Textile and wearing apparel (321 and 322)	40	33	31	30	27	24
Footwear (324)	1	2	2	2	2	2
Industrial chemicals (351)	5	5	6	8	8	7
Other chemical products (352)	4	6	7	8	8	8
Petroleum refineries (353)	2	2	1	1	1	1
Rubber products (355)	1	1	1	1	1	2
Iron and steel (371)	5	7	6	6	6	5
Non-ferrous metal (372)	0	0	0	0	0	0
Metal products (381)	2	2	2	2	3	4
Non-electrical machinery (382)	1	0	1	1	1	1
Electrical machinery (383)	1	2	2	3	3	2
Transport equipment (384)	2	3	2	2	2	2

Table 59 (concluded)

Industry	Developed market economies					
	1966-1970	1976-1980	1981-1985	1985	1990	2000
Food (311)	9	9	9	9	9	8
Textile and wearing apparel (321 and 322)	8	7	6	6	5	4
Footwear (324)	1	1	1	1	0	0
Industrial chemicals (351)	4	5	5	5	5	5
Other chemical products (352)	3	4	4	4	4	4
Petroleum refineries (353)	2	2	2	2	1	1
Rubber products (355)	1	1	1	1	1	1
Iron and steel (371)	8	7	6	5	5	4
Non-ferrous metal (372)	2	2	2	2	2	2
Metal products (381)	7	7	7	6	6	5
Non-electrical machinery (382)	11	11	12	12	12	13
Electrical machinery (383)	7	8	10	12	14	18
Transport equipment (384)	11	11	11	11	11	11

Source: Department of International Economic and Social Affairs of the United Nations Secretariat, based on data from the United Nations Industrial Development Organization.

a/ The shares of the selected industries in total manufacturing do not add to 100 per cent because those of other industries are not shown.

b/ Excluding high-income oil exporters (see explanatory notes) for lack of comprehensive data.

385. The factors giving rise to these changes are complex. In the statistical analysis undertaken to prepare the projections reported in this chapter, the behaviour of 29 categories of manufactures in 75 countries over the period from 1965 to 1986 was studied. A large portion of the variation in behaviour was associated with such variables as per capita GDP, country size, and proxies for export concentration and the general stance of trade policies. Other studies have come to similar conclusions regarding the importance of such factors 138/ but have also found that world-wide improvements in transportation and telecommunications have increased the scope for policy in accelerating industrialization in countries with export-led growth strategies. The pattern of the future structural change in manufacturing is thus expected to exhibit considerable variation among country groups.

386. The overall change in the composition of the manufacturing sector in the developed market economies is expected to be smaller than in the developing countries. Since industrial structures have converged to a considerable extent

during the post-war period, 139/ technological innovations in intra-branch specialization are expected to dominate their further structural change. The main thrust of their industrial transformation is expected to come from the high-technology industries and the enhancement of the high-technology content of the traditional industries. In particular, progress in micro-electronics technologies and their widespread application to the whole range of capital goods, intermediate goods and consumer durables (especially through their contribution to the development of information technologies) is expected to play a key role. Developed market economies are expected to sustain their comparative advantage in the high-technology and knowledge-intensive industries, including micro-electronics, large computers, semiconductors, robots, telecommunication, new materials, biotechnology, and segments of the micro-chemicals industry (such as medicines).

387. Thus, the capital goods industries of developed market economies, which contain a high percentage of high-technology items, are projected to grow more rapidly than other industries and to sustain their predominant position in their manufacturing sector, increasing their share in MVA to 54 per cent in the year 2000 compared with 49 per cent in 1981-1985 (table 58). They are expected to show a somewhat accelerated annual average growth rate of 3.6 per cent in the period from 1991 to 2000, 140/ compared with 2.4 per cent between 1981 and 1986. Sustained, albeit moderate, growth in industrial activities, and continuing restructuring efforts in the 1990s are likely to require more investment activities and thus create additional demand for capital goods. Electrical machinery, non-electrical machinery (especially those related to automation) and professional and scientific equipment are expected to grow faster than total manufacturing output, and their shares in total manufacturing are expected to increase (table 59). Sub-branches related to electronics are expected to show the highest growth and make the most significant contribution to growth of manufacturing output. 141/ Electrical machinery, non-electrical machinery and transport equipment would continue to account for the largest shares of total manufacturing output (18, 13 and 11 per cent, respectively, in the year 2000 compared with 10, 12 and 11 per cent, respectively, in the period from 1981 to 1985).

388. The developed market economies, however, are expected to experience further loss of relative competitiveness in some categories of capital goods and intermediate goods, such as general purpose machinery, iron and steel, metal products, home electronics, small computers, some types of semiconductors, automobiles, and shipbuilding, most of which are well within the medium-technology range into which the more advanced developing countries are expanding. Although this process will be attenuated by the impact of automation on reducing unit costs of production, growth in these industries in the developed market economies is expected to be slow, leading to a further decline in their relative shares. 142/

389. The share of the consumer goods industries in total MVA in the developed market economies is expected to continue to decline, to 28 per cent by the year 2000 compared with 33 per cent on average in the period from 1981 to 1985. The relative importance of food, leather and footwear, textiles and wearing apparel, which are mostly labour-intensive or produced by standard technology, are expected to decline. Food processing, however, will remain a major industry, retaining a share of 8 per cent in the year 2000 compared with 9 per cent on average between 1981 and 1985.

390. The share of intermediate goods industries in total MVA in the developed market economies is expected to remain at its 1981-1985 average of 18 per cent through the year 2000. The shares of industrial chemicals, other chemical products, and plastic products are expected to maintain their current shares. Some intermediate goods industries, however, are expected to experience a relative decline because of the development of substitute materials and new technologies that conserve intermediate inputs.

391. In the past two decades, the differentiation among developing countries has been increasing with respect to the evolution of their manufacturing sectors. The major exporters of manufactures became competitive relative to the developed market economies in an increasing number of heavy industries; other developing countries with relatively large manufacturing sectors have improved their competitiveness in light industries, while the least developed countries remained stagnant. In the next decade, the most rapid growth in manufacturing is expected to be concentrated in the countries which already are major exporters of manufactures and in other developing countries with relatively large manufacturing sectors. The industrial structures of the countries in the former group have been evolving away from light manufacturing industries to technologically more sophisticated and skill-intensive heavy industries. Most of these countries are already capable of supplying capital goods to other developing countries, and their industrial structures are expected to closely resemble those of the developed market economies by the year 2000. Other developing countries with relatively large manufacturing sectors are expected to develop more diversified manufacturing sectors and to increase their world market shares in simple, labour-intensive industries at the expense of major exporters of manufacturing goods.

392. Consumer goods industries in the developing countries are expected to continue to account for the largest share of total manufacturing value-added; although declining to 38 per cent by the year 2000 from 47 per cent on average in 1981-1985, their share would still be larger than the shares of capital goods or intermediate goods. Food and textiles and wearing apparel would continue to be the two largest industrial branches, accounting for 13 and 11 per cent of the manufacturing sector, respectively, in the year 2000. Countries with low per capita income are still at an early stage of import substitution, producing mainly light consumer goods such as processed food, textiles and wearing apparel and footwear. In the least developed countries, for instance, the shares in MVA of textiles and wearing apparel, food and footwear were 31, 13 and 2 per cent respectively, in 1981-1985 compared with 14, 11 and 1 per cent, respectively, in the countries classified as major exporters of manufacturing. These large differences in the structure of manufacturing among groups of developing countries are expected to persist through the year 2000 (table 59).

393. The share of the capital goods industries in total MVA of the developing countries is expected to continue to increase, from 28 per cent on average in 1981-1985 to 33 per cent in the year 2000, reflecting an expected annual growth rate of 6.5 per cent of the capital goods industries in the 1990s. Developing countries as a whole are projected to account for 11.3 per cent of world production of capital goods in the year 2000, compared with 8.1 per cent in 1986 and 4.9 per cent in 1965. Virtually the entire range of capital goods industries (iron

and steel, non-electrical and electrical machinery, and transport equipment) are expected to show higher growth rates than total manufacturing output.

394. The share of intermediate goods in MVA in the developing countries is projected to increase slightly, from 25 per cent on average in 1981-1985 to 28 per cent in the year 2000. Industrial chemicals and other chemicals sectors are expected to grow somewhat more rapidly than other intermediate goods sectors. Petroleum refining is projected to increase from 5 per cent of total MVA in 1981-1985 to 6 per cent in the year 2000.

395. Among the subgroups of developing countries, structural change has been most pronounced in the major exporters of manufactures. They have established, or are in the process of introducing, industries of an intermediate technological level, such as petrochemicals, segments of microchemicals, automobiles, general purpose machinery, electrical machinery, home electronics, and precision tools and equipment. They are also in the process of entering some advanced industries such as semiconductors, small computers, automated office equipment, optic fibres, telecommunications and pharmaceuticals. They are expected to become competitive in more of these industries and to increase their exports. The future of these industries, however, is more uncertain than in the past, as the life cycles of products have been shortened significantly due to rapid technological innovation and diffusion. These countries thus face intensifying competition from developed countries and each other as well as from other developing countries with large manufacturing sectors.

396. Some developing countries with large manufacturing sectors have already made significant advances in labor-intensive and other industries embodying standard technologies, such as textiles, food, footwear, cement, steel and petrochemicals, and are competing with the major exporters of manufactures in limited export markets. In response, the latter are accelerating a shift in the structure of manufacturing towards technologically more advanced industries or higher quality segments of the traditional industries, such as high-quality and fashion textiles, specialized ships, micro-chemicals, specialty steels, industrial electronics and electrical machinery. Recently, some of the Asian newly-industrialized countries have been increasing their investment in other countries in the region in order to redeploy their declining industries or to secure natural resources. Some of the major exporters of manufactures have begun to reorient their economies towards producing for their domestic markets and further diversifying their exports.

397. The share of the capital goods industries in total MVA of the major exporters of manufactures has increased rapidly, from an average of 26 per cent in 1966-1970 to 35 per cent in 1981-1985, while that of their consumer goods industries declined substantially from 59 to 43 per cent. In the baseline projections, this trend is expected to continue in the year 2000, the share of capital goods reaching 42 per cent and the share of consumer goods falling to 32 per cent (table 60). Their capital goods industries are projected to grow at an annual average of 7.2 per cent during 1991-2000, which is higher than for the developing countries as a whole. The share of the intermediate goods industries in total MVA in these countries is also projected to increase, from 22 per cent on average in 1981-1985 to 26 per cent in the year 2000. Within the capital goods industries, electrical

Table 60. Branch shares of total manufacturing value added by subgroup of developing countries, 1966-2000 a/

(Percentage)

Country group and branch	1966-1970	1976-1980	1981-1985	1985	1990	2000
Major exporters of manufacturing						
Total manufacturing b/	100	100	100	100	100	100
Consumer goods	59	46	43	41	38	32
Capital goods	26	34	35	37	38	42
Intermediate goods	15	20	22	22	24	26
Other countries with relatively large manufacturing sectors						
Total manufacturing b/	100	100	100	100	100	100
Consumer goods	58	50	50	51	49	47
Capital goods	23	27	26	25	25	27
Intermediate goods	19	23	24	25	26	26
Oil exporters c/						
Total manufacturing b/	100	100	100	100	100	100
Consumer goods	50	46	46	45	44	40
Capital goods	15	19	18	18	18	18
Intermediate goods	35	35	36	37	38	42
Other primary commodity exporters						
Total manufacturing b/	100	100	100	100	100	100
Consumer goods	76	72	66	65	63	57
Capital goods	9	11	12	12	12	13
Intermediate goods	16	18	22	23	25	30
Least developed countries						
Total manufacturing b/	100	100	100	100	100	100
Consumer goods	76	69	68	64	63	63
Capital goods	11	14	13	14	14	15
Intermediate goods	14	16	19	22	23	22

Source: Department of International Economic and Social Affairs of the United Nations Secretariat, based on data from the United Nations Industrial Development Organisation.

(Footnotes on following page)

(Footnotes to table 60)

a/ Shares may not add to 100 per cent because of rounding.

b/ Total manufacturing comprises consumer, capital and intermediate goods defined by International Standard Industrial Classification categories as the following:

Consumer goods consist of food products (311), beverages (313), tobacco products (314), textiles (321), wearing apparel (322), leather and fur products (323), footwear (324), wood and wood products (331), furniture and fixtures (332), paper and paper products (341), printing and publishing (342) and other manufacturing industries (390).

Intermediate goods consist of industrial chemicals (351), other chemical products (352), petroleum refineries (353), miscellaneous petroleum and coal products (354), rubber products (355), plastic products (356), pottery, china and earthenware (361), glass and glass products (362) and other non-metal mineral products (369).

Capital goods consist of iron and steel (371), non-ferrous metals (372), metal products (381), non-electrical machinery (382), electrical machinery (383), transport equipment (384) and professional scientific equipment (385).

c/ Excluding high-income oil exporters (see explanatory notes) for lack of comprehensive data.

machinery, non-electrical machinery and transport equipment are expected to grow faster than total manufacturing output, and their shares in total manufacturing output are expected to increase significantly in these countries by the year 2000. Their consumer goods industries, on the other hand, are expected to grow slower than their total manufacturing output. The shares of food and of textiles and wearing apparel, for example, are projected to decrease from 11 and 14 per cent, respectively, on average in 1981-1985 to 9 and 11 per cent in 2000. Industrial chemicals and other chemical products, which constitute a major share in the production of intermediate goods, are projected to grow significantly faster than total manufacturing output, and their shares will consequently increase. As these shares evolve in the 1990s, the structure of manufacturing in the major exporters of manufactures will become much more like that of developed market economies by the year 2000.

398. Although the major exporters of manufactures have become more diversified and balanced than other developing countries and have secured international competitiveness in many traditional industries such as textiles, iron and steel, consumer electronics and transport equipment, their overall industrial base is still rather fragile and unbalanced, compared with the developed market economies. Many of their industries rely extensively on the fabrication and processing of imported parts and materials. The industries producing intermediate inputs have lagged far behind. Due to these imbalances, a considerable part of the potential backward linkages have been lost to developed-market economies and their industrial structures have remained highly import-dependent. This has been a basic cause of chronic trade deficits in some of these countries in the past. To reduce import dependency and improve their trade balances as well as to build a more balanced and complete industrial base, these developing countries are expected to intensify their efforts to develop industries producing parts and materials and more sophisticated machinery.

399. As noted earlier, the group of other developing countries with relatively large manufacturing sectors are expected to improve their comparative advantage in light consumer-goods industries, such as textiles and apparel and rubber products as well as in segments of heavy industries, which are based on low-cost labour, natural resources and/or intermediate technology, such as ship-building, iron and steel, metal products and petroleum refining. Many developing countries in this group are expected to experience a rapid expansion of their domestic market and an acceleration of their industrial transformation as they accumulate capital and technological knowledge. They are likely to become able to develop more industries requiring large economies of scale, and many of them are likely to follow in the steps of the major exporters of manufacturing goods; some may achieve the degree of success of the major exporters of manufactures in the past decades. Taking advantage of the wage increases in most of the major exporters of manufactures, the "catch-up behaviour" of many of these countries has been accelerating recently.

400. The industrial structure of the other developing countries with relatively large manufacturing sector has already shown significant change during the past two decades, but less than that of the major exporters of manufactures. The share of capital goods in total MVA of this subgroup increased from 23 per cent on average in the period 1966-1970 to 26 per cent in 1981-1985, while the share of consumer goods fell from 58 per cent to 50 per cent (table 60). The share of intermediate

goods also increased, from 19 to 24 per cent. The share of their capital goods industries is projected to remain virtually constant, at 27 per cent in the year 2000, while their consumer goods industries will decline further to 47 per cent and their intermediate goods industries will increase further to 26 per cent. These changes, however, mask significant variance among the countries within this subgroup. Malaysia, Pakistan and Thailand have shown much more dynamism in their industrialization, while Colombia, Guatemala, Nicaragua and Zambia have shown very minor structural changes or suffered reverses. These divergent trends are expected to continue through the year 2000.

401. In the group of countries exporting mainly primary commodities, change in the manufacturing sector has lagged behind that in other developing countries in the same income range. As a result, most of them have a narrow and skewed industrial base. Their intermediate goods sector increased from 16 per cent of the total MVA in 1966-1970, to 22 per cent on average in 1981-1985, while their consumer goods industries decreased from 76 to 66 per cent. The share of their capital goods sector increased modestly from 9 per cent in 1966-1970 to 12 per cent in 1981-1985. Owing to expected sluggish overall economic activity and the continuing inroads of substituting new materials, the long-term prospects for global demand for primary commodities and thus their export earnings continue to be poor. Thus, with limited prospects for foreign exchange to finance imported capital goods, rapid industrialization in most of these countries is unlikely. However, there is an increasing tendency for these countries to expand the domestic processing of their primary commodities, especially petrochemicals, iron and steel and other raw-material-based industries, including metals, wood pulp and bulk chemicals. Some of these countries may, however, skip the stage of exporting labour-intensive goods and move directly to exports of goods of higher technological content. 143/

402. In the least developed countries, industrialization has not progressed markedly in the recent past due mainly to poor agricultural output and severe balance-of-payments constraints, which have restricted imports of essential raw materials and spare parts and prevented timely replacement of machinery. Their manufacturing sector remains very small relative to their agricultural sector; its growth is projected to be much slower than in other developing countries at an annual rate of 1.5 per cent on average in 1991-2000, compared with 5.6 per cent in the developing countries as a whole (tables 61 and 62). The agricultural sector will continue to have significant effects on their manufacturing industries, as a market for manufacturing goods and as a supplier of raw materials.

403. Reflecting the slow growth of manufacturing output, the industrial structures of the least developed countries are expected to change little in the 1990s. Their consumer goods industries are expected to continue to account for the dominant share of MVA, 63 per cent in the year 2000, which is a slight decline from 68 per cent on average in 1981-1985, while the capital goods industries are expected to account for 15 per cent in the year 2000, a very slight increase from 13 per cent in 1981-1985. The share of intermediate goods industries is expected to show a moderate increase, from 19 per cent in 1981-1985 to 22 per cent in the year 2000. Their industries are generally resource-based; industries processing their raw materials or substituting imports, such as food processing, beverages, tobacco, textiles and wearing apparel, constitute a major share of their manufacturing output.

Table 61. Growth rates of value-added manufacturing and its branches, by major country group, 1966-2000

(Percentage)

Country group and branch	1966-1970	1971-1975	1976-1980	1981-1985	1981-1986	1988-1990	1991-1995	1996-2000
Developing countries								
Total manufacturing a/	6.5	6.3	5.2	3.2	4.0	5.0	5.4	5.7
Consumer goods	4.8	4.3	3.7	2.5	3.1	3.9	4.2	4.4
Capital goods	8.6	9.5	6.5	3.6	4.5	6.1	6.4	6.6
Intermediate goods	9.1	7.2	6.8	4.2	4.9	5.7	6.1	6.5
Developed market economies								
Total manufacturing a/	5.0	1.5	2.5	2.1	1.9	2.3	3.1	3.1
Consumer goods	3.3	1.0	1.6	1.3	1.2	1.6	2.2	2.1
Capital goods	5.4	1.8	3.0	2.7	2.4	2.6	3.6	3.6
Intermediate goods	7.2	1.9	2.7	1.9	1.9	2.5	3.1	3.1
Centrally planned economies b/								
Total manufacturing a/	8.2	7.5	4.5	4.1	4.3	4.6	4.6	4.6
Consumer goods	7.1	5.6	3.0	2.9	3.1	..	..	..
Capital goods	9.4	9.7	6.4	5.3	5.4	..	..	..
Intermediate goods	8.8	8.1	3.6	4.0	4.2	..	..	..

Source: Department of International Economic and Social Affairs of the United Nations Secretariat, based on data from the United Nations Industrial Development Organization.

a/ Total manufacturing comprises consumer, capital and intermediate goods defined by ISIC (International Standard Industrial Classification) categories as the following:

Consumer goods consist of food products (311), beverages (313), tobacco products (314), textiles (321), wearing apparel (322), leather and fur products (323), footwear (324), wood and wood products (331), furniture and fixtures (332), paper and paper products (341), printing and publishing (342), and other manufacturing industries (390).

Intermediate goods consist of industrial chemicals (351), other chemical products (352), petroleum refineries (353), miscellaneous petroleum and coal products (354), rubber products (355), plastic products (356), pottery, china and earthenware (361), glass and glass products (362), and other non-metal mineral products (369).

Capital goods consist of: iron and steel (371), non-ferrous metals (372), metal products (381), non-electrical machinery (382), electrical machinery (383), transport equipment (384), and professional scientific equipment (385).

b/ Centrally planned economies, which include those of Eastern Europe and the USSR.

Table 62. Growth rates of value-added manufacturing and its branches, by subgroup, of developing countries, 1966-2000

(Percentage)

Country group and branch	1966-1970	1971-1975	1976-1980	1981-1985	1981-1986	1988-1990	1991-1995	1996-2000
Major exporters of manufactures								
Total manufacturing a/	6.4	8.2	6.4	4.2	5.4	6.1	6.1	6.2
Consumer goods	4.8	5.6	4.2	2.7	3.8	4.7	4.4	4.4
Capital goods	9.3	11.9	8.1	5.7	6.9	6.9	7.1	7.2
Intermediate goods	11.0	9.0	8.6	4.9	6.2	7.1	7.1	7.0
Other countries with relatively large manufacturing sectors								
Total manufacturing a/	6.0	4.4	3.8	1.6	2.0	3.8	4.2	4.7
Consumer goods	4.2	2.8	2.9	1.8	2.1	3.1	3.6	4.0
Capital goods	7.9	6.6	4.7	0.07	0.7	4.9	5.0	5.5
Intermediate goods	8.7	5.9	4.5	2.6	3.0	4.3	4.6	5.1
Oil exporters b/								
Total manufacturing a/	7.5	8.2	7.2	5.6	5.6	4.8	6.0	6.4
Consumer goods	7.8	6.7	6.6	5.3	5.2	4.2	5.3	5.4
Capital goods	8.9	14.1	5.6	5.3	5.5	5.2	6.0	6.0
Intermediate goods	6.5	7.6	8.8	6.0	6.1	5.4	6.9	7.7
Other primary commodity exporters								
Total manufacturing a/	7.5	4.7	-1.2	-0.03	0.3	1.6	3.1	3.4
Consumer goods	5.6	4.5	-3.0	-0.7	-0.3	0.6	2.2	2.4
Capital goods	18.0	3.4	3.1	-0.4	-0.04	2.3	3.8	4.0
Intermediate goods	11.9	5.7	3.2	2.2	2.2	3.6	5.0	5.2
Least developed countries								
Total manufacturing a/	5.5	3.7	3.2	0.2	-0.1	1.2	1.4	1.5
Consumer goods	5.2	2.0	3.0	-1.4	-1.6	1.4	1.5	1.6
Capital goods	6.2	7.8	5.6	0.8	0.4	1.3	1.6	2.1
Intermediate goods	6.5	8.6	2.1	5.4	4.6	0.8	0.9	1.1

Source: Department of International Economic and Social Affairs of the United Nations Secretariat, based on data from the United Nations Industrial Development Organization.

(Footnotes on following page)

(Footnotes to table 62)

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a/ Total manufacturing comprises consumer, capital and intermediate goods defined by International Standard Industrial Classification categories as the following:

Consumer goods consist of food products (311), beverages (313), tobacco products (314), textiles (321), wearing apparel (322), leather and fur products (323), footwear (324), wood and wood products (331), furniture and fixtures (332), paper and paper products (341), printing and publishing (342), and other manufacturing industries (390).

Intermediate goods consist of industrial chemicals (351), other chemical products (352), petroleum refineries (353), miscellaneous petroleum and coal products (354), rubber products (355), plastic products (356), pottery, china and earthenware (361), glass and glass products (362), and other non-metal mineral products (369).

Capital goods consist of iron and steel (371), non-ferrous metals (372), metal products (381), non-electrical machinery (382), electrical machinery (383), transport equipment (384), and professional scientific equipment (385).

b/ Excluding high-income oil exporters (see explanatory notes) for lack of comprehensive data.

404. In the sub-Saharan countries, very slow growth in MVA has been recorded since the mid-1970s. During the first half of the 1980s, aggregate demand was adversely affected by a number of factors, including severe drought. Consequently, many countries in the region are attempting to reorient their industrial base to emphasise small- and medium-scale industries to meet the domestic demand for necessities. Thus, the share of light consumer goods industries in total MVA is expected to increase somewhat during the 1990s.

E. World trade in non-fuel primary commodities

405. Despite the considerable diversification in the exports of developing countries mentioned earlier, many of them continue to depend on a relatively small number of primary commodities. The long-term prospects for some of these primary commodities, such as food and tropical beverages, are determined mainly by the evolution of final demand but also by the development of substitutes (e.g. artificial sweeteners and imitation cocoa butter) and by agricultural protectionism. The shift in demand towards services in the developed market economies has reduced the use of raw materials relative to gross domestic product, and new technologies tend to reduce the raw-material intensity of production and to develop synthetic substitutes, as was discussed above in section B.

406. Combined with the prospect of generally slow growth in gross domestic product for the developed market economies, these factors imply relatively slow growth of world consumption for most primary commodities. The World Bank has projected an average growth rate for world consumption of non-fuel primary commodities to the year 2000 of only about 2 per cent (table 63). Growth of world demand for food, especially cereals and fats and oils, is expected to be about 4 per cent, but demand for sugar and tropical beverages is expected to grow only 1.4 per cent per year. Prospects for textile fibres are for higher-than-average growth, but growth in world import demand for rubber, metals and minerals is anticipated to be only about 1 per cent. 144/

407. During the decade of the 1970s and the first half of the 1980s, the growth rate of production of non-fuel primary commodities in the developing countries (3 per cent per annum) was about twice that in the industrialised countries and centrally planned economies (1.6 and 1.5 per cent per annum, respectively). During the decade of the 1990s, some reduction in the growth rate of production in all regions is expected. Developing countries are expected, however, to continue to achieve substantially higher growth rates of production than other world regions.

408. One consequence of these differential production rates is that developing countries would continue to increase their share in world production of non-fuel primary commodities. Their share increased from an average of 49 per cent during the period 1969-1971 to 53 per cent during the period 1984-1986 and is projected to reach about 56 per cent by the year 2000.

Table 63. Trends in non-fuel primary commodity production, 1969-2000

(Millions of 1985 United States dollars)

Region	Growth rates			Shares in world total		
	1969-1971 1979-1981	1979-1981 1984-1986	1984-1986 2000	1969-1971	1984-1986	2000
Developing countries	2.3	-3.9	2.3	49.0	52.9	55.8
Developed market	0.6	-3.8	1.5	36.2	33.2	31.2
Centrally planned economies a/	0.3	-2.9	1.5	14.8	13.9	13.0
World	1.4	-3.7	2.0	100.0	100.0	100.0

Source: World Bank, Price prospects for major primary commodities, (Report No. 814/86) October 1986, vol. I, tables 24 and 25.

a/ Centrally planned economies of Eastern Europe and the Union of Soviet Socialist Republics.

409. Competition for increased shares in the world market by developing countries with debt-servicing problems is expected to be intense and is likely to result in much greater growth in export volume than in export earnings. A shift in market shares is highly probable in the absence of increased protectionism, but this can only be expected to occur as falling prices eliminate higher cost producers, mainly in the developed market economy countries. Thus, the purchasing power of primary commodity exports of the developing countries almost certainly will grow more slowly than export volumes.

VIII. CONCLUDING OBSERVATIONS

410. All attempts to look into the future run into fundamental problems. First, what will happen depends very greatly on human decisions. If the trends indicated by present evidence are not acceptable, Governments and individuals will try to change them. The purpose of perspective studies is not so much that of forecasting as that of changing the future in directions that are considered necessary or desirable.

411. Secondly, as in the 1970s and 1980s, unforeseeable developments are quite likely to put their stamp on the world economy in the 1990s, for better or for worse.

412. Thirdly, the impact of many of the most important processes of change currently under way in the world economy is difficult or impossible to incorporate into a quantitative assessment of the future of the world economy. They will significantly modify many of the traditional relationships and linkages on which models of the world economy are based, but the timing and magnitude of such effects are difficult to capture even in alternative scenarios. Some of them have been referred to above, but others have not, and this preliminary overview of the socio-economic perspective would not be complete without a reminder of some of the most important ones:

(a) A greater measure of financial and monetary stability in the world economy would reduce the uncertainty which presently discourages much investment or directs it into undesirable channels. For many countries in Latin America and Africa, it will make a decisive difference whether their paralyzing debt problems are unwound at an early or a late stage in the 1990s;

(b) Should genuine progress on disarmament result from a lessening of political tensions, extensive resources would be released for civilian uses. In the world as a whole, military expenditures account for 5 to 6 per cent of the output, but this understates their economic impact as the development of new weapons systems absorbs a large share of the highly skilled manpower in research and puts great strains on government resources. In view of the fiscal constraints facing countries at all stages of development and the climate of hope arising from progress in negotiations on nuclear arms reductions, the share of output devoted to military expenditure in the most powerful countries is more likely to decline than to increase. Debt problems and other economic difficulties have already made for slower growth of military spending in developing countries. Such spending is often out of all proportion to development programmes, but substantial reductions will depend on progress in finding political solutions to perceived security problems;

(c) The international trading system is liable to undergo important changes in the medium term. It cannot yet be predicted what progress will be made in the Uruguay Round on such major issues as roll-backs of protectionist measures, trade in services, and the dismantling of agricultural subsidies, but the outcome will affect the world economy in the next decade. Significant progress towards the realization of an internal market in the European Community can be expected by 1992, and the implementation of the free trade agreement between the United States

and Canada will also affect global prospects. Both developments raise apprehensions among non-participants, but if protectionism in world-wide trade is contained or reversed they will be of benefit to all. Economic reforms under way in China and the Soviet Union and Eastern Europe aim not only at major domestic reform but also at new patterns of international economic relations. Trade between centrally planned economies and market economies has always fallen far short of potential. If these trading relations are gradually opened up in the years to come, gains from trade and from an improved international division of labour would accelerate world growth;

(d) The reform of fiscal systems is on the agenda all over the world, chiefly because they have grown too complex to remain workable. In an increasingly internationalized world economy, there is also a need for international harmonization if unanticipated distortions in flows of investments are to be avoided;

(e) Technological change in a broad sense is the mainspring of economic growth. Its impact is not smooth and gradual; occasionally breakthroughs occur which take a long time to absorb. So it has been with the electronics revolution currently transforming the world system of production, communication, finance and transportation. This revolution may for some time have displaced more jobs than it created, and in what seems like a paradox, it has coincided with the recent retardation of economic growth. But the historical experience of similar breakthroughs suggests that this will be reversed when the new technology has been absorbed and its contributions to productivity have been reflected in overall growth. The 1990s may therefore become a decade of considerably faster growth than presently expected. Similarly, apprehensions about the impact of new technology on developing countries should be balanced against the opportunities that it holds out to them;

(f) The internationalization of the world economy has been going on for a very long time, but it is only in recent years that technological advances in communication and transportation have created a global community not even dreamed of when the United Nations was born. The full implications of the pressure from an increasingly global conception of major investments and economic operations are yet to be seen, and it is difficult at this stage to assess its impact on growth and development in the next decade;

(g) Development does not occur in a social and political vacuum. Profound social change accompanies any transformation in the way that people acquire their livelihood, and is frequently disruptive. The role of the family as a core unit of social organization is strained and traditional values are challenged. Cultural and religious factors which hinder modernization sometimes reassert themselves with great force. The status of women is in a state of unprecedented global review. The continued increase in the large numbers living in poverty and those in need of adequate food, shelter, education and health services generates pressures for more rapid social progress. The immediacy of world-wide information about national events has created a new dimension of politics. The violation of human rights is no longer seen as a purely domestic affair. Political systems are in transition: a trend towards decentralization and wider popular participation is tempered by

concerns about political stability. The outlook for the 1990s depends not only on economic but also on political and social progress;

(h) The implications of the need for sustainable development may become clearer in the course of the next decade. So far, the environmental concerns facing the world community stem mostly from alarming evidence that past and present methods of production inflict serious and sometimes irreparable damage on the ecological system and the biosphere on which the human community depends for its survival. Far less is known about how to guide economic and social progress through channels which will reduce such damage and make it possible to leave the world with better prospects for the future in 2000 than in 1990.

413. These examples clearly imply that the outlook for the next decade depends vitally on the progress made both in national policy-making and in international co-operation. It is impossible to look forward to the 1990s without the impression that the confrontation between the forces making for an internationalization of the world economy and those which seek to retain a measure of national and local autonomy will be intensified and have to find new solutions and compromises. The future of the world economy has not been decided, and no study can reveal it. There are limits to the possible, but tney are wide. At one extreme, there is the spectre of stagnation and environmental disaster. At the other extreme, there are opportunities for relieving poverty, improving the quality of life, safeguarding the environment for future generations, stabilizing the world economy, and moving towards a global community. Neither perspective can be dismissed as impossible. The world's actual course in the vast gulf between them will be decided by how Governments meet the challenges facing them.

Notes

1/ E/1988/62.

2/ These are reported on in more detail in World Economic Survey 1988 (United Nations publication, Sales No. E.88.II.C.1).

3/ For an analysis of the prospects of developing countries in Latin America and the Caribbean through 1992, see Economic Commission for Latin America and the Caribbean, "Restrictions on sustained development in Latin America and the Caribbean and the requisites for overcoming them" (LC/G.1488 (SESS.22(3) Rev.1)), of 9 February 1988. For the five-year period 1988-1992, ECLAC estimated that GDP growth in the region would be only 2.9 per cent per year in the absence of an easing of the internal and external obstacles to growth.

4/ For an evaluation of the prospects for countries in the ECE region to the year 2000, see Economic Commission for Europe, "Overall Economic Perspective to the Year 2000", United Nations publication, Sales No. E.88.II.E.4. The baseline projections for developed market economies for the periods 1991-2000 prepared by the ECE were very close to those presented in table 4. North America, 2.6; European market economies, 2.5; centrally planned economies of Europe, 4.0; other developed economies, 3.8.

Notes (continued)

5/ For technical reasons, the projections assume that bilateral trade shares would remain constant in value terms and thus do not take into account the ability of some developing countries to increase market shares or displace domestic producers, thereby causing import elasticities to increase in the developed market economies.

6/ See sect. VII for more details on commodity prices.

7/ For a description of an earlier version of the global econometric model, see United Nations Department of International Economic and Social Affairs, "The Global Econometric Model of the United Nations Secretariat", PPS/QIR/12/Rev.1, December 1985 (mimeograph). The present version differs from the earlier one principally in two respects: Incremental capital-output ratios have not been normalized by numbers of active persons, and trade has been projected for four categories of imported goods with exports determined by means of trade matrices.

8/ For a description, see UNCTAD/ST/MFD/5, 19 June 1987 (mimeograph).

9/ For a description, see Akira Onishi, "Economics of global interdependence: A report to the United Nations" (mimeograph), September 1986.

10/ World Population Trends and Policies: 1987 Monitoring Report (United Nations publication, Sales No. E.88.XIII.3).

11/ This would suggest that the convention of dividing the developing countries into two groups - China and all the other developing countries - that was occasionally adopted in the discussion of global strategies for development, may no longer be relevant.

12/ The term "least developed countries" refers here to 34 countries with 326 million people in 1980; seven others had 889,000; the 34 are those for which labour force participation rates are available.

13/ Hobcraft, J., J. McDonald and S. Rutstein (1984), "Socio-Economic Factors in Infant and Child Mortality: a Cross-National Comparison", in Population Studies, vol. 38, No. 2.

14/ Based on multivariate analysis of an index of child mortality (ratio of the number of child deaths to the "expected" number of dead children), as reported in Caldwell, J. C. and P. F. McDonald (1981), "Influence of Maternal Education on Infant and Child Mortality: Levels and Causes", in International Population Conference, Manila, 1981: Solicited Papers, Liège, International Union for the Scientific Study of Population, vol. 2, pp. 79-96 and in Socio-Economic Differentials in Child Mortality in Developing Countries (United Nations publication, Sales No. E.85.XIII.7).

15/ Hobcraft, J., J. McDonald and S. Rutstein (1983), "Child-Spacing Effects on Infant and Early Child Mortality", in Population Index, vol. 49, No. 4.

Notes (continued)

16/ World Population Prospects - Estimates and Projections as assessed in 1984 (United Nations publication, Sales No. E.86.XIII.3), p. 9.

17/ World Population Trends and Policies: 1987 Monitoring Report (United Nations publication, Sales No. E.88.XIII.3).

18/ World Population Trends and Policies: 1989 Monitoring Report, to be issued as a United Nations publication.

19/ Department of International Economic and Social Affairs. Fertility Behaviour in the Context of Development: Evidence from the World Fertility Survey (United Nations publication, Sales No. E.86.XIII.5.

20/ Improvements in child survival generate various distinct but closely interdependent types of changes in patterns of reproduction, which typically result in lower fertility levels. Several of these, in particular, "the physiological effect", which links a child's death with a shortening of birth intervals through its effect on lactational amenorrhea and the "replacement effect", which links a child's death to birth spacing and fertility through the interruption of family planning, are rather modest in magnitude, resulting in a maximum in 300 to 500 fewer births for every 1,000 fewer child deaths.

21/ ST/ESA/SER.R/74, Family Building by Fate or Design: a Study of Relationships between Child Survival and Fertility.

22/ World Population Prospects - Estimates and Projections as assessed in 1984, op. cit., p. 10.

23/ Ibid., annex II.

24/ "Global trends and prospects of aging population structures", in Economic and Social Implications of Population Aging. Proceedings of the Tokyo Symposium on Population Structure, to be issued as a United Nations publication.

25/ International Labour Office, Economically Active Population 1950-2025, vol. V, Geneva, 1986.

26/ The Prospects of World Urbanization, Revised as of 1984-1985 (United Nations publication, Sales No. E.87.XIII.3).

27/ Ibid., p. 23.

28/ Op. cit. (United Nations publication, Sales No. E.88.XIII.3).

29/ Denis Maillat, "Long-term aspects of international migration flows. The Experience of European receiving countries" in The Future of Migration, Organisation for Economic Co-operation and Development (Paris), p. 40.

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30/ World Population Trends, Population and Development Interrelations and Population Policies, 1983 Monitoring Report (United Nations publication, Sales No. E.84.XIII.10), vol. I, p. 220.

31/ J. S. Birks, I. J. Seccombe and C. A. Sinclair, "Migrant Workers in the Arab Gulf: The Impact of Declining Oil Revenues", in International Migration Review, vol. 20, winter 1986, pp. 799-814.

32/ Ibid., p. 813.

33/ See, for instance, W. R. Böhning, Studies in International Labour Migration (London, 1984) and E. MacLean Petras, "Economic consequences of migration and return" in D. Kubat (ed.), The Politics of Return. International Return Migration in Europe, Center for Migration Studies (New York); and J. S. Birks and C. A. Sinclair, "Egypt: A frustrated labor exporter?", The Middle East Journal, vol. 33, No. 3 (Summer, 1979), pp. 288-303.

34/ See Entsinger, H. (1978), "Return migration from West European to Mediterranean countries", World Employment Programme Research Working Papers, No. 23, ILO (Geneva) and Papademetriou, D. G. (1984), "Return to the Mediterranean Littoral: Policy Agendas" in Kubat, D. (ed.), The Politics of Return. International Return Migration in Europe, Center for Migration Studies (New York).

35/ World Population Prospects - Estimates and Projections as assessed in 1984, New York, 1986 (United Nations publication, Sales No. E.86.XIII.3), pp. 10-11.

36/ The estimated number of the global refugee population is based on figures provided by Governments according to their own records and methods of estimation. See Refugees, No. 35, November, Office of the United Nations High Commissioner for Refugees, Geneva.

37/ United Nations Research Institute for Social Development "Survey of the Social and Economic Conditions of Afghan Refugees in Pakistan", by Hanne Christensen and Wolf Scott, working paper edition, Geneva, 1987.

38/ See, for example, Harold E. Wachman, "Energy efficiency in the developing countries" (paper presented at the fourth session of the Technical Energy Group of the Task Force on Long-term Development Objectives of the Administrative Committee on Co-ordination, New York, 13-15 December 1982), p. 3. Also, Mohamed-Tahar Tabté and Gary Brennend, "Energy Indicators", OPEC Review, winter 1987, pp. 357-362.

39/ Oil consumption growth rates were computed on the basis of data published in Yearbook of World Energy Statistics (United Nations publication, ous issues) and Secretariat estimates. GDP growth rates were based on Secretariat data and estimates in 1980 United States dollars.

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40/ Fereidun Fesharaki, Lisa Totto, T. Milo Johnson and David T. Isaak, "Future domestic demand for petroleum products in OPEC countries", supplement to Middle East Economic Survey, vol. XXV, No. 37, 28 June 1982, p. 4.

41/ The distinction between "energy intensity" and "energy efficiency" should be noted. The former is concerned with the amount of energy utilised per unit of output in a particular employment; the latter is concerned with the (correct) absolute amount of energy used in that employment. The rate of employment of energy that minimises energy intensity is not the rate that maximises the value contribution of energy (i.e., achieves energy efficiency). Moreover, re-establishment of efficient energy employment following a price rise does not necessarily imply a decline in energy intensity. Nevertheless, it seems likely that adjustments towards efficient energy allocation after such a rise would lead to a lower energy intensity. Thus, a reduction in the energy intensity of aggregate output, following an energy price rise, can probably be taken as prima facie, if not conclusive, evidence of movement toward efficient energy employment.

42/ Economic Commission for Europe, Overall Economic Perspective to the Year 2000: Energy Prospects in the ECE Region (Geneva: United Nations, EC.AD./R.36, Energy/R.41, August 1987), p. 7.

43/ Other supply effects would likewise occur outside the central core of large producers. For example, a certain amount of high cost production which had been shut-in at lower prices would be returned to operation, and development of new high cost fields outside of the central core would commence.

44/ Governmental policy directed towards improving energy use efficiency results in a reduction of the elasticity of energy consumption with respect to aggregate income. (For a given rate of growth of energy employed, the lower the elasticity the higher the rate of growth of aggregate income; or, conversely, for a given rate of income growth, the lower the elasticity the lower the rate of growth of energy employed.) Thus, in scenario A, even a lower rate of growth of energy employed (relative to recent history) permits a rate of growth of aggregate income similar to that experienced in recent years. In scenario B, a rate of growth of energy employed similar to that of recent history permits a rate of growth of aggregate income somewhat higher than that of the last few years.

45/ Figures on production of various energy sources given in scenario A are broadly similar to those given in other recent studies which consider a "no policy change" scenario of the future evolution of the global energy sector. Although it is impractical to give figure-by-figure comparisons of scenario A estimates with those which appear elsewhere in the literature, the interested reader may wish to consult generally similar scenarios: World Energy Outlook (Paris: International Energy Agency, 1982); World Energy Outlook (San Francisco, Calif.: Chevron Corporation, October 1987); World Energy Outlook Through 2000 (Wilmington, DE: CONOCO, September 1986; Hossein Tahmassebi, "World Energy Outlook Through 1995", Energy Exploration and Exploitation (Belfast, United Kingdom: Elsevier Applied Science Publishers Ltd., vol. 4, No. 5, 1986), pp. 349-375.

Notes (continued)

46/ Data in this paragraph are drawn from Energy Balances 1970-1985 (Paris: OECD, 1987) and Energy Balances and Electricity Profiles 1984 (New 'ork: United Nations, 1986).

47/ Energy in the Developing Countries (Washington, D.C.: World Bank, August 1980).

48/ A. Köves, "Some Questions of Energy Policy in East European Countries", Acta Oeconomica (vol. 35 (3-4), 1985) p. 347.

49/ Economic Commission for Europe, Overall Economic Perspective to the Year 2000: Energy Prospects in the ECE Region (Geneva: United Nations, EC.AD/R.36, Energy/R.41, August 1987), p. 17.

50/ N. Ryshkov, "Ogosudarstvenom plane ekonomicheskovo u socialnovo gasvitiya SSSR na 1986-1990 godu", Pravda, 20 June 1986.

51/ E/C.7/1985/4, Energy Resources: Trends and Salient Issues, p. 12.

52/ Including tar sands.

53/ Survey of Energy Resources, 1980 (London: World Energy Conference, 1980) part B, appendices, table 2.6.

54/ For a discussion of recent and prospective developments in energy technology, see sect. VII.

55/ World Energy Conference, op. cit., table 2.3.

56/ Leslie Dienes and Theodore Shabad, The Soviet Energy System: Resource Use and Policies (New York: Halsted Press, 1979), chap. 10.

57/ World Commission on Environment and Development, Report of the World Commission on Environment and Development, Our Common Future, Oxford University Press, April 1987, chap. 3, p. 83.

58/ Approximately 1,000 new chemicals are marketed annually, joining the nearly 70,000 existing ones, many of which are toxic or hazardous.

59/ Recognition of this problem has led to progress under the auspices of the United Nations Environment Programme (UNEP) in developing a global convention on the control of transboundary movements of hazardous wastes, which may be placed before Governments for accession in early 1989.

60/ UNEP, Environmental Data Report, Basil Blackwell, 1987, p. 4.

61/ UNEP, The State of the World Environment, 1987, UNEP, Nairobi, [Kenya], April 1987, p. 10.

Notes (continued)

62/ UNEP, Environmental Data Report, Basil Blackwell, 1987, p. 6.

63/ Jill Jaeger, et al, 'Developing policies for responding to climatic change", a report of the discussions and recommendations of the workshops held in Villach (28 September-2 October 1987) and Bellagio (9-13 November 1987) under the auspices of the Beijer Institute, Stockholm, World Meteorological Organization and United Nations Environment Programme (WMO/TD-No. 225), April 1988.

64/ UNEP, The State of the World Environment, 1987, op. cit., p. 14.

65/ United States National Academy or Science estimates. Reported in: Time magazine, "The Heat is On", 19 October 1987, p. 10.

66/ United States Environmental Protection Agency calculations. Reported in ibid. p. 67.

67/ World Bank, "Report: 'Sound Environmental Management Should be Integral Part of Economic Policy-Making'", World Bank News VI (15) (15 April 1987), p. 12.

68/ UNEP, The State of the World Environment, 1987, op. cit., p. 30.

69/ World Bank, "Environment, Growth and Development", World Bank, Washington, D.C., 16 March 1987 (mimeograph), p. 3.

70/ UNEP/G.C.13/4, The State of the World Environment, 1985, Nairobi, Kenya, 1985, p. 4.

71/ About 20 per cent is in manufacturing and 49 per cent in services, plus a large share of the 8 per cent in construction and utilities.

72/ The projected increase will be to about 24 per cent in manufacturing, 48 per cent in services and part of 9 per cent in construction and utilities.

73/ For a more detailed discussion of the issues reviewed in this section, see S/ESA/204, Housing and Economic Adjustment, United Nations publication, Sales No. E.88.IV.1.

74/ By 1980, nearly all dwellings had a kitchen; more than 9 dwellings in 10 had piped water; more than 8 in 10 had a flush toilet; and more than 7 in 10 had a fixed bath or shower. Partly as a result of the cultural and demographic trend towards smaller-sized households, the average number of persons per room fell by 11 per cent, from 0.74 to 0.66, between 1970 and 1980.

75/ For a more detailed discussion of policy options in the centrally planned economies, see Housing and Economic Adjustment, op. cit., pp. 36-38.

Notes (continued)

76/ Permanent housing is defined by the United Nations Statistical Office as dwellings constructed well enough to last for 10 years. Although they do not necessarily have safe water supply or adequate sanitation, in most developing countries the only data collected on a systematic basis are limited to authorised dwelling units that have clear title and comply with zoning regulations and building code standards. Such data tend to exaggerate estimates of housing "deficits" based on the arbitrary distinction between authorised and informal dwellings. The data can provide a limited indication of varying housing conditions and trends in different groups of countries.

77/ As a follow-up to the International Year of Shelter for the Homeless (1987), the General Assembly has called for a global strategy to facilitate adequate shelter for all by the year 2000. Implementation could improve the prospects for individual and social well-being and for the world economy, from the impact of shelter investment.

78/ For an elaboration of the relevance of human resources development to development strategies, see Committee for Development Planning, Human Resource Development: A Neglected Dimension of Development Strategy (United Nations publication, Sales No. E.88.II.A.11).

79/ Report of the ACC Task Force on Long-term Development Objectives on its fifteenth session, New York, 8-10 September 1987, ACC/1987/14, para. 67.

80/ Ibid., para. 69.

81/ The social return to expansion of primary education in agrarian societies depends largely on its effects on the productivity of peasant farmers. The evidence suggests that this in turn depends on whether farmers are operating in a traditional or a modernizing environment - that is, one in which change is rapid. Education assists farmers to obtain and evaluate information about improved technology and new economic opportunities, and thus to innovate. The level of education required depends on the levels of technology currently in use and potentially suitable. Education being complementary to other inputs, its value cannot be assessed in isolation. It depends on the degree of access to credit, extension services, new seeds and other inputs. The greatest impact on rural development can thus be made where education is part of a package of measures. See Committee for Development Planning, Report on the twenty-fourth session, New York, 12-15 April 1988, E/1988/16, para. 98.

82/ Inter-American Development Bank, Economic and Social Progress in Latin America - 1987 report, p. 109.

83/ UNESCO, "A Summary Statistical Review of Education in the World 1970-1984", ED/BIE/CONFINTED 40/Ref. 1, Paris, July 1986, p. 24.

84/ UNESCO, October 1982 computer printout.

Notes (continued)

85/ The gross enrolment rate, or ratio, includes in the numerator children older or younger than those in the denominator, i.e. the number in a country's official age-ranges for different levels of education. Net primary enrolment rates, which exclude underage or overage children from the numerator, tend to be 10 to 20 percentage points lower.

86/ A recent review of enrolment trends and education policies in the least developed countries concluded that "it is clear that, given their other priorities, almost no LDC can afford to press ahead with substantial increases in enrolment at the secondary and tertiary levels of education. (For example) in ... the policy (of) the Central African Republic ... in secondary education the essential requirement is to restore its quality and to begin by limiting enrolment (and) Samoa ... stated that the existing proportion of secondary school places to primary school leavers would be maintained ..." (UNCTAD, The Least Developed Countries - 1985 Report, TD/B/1059, para. 314, p. 107).

87/ UNESCO, Statistical Yearbook 1987, table 3.16.

88/ Ibid., tables 2.2 and 3.11.

89/ ACC/1987/14, op. cit., para. 66.

90/ These figures exclude Nigeria, where per capita expenditure increased from $36.80 in 1970 to $72.34 in 1980; the data available after 1981 exclude non-federal public expenditures, which apparently have been much larger than the federal expenditures.

91/ UNESCO, "A Summary Statistical Review of Education in the World 1970-1984", table 15.

92/ UNESCO, Statistical Yearbook 1987, table 4.2.

93/ The projections tend to be a few percentage points lower than those published by UNESCO, which are based on historical trends but are not specifically related to economic trends.

94/ ACC/1987/14, op. cit., para. 68.

Notes (continued)

95/ Only five least developed countries do not have third-level education, but more than half of their students at this level are in Bangladesh. Their very low third-level enrolment rates may be largely explained by the small size and simplicity of most least developed countries economies, which does not allow for the minimum size of "market" to be attained for many subjects requiring third-level training. Although several least developed countries are making efforts to develop third-level manpower (e.g., creation of a University in Samoa in 1984, rehabilitation of Makerere University in Uganda), this probably should not be considered a high priority for allocation of resources. For a majority of least developed countries, there is a large number of qualified and trained nationals living outside the country, so that a desirable alternative policy option for acquiring the services of high-level manpower is to take steps to attract them back or, at any rate, to try to limit the "brain drain". This is what Uganda, for instance, is attempting through the initiation in 1984 of a TOKTEN ("Transfer of knowledge through expatriate nationals") project sponsored by UNDP. (Adapted from UNCTAD, (op. cit.) TD/B/1059, para. 315, p. 107.)

96/ United Nations Statistical Office national accounts data bank.

97/ E/1988/16, op. cit., para. 99.

98/ Based on UNESCO, "A Summary Statistical Review of Education in the World 1970-1984", op. cit., pp. 47-48.

99/ Ibid., table 17.

100/ Ibid., table 18.

101/ WHO, Maternal Mortality Rates, a Tabulation of Available Information, Second ed., Geneva, 1986.

102/ WHO, Evaluation of the Strategy for Health for all by the Year 2000, Seventh Report on the World Health Situation, Geneva, 1987, p. 73.

103/ Based on WHO, Evaluation of the Strategy for Health for all by the Year 2000, Seventh Report on the World Health Situation, Geneva, 1987, pp. 75-85, and other sources as noted.

104/ UNICEF, State of the World's Children 1988, p. 17.

105/ The New York Times, 9 February 1988.

106/ First Report on the World Nutrition Situation, ACC/SCN, November 1987, p. i.

107/ WHO, Evaluation of the Strategy for Health for all by the Year 2000, Seventh Report on the World Health Situation, Geneva, 1987, (op. cit.) p. 88.

108/ See ACC/1987/14, paras. 56-60.

Notes (continued)

109/ WHO, The International Drinking Water Supply and Sanitation Decade, 1981-1990, CWS Series of Co-operative Action for the Decade, Geneva, September 1987, tables A.3.2.1 and A.3.2.3., pp. 23, 25.

110/ Ibid., tables A.3.2.2 and A.3.2.4, pp. 24, 26.

111/ This goal and its accompanying strategy have been endorsed by the United Nations General Assembly in its resolutions 34/58 of 29 November 1979 and 36/43 of 19 November 1981.

112/ ACC/1987/14, para. 70.

113/ According to estimates made in the early 1980s, which had not been revised as of early 1988.

114/ WHO, The International Drinking Water Supply and Sanitation Decade, op. cit., p. 14.

115/ Based on the baseline scenario of GDP and on country and regional unit costs per capita reported in (WHO) The International Drinking Water Supply and Sanitation Decade, Review of mid-Decade Progress (as at December 1985), CWS series, September 1987.

116/ For more detailed review of these issues, see World Bank, Financing Health Services in Developing Countries, an Agenda for Reform, Washington D.C., 1987. For a review of the effects of user charges, including a case study comparing the fee structures of government and mission health centres in Rwanda, see Donald S. Shepard and Elizabeth F Benjamin, "User Fees and Health Financing in Developing Countries: Mobilizing Financial Resources for Health", in David E. Bell, and Michael R. Reich, eds., Health, Nutrition, and Economic Crises, Approaches to Policy in the Third World, Dover, Massachusetts (United States of America), Auburn House Publishing Co., 1988, pp. 401-424.

117/ For further analysis of goals and estimated costs of the WHO Strategy for Health for All by the Year 2000, see Mahesh Patel, "An Economic Evaluation of 'Health for All'", in Health Policy and Planning (Oxford University Press) vol. I, No. 1, 1986, pp. 37-47.

118/ See Report of the World Conference to Review and Appraise the Achievements of the United Nations Decade for Women: Equality, Development and Peace, Nairobi, 15-26 July 1985 (United Nations publication, Sales No. E.85.IV.10), chap. I, sect. A.

119/ "Aging and Social Expenditure in the Major Industrial Countries, 1988-2025", by Peter S. Heller, Richard Hemming and Peter W. Kohnert, International Monetary Fund, Washington, D.C. (Occasional Paper No. 47), September 1986.

Notes (continued)

120/ "Labour flexibility and older worker marginalisation: the need for a new strategy", Guy Standing, International Labour Review, vol. 125, No. 3, May-June 1986.

121/ For detailed information, see "Measures to assess drug abuse and the health, social and economic consequences of such abuse: summary of information from 21 countries", Bulletin on Narcotics (United Nations publication), vol. 35, No. 3, July-September 1983, pp. 26-31.

122/ Report of the International Conference on Drug Abuse and Illicit Trafficking, Vienna, 17-26 June 1987 (United Nations publication, Sales No. E.87.I.18).

123/ The constant price data are useful in gauging the extent of shifts in the structure of output from the standpoint of the end-user. Because relative prices and sectoral productivity change over time, however, these figures tend to understate the true extent of structural change. In the United States, for example, the proportion of the labour force employed in manufacturing declined from 24 per cent in 1970 to 21 per cent in 1975, and 18 per cent in 1985.

124/ For an extensive discussion of the prospect of world agriculture for the year 2000, see Food and Agriculture Organization of the United Nations, Agriculture: Toward 2000 (C/87/27), July 1987. FAO considers that rates of growth of agricultural production from 1983/85 to the year 2000 under somewhat optimistic assumption could be about 0.9 per cent per annum in the developed market economies, 1.5 per cent per annum in the centrally planned economies of Europe, and 2.8 per cent per year in the developing countries (3.0, including China).

125/ United Nations Conference on Trade and Development (UNCTAD), Handbook of International Trade and Development Statistics, 1987, Supplement (United Nations publication, Sales No. E/F.87.II.D.10).

126/ For a discussion of the impact of science and technology on long-term economic development in the context of ECE member States, see United Nations Economic Commission for Europe, Overall Economic Perspective to the Year 2000, (United Nations publication, Sales No. E.88.II.E.4), chap. VI.

127/ Nomura General Research Institute, cited in Journal of Asian Electronics Union, No.2/1987.

128/ U. Colombo, "The technology revolution and the restructuring of the global economy", in J. H. Muroyama and H. G. Stever (eds.), Globalization of Technology International Perspectives, National Academy Press, Washington, D.C., 1988, p. 26.

129/ S. Colum Gilfillan, "The prediction of technical change", The Review of Economics and Statistics, vol. 34, 1952, pp. 368-385.

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130/ E. Mansfield, Schwartz, M. and Wagner, S., 1981, "Imitation Costs and Patents: An Empirical Study", Economic Journal, 91 (December), pp. 907-918.

131/ J. Enos, "Invention and innovation in the petroleum refining industry", The rate and direction of inventive activity, Princeton, N.J., 1962.

132/ Edwin Mansfield, The economics of technological change, W. W. Norton & Company, Inc., New York, 1968, p. 101.

133/ Gert Lorens, "The diffusion of emerging technologies among industrial countries", in Giersch, Herbert ed., The Diffusion of Emerging Technology among Industrial Countries: Symposium, 1981.

134/ UNCTAD, Trade and Development Report, 1987, (Sales No. E.87.II.D.7), pp. 85-100.

135/ These are not mutually exclusive. There can be a certain overlap among these channels. For instance, foreign direct investment can be combined with licensing agreements.

136/ Total flow of foreign direct investment to developing countries decreased from $15 billion in 1981 to $10 billion in 1983 and $11.5 billion in 1985. The share in world total foreign direct investment decreased from 26 per cent in 1975 to 23 per cent in 1985. Foreign direct investment inflows are also very unevenly distributed among the developing countries. Flows of foreign direct investment tend to be concentrated in those countries that are rich in natural resources, have large domestic markets or abundant supply of skilled but low-cost labour. In 1980-1985, 18 countries and territories accounted for 86 per cent of the flows of foreign direct investment to developing countries as a whole. United Nations Centre on Transnational Corporations, Transnational corporations in world development: Trends and prospects, (United Nations publication, Sales No. E.88.II.A.7), 1988.

137/ The selective technology import policy of developing countries (especially by those that have some technology base) tends to induce unpackaging of the technology components and thus licensing and other more specific technology contracts are expected to rise along with the industrialization of developing countries.

138/ Hollis Chenery, Sherman Robinson and Moshe Syrquin, Industrialization and Growth: a Comparative Study, IBRD, Oxford University Press, 1986. The influence of many of these specific constraints, however, becomes weaker due to rapid technological advances, especially in transportation and communication technologies.

139/ If per capita manufacturing value added is used as a measure of a technological gap, most of the developed countries had caught up with or surpassed the United States by 1986.

Notes (continued)

140/ This, however, is still significantly below the strong annual average rate 5.4 per cent recorded in 1966-1970.

141/ Most of the 29 industries included in this analysis contain heterogenous sub-branches. In several cases, these sub-branches often show opposite trends or no clearly identifiable pattern. For instance, electronic industries are included in the electrical machinery group and are expected to grow more rapidly than the group as a whole.

142/ One UNIDO report shows that through cutbacks of industrial capacity and automation of the entire production process, the United States textile and clothing is gradually recovering some of its lost market shares. Productivity in iron and steel industry and chemical industries have also increased significantly in recent years. The cost differentials still remain substantial in most of the industries involved, however. In the steel industry, for instance, the cost in the United States still remains 20 to 30 per cent higher than in the Republic of Korea and Brazil. In shipbuilding, costs in Japan are more than 60 per cent higher than its neighbouring countries. Cost advantages based on an abundance of intermediate raw materials continue to be important. Developed market economies with abundant natural and energy resources like Australia and Canada expect sufficient growth in industries based on natural resources such as aluminium. United Nations Industrial Development Organisation, Industry and Development Global Report 1987 (United Nations publication, Sales No. E.87.II.B.2).

143/ Colin Bradford and William Branson, eds., Trade and structural change in Pacific Asia, a National Bureau of Economic Research report, the University of Chicago Press, 1987.

144/ These projections incorporated are somewhat higher assumptions regarding world GDP growth than those presented in the baseline projection in section III and may, therefore be somewhat optimistic.
